

PROJECT TITLE: Reducing Greenhouse Gas emissions through Community Forests and Sustainable Biomass Energy	
PROJECT SYMBOL: GCP /AFG/082/GFF	
Recipient Country/ies: Islamic Republic of Afghanistan	
Resource Partner: Global Environment Facility	
FAO project ID: 623884	GEF/LDCF/SCCF Project ID: 5610
Executing Partner(s): National Environmental Protection Authority (NEPA), Ministry of Agriculture, Irrigation and Livestock (MAIL), Ministry of Energy and Water (MEW) and the Ministry of Rural Reconstruction and Development (MRRD), with executional support from BORDA, MADERA, and United Nations Environmental Programme (UNEP)	
Expected EOD (starting date): December 2015	
Expected NTE (End date): December 2018	
Contribution to FAO's Strategic Framework¹	<ul style="list-style-type: none"> • Strategic objective/Organizational Result: SO2: Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner. Organizational Outcomes 1 and 2 • Regional Result/Priority Area: Asia and Pacific Regional Priorities: Regional Priority 3 - Emphasizing equitable productive and sustainable natural resources management and utilization, with special emphasis on genetic resources Regional Priority 5 - Coping with the impact of climate change on agriculture and food and nutritional security, with special emphasis on climate change adaptation and mitigation c. Country Programming Framework Outcome: CPF Priority Area No 4 - Support to better natural resource management CPF Priority Outcomes: 4.1 - Enhanced capacity to improve sustainable environmental management, including in terms of policy-making capacity and information management, and ensure rehabilitation of the natural resource base 4.2 - Enhanced capacity for sustainable development/use of rangelands and forests through community-based approaches 4.3 - Enhanced capacity to respond to climate change on agriculture and food security with mitigation and adaptation measures
GEF Focal Area/LDCF/SCCF: Climate change mitigation	
GEF/LDCF/SCCF Strategic Objectives: CCM-1 Promote the demonstration, deployment, and transfer of innovative low-carbon technologies <ul style="list-style-type: none"> - CCM-1.a Technologies successfully demonstrated, deployed, and transferred - CCM-1.b Enabling policy environment and mechanisms created for technology transfer - CCM-1.c GHG emissions avoided CCM-3 Promote investment in renewable energy technologies <ul style="list-style-type: none"> - CCM-3.a Appropriate policy, legal and regulatory frameworks adopted and enforced - CCM-3.c GHG emissions avoided CCM-5 Promote conservation and enhancement of carbon stocks through sustainable management of land use, land use change, and forestry <ul style="list-style-type: none"> - CCM-5.b Restoration and enhancement of carbon stocks in forests and non-forest lands - CCM-5.c GHG emissions avoided and carbon sequestered 	
Environmental Impact Assessment Category (insert √): C	

Financing Plan: GEF allocation: USD 1,735,160 Co-financing:			
Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	
Implementing agency	FAO	In-kind	1,000,000
NGO	BORDA	In-kind	450,000
NGO	MADERA	In-kind	161,114
Local government	MRRD	In-kind	1,200,000
Local government	MAIL	In-kind	1,000,000
Local government	NEPA	In-kind	500,000
Local government	MEW	In-kind	500,000
Subtotal Co-financing: USD 4,811,114			
Total Budget: USD 6,546,274			
EXECUTIVE SUMMARY <p>The Islamic Republic of Afghanistan is characterised by a heterogeneous landscape, varying widely in altitude, rainfall and ecosystems. Despite the variability between the country's eight bio-geographical zones and 15 ecoregions¹, a common characteristic across all of Afghanistan's 34 provinces is the widespread reliance of household income on livelihoods based on ecosystems and natural resources. However, as a result of multiple socio-economic factors, including the widespread destabilisation and destruction caused by several decades of conflict, Afghanistan has undergone considerable deforestation and ecosystem degradation over the last century. The country's once-extensive forests and woodlands have been considerably diminished as a result of agricultural expansion, logging of timber, overgrazing and harvesting of wood fuel. Consequently, the majority of the country's greenhouse gas (GHG) emissions can be attributed to land use, land use change and forestry sectors (LULUCF). Land cover data indicate an average national deforestation rate of ~1.7% in the period 1993 – 2010, with much faster rates observed at a localised scale within the remaining forested areas. The widespread reliance on woody biomass as the primary domestic fuel of rural households results in further emissions of GHGs, in addition to other negative consequences such as: i) deforestation and environmental degradation; ii) poor health as a result of smoke inhalation; and iii) large financial costs to households for purchasing fuel.</p> <p>This GEF project will focus on: i) promotion of sustainable and efficient approaches for biomass energy use, including adoption of sustainable biomass energy systems (SBES) such as fuel-efficient stoves and anaerobic biogas digesters; ii) building concomitant national and community-level capacities, and iii) supporting the design and implementation of community-based management plans for forests and natural resources. By promoting the establishment of community forests and the use of SBESs, the project will contribute to reducing the rate of land degradation and deforestation, while promoting efficient use of biomass fuel. The project will reduce GHG emissions and therefore generate global benefits through mitigation of climate change effects. Furthermore, a shift from direct burning of animal dung to the use of manure as a feedstock for biogas digesters will: i) reduce methane emissions from agriculture; and ii) increase the availability of animal dung for use as organic fertilizers, thereby supporting increased household agricultural productivity. The efficiency of the technologies and approaches used by the project will be studied scientifically, and lessons learned will be disseminated via a publicly accessible online platform.</p> <p>The project's approach will focus on training, awareness-raising and capacity building for the national</p>			

¹ Biodiversity Profile of Afghanistan: An Output of the National Capacity Needs Self-Assessment for Global Environment Management (NCSA) for Afghanistan, United Nations Environment Programme, Post-Conflict and Disaster Management Branch, June 2008

stakeholders related to natural resource management (NRM) and renewable energy, including communities, government and NGOs. Communities will be provided with support to plan and implement activities within community-based natural resource management (CBNRM) plans and will include multiple activities to support the replication and upscaling of project activities during and beyond the implementation period. Government extension officers will be provided with ongoing mentorship and training by embedded staff from technical service providers. Finally, the activities will prioritise the procurement of national consulting services and NGOs as technical service providers to benefit from the existing national capacity and expertise while investing further in the capacity of skilled Afghan nationals.

The overall project **objective** is *to reduce GHG emissions by promoting community forestry, and removing barriers to sustainable biomass energy, while laying the groundwork for climate change mitigation in Afghanistan.*

This objective will be achieved through four outcomes and associated outputs. The first outcome focuses on the enabling environment for the reduction of GHG through CBNRM and SBESs. Outcome 2 will promote and implement CBNRM through the establishment of Forest Management Committees in two pilot districts in Nangerhar and Parwan provinces. Outcome 3 is focused on the promotion of SBESs, including biogas digesters and efficient woodfuel stoves, in the aforementioned pilot districts. Outcome 4 will focus on awareness-raising, knowledge management and evaluation of the project's impacts. The proposed outcomes of the project are detailed further below.

***Outcome 1:** The CBNRM approach and sustainable biomass energy systems have been mainstreamed into national policies and frameworks for renewable energy and forestry* This outcome is focused on establishing an enabling environment and policy framework to promote the project's main activities at a national level. The project will promote the integration of sustainable biomass energy use integrated with sustainable management of natural resources into the priorities and strategies of line ministries. Outputs include: i) national and sub-national policies and strategies that promote integrated CBNRM and sustainable use of biomass energy; ii) a cross-sectoral national-level working group on sustainable biomass energy is established; iii) a roadmap developed for sustainable biomass energy systems; and iv) a biomass energy information system that collects, analyses, and disseminates data on resources and technologies for sustainable energy production and utilisation.

***Outcome 2:** The CBNRM approach has been incorporated in targeted areas at a district scale* . Under this outcome, the project will assist participating communities in two districts in the Nangerhar and Parwan provinces to establish Forest Management Committees (FMCs) and implement community-based management plans for local forests and natural resources. Outputs include: i) at least 30 representatives of provincial and district-level government in pilot areas trained on CBNRM and SFM; ii) representatives of at least 20 CDCs, in at least two pilot areas, trained on CBNRM and SFM principles; iii) community-based natural resource management plans and community forest plans designed in two pilot areas in Parwan and Nangerhar Provinces. This output aligns with GEF CCM-3 focal area and focuses on the monitored reduction of GHGs as a result of the implementation of improved management of community forests. Community forest and natural-resource management plans will be implemented in at least 24,000 hectares in 2 pilot areas.

***Outcome 3:** Innovative and sustainable biomass energy technologies, tested and deployed in 2 pilot areas.* Under this outcome, the project will demonstrate and promote several approaches to efficient use of biomass energy in Parwan and Nangerhar provinces, in alignment with GEF CCM-1 and CCM-3 focal areas. Main outputs include: i) at least two sustainable biomass energy technologies (SBES) (including household-scale biogas digesters and efficient stoves for cooking and heating) tested and deployed in two pilot areas with a CBNRM approach; and ii) 40 communities trained on the operation and maintenance of piloted SBES, as well as on practical measures to increase availability and efficiency of use of biomass. A targeted estimate of ~2,000 households (~14,000 people) will benefit from distribution of piloted SBESs, resulting in reduced emission of 10,297 tonnes CO₂ equivalent. SBESs will be sold to communities at a partially subsidised price, to be established by CDCs, as an incentive to encourage households to invest in



and adopt SBESs.

This outcome will promote the generation of data and information based on assessments of the technologies demonstrated by the project, while simultaneously building the national technical capacity to promote efficient biomass-based forms of rural energy. Outputs include: i) research findings and appropriate technology innovations on integrated CBNRM and SBES for dissemination among the national and regional research networks, involved policy-makers and the general public; ii) specialised training conducted for at least 15 local engineers, skilled workers and entrepreneurs on the design, construction and marketing of piloted SBES, in each of two pilot provinces in Afghanistan; and iii) at least 15 representatives of provincial planning and governmental agencies trained on planning, promotion and implementation of sustainable biomass energy projects, in each of two pilot provinces in Afghanistan.

Outcome 4: Increased national awareness and promotion of SBES and CBNRM

The outputs under this outcome are focused on knowledge management and communication of the project's outcomes, including terminal evaluation.

The estimated emission reductions during the three year project implementation period are estimated to be ~36,820 tonnes CO₂e. Over a 20 year period, the project's activities will contribute to a total direct reduction of GHG emissions of ~838,267 tonnes CO₂e. Lifetime indirect GHG emissions avoided are estimated as 280,236 (bottom-up) and 120,000 (top-down) tonnes CO₂e.

The project will be carried out over a period of three years and has a total value of US\$6,546,274 of which US\$1,735,160 is GEF resources and US\$4,811,114 is co-financing.

**FAO/GLOBAL ENVIRONMENT FACILITY
PROJECT DOCUMENT**

TABLE OF CONTENTS

GLOSSARY OF ACRONYMS.....	8
SECTION 1 – RELEVANCE (STRATEGIC FIT AND RESULTS ORIENTATION)..	11
1.1 General Context.....	11
1.2 Rationale.....	30
1.3 FAO’s comparative advantages	43
1.4 Participants and other stakeholders	44
1.5 Lessons learned from past and related work, including evaluations.....	48
1.6 Links to national development goals, strategies, plans, policy and legislation, GEF/LDCF/SCCF and FAO’s Strategic Objectives.....	51
SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS.....	56
2.1 PROJECT STRATEGY	56
2.2 PROJECT OBJECTIVES	57
2.3 EXPECTED PROJECT OUTCOMES AND OUTPUTS	57
2.4 GLOBAL ENVIRONMENTAL BENEFITS	73
2.5 COST EFFECTIVENESS.....	77
2.6 INNOVATIVENESS	79
SECTION 3 – FEASIBILITY (FUNDAMENTAL DIMENSIONS FOR HIGH QUALITY DELIVERY).....	80
3.1 ENVIRONMENTAL IMPACT ASSESSMENT	80
3.2 RISK MANAGEMENT	81
3.2.1 Risks and mitigation measures.....	82
SECTION 4 – IMPLEMENTATION AND MANAGEMENT ARRANGEMENTS	87
4.1 INSTITUTIONAL ARRANGEMENTS.....	87
4.2 IMPLEMENTATION ARRANGEMENTS.....	92
4.3 FINANCIAL PLANNING AND MANAGEMENT	99
4.3.1 Financial plan (by component, outputs and co-financier).....	99
4.3.2 GEF inputs	101
4.3.3 Government inputs.....	101
4.3.4 FAO inputs.....	101
4.3.5 Other co-financiers inputs	101
4.4 PROCUREMENT	102
4.5 MONITORING AND REPORTING	103
4.5.1 Oversight and monitoring responsibilities	103
4.5.2 Indicators and information sources	104
4.5.3 Reporting schedule	104
4.5.4 Monitoring and evaluation plan summary	106
4.6 PROVISION FOR EVALUATIONS	107
4.7 COMMUNICATION OF PROJECT RESULTS AND VISIBILITY	108
SECTION 5 – SUSTAINABILITY OF RESULTS.....	109
5.1 SOCIAL SUSTAINABILITY	109
5.2 ENVIRONMENTAL SUSTAINABILITY	110
5.3 FINANCIAL AND ECONOMIC SUSTAINABILITY	111
5.4 SUSTAINABILITY OF CAPACITIES DEVELOPED	111
5.5 APPROPRIATENESS OF TECHNOLOGY INTRODUCED.....	112
REPLICABILITY AND SCALING UP	112
APPENDICES	114
APPENDIX 1: RESULTS MATRIX	115
APPENDIX 2: WORK PLAN (RESULTS BASED).....	131

APPENDIX 3: RESULTS BUDGET	141
APPENDIX 4: RISK MATRIX	146
APPENDIX 5: PROCUREMENT PLAN	147
APPENDIX 6: TERMS OF REFERENCE (TORS).....	148
APPENDIX 7: OVERVIEW OF BIOMASS FUEL USE IN AFGHANISTAN, AND LESSONS LEARNED FROM RELATED INITIATIVES.....	160
7.1 Traditional methods of household heating and cooking	160
7.2 Socioeconomic and environmental impacts of traditional woodfuel use	161
7.3 Approaches to increasing the efficiency of biomass fuel use in Afghanistan households.....	162
7.4 Lessons learned from past and related work, including evaluations	162
APPENDIX 8: ANALYSIS OF LAND USE AND LAND USE CHANGE IN AFGHANISTAN AND PILOT DISTRICTS.....	167
8.1: Classification of land use and land use change in Afghanistan.....	167
8.2 Current patterns of land use and land use change in Afghanistan	167
8.3 Current patterns of land use and land use change in pilot provinces – Nangerhar and Parwan	169
8.3.1 Categorisation of primary forest, woodland and scrub vegetation types in Parwan and Nangerhar	169
8.3.2 Rates of deforestation and land use change in natural vegetation in Parwan and Nangerhar	170
8.3.3 Annual loss of woody biomass and emission of GHGs from land use change in natural vegetation in Parwan and Nangerhar	172
APPENDIX 9: HOUSEHOLD PROFILE AND BIOMASS FUEL USE IN PILOT DISTRICTS	175
9.1.1 Identification of pilot project sites.....	175
9.1.2 Demographic background and population of pilot province and districts...	176
9.1.3 Community engagement in governance and natural resource management	177
9.1.4 Factors to support project implementation.....	178
9.2.1 Results of household surveys	180
9.3 Biomass fuel consumption in pilot areas per capita, per household, per district, per FMC.....	181
9.3.1 Household fuel consumption.....	181
9.3.2 Emissions from biomass fuel use	181
9.4. Appendix Nengarhar Mission Report.....	184
9.5 Appendix Parwan Mission Report	187
APPENDIX 10: APPROACH TO ESTIMATING REDUCTIONS OF GREENHOUSE GAS EMISSIONS AS A RESULT OF PROJECT ACTIVITIES.....	190
10.1 Component 2, Outcome 2: GHG emissions avoided through sustainable forest management (SFM) principles and methods adopted in community forests located in 2 pilot areas	190
10.1.2 Proposed targets for number of communities and spatial area of project activities	190
10.2 Component 3, Outcome 2: GHG emissions avoided through innovative and sustainable biomass energy technologies, tested and deployed in 2 pilot areas. ...	195
APPENDIX 11: REVIEW OF NATIONAL ENERGY AND RENEWABLE ENERGY SECTORS IN AFGHANISTAN	203
APPENDIX 12: SITE SELECTION CRITERIA	216
APPENDIX 13: LISTED NURSERY GROWERS IN NANGERHAR AND PARWAN PROVINCES	218

APPENDIX 14: LETTERS OF CO-FINANCING	227
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GLOSSARY OF ACRONYMS

ACEP	Afghan Clean Energy Project
ADB	Asian Development Bank
AEOs	Assistant Extension Officers
AFOLU	Agriculture, Forest and Other Land Use
ANDS	Afghanistan's National Development Strategy
ANNGO	Afghan National Nursery Growers' Organisation
ANREP	Afghanistan Renewable Energy Policy
ASERD	Afghanistan Sustainable Energy for Rural Development
AWP/B	Annual Work Plan and Budget
BCA	Biogas Consortium of Afghanistan
BED	Biomass Energy Department
BEFS	BioEnergy and Food Security
BH	Budget Holder
BORDA	Bremen Overseas Research and Development Association
CAS	Chinese Academy of Sciences
CBFM	Community-Based Forest Management
CBNRM	Community-Based Natural Resource Management
CCM	Climate Change Mitigation
CCTN	Climate Change and Technology Network
CEO	Chief Executing Officer (GEF)
CDCs	Community Development Councils
CDM	Clean Development Mechanism
CDP	Community Development Plan
CHRDP	Central Highlands Rural Development Programme
CPF	Country Programming Framework
CTA	Chief Technical Advisor
CTCN	Climate Technology Centre and Network
DABS	Da Afghanistan Breshna Sherkat
DAIL	Department of Agriculture, Irrigation and Livestock
DDA	District Development Assemblies
DEX	Direct Execution
DoF	Department of Forestry
EFC	Eastern Forest Complex
EIA	Environmental Impact Assessment
EP	Executing Partner
ERDA	Energy for Rural Development in Afghanistan
ESRA	Energy Supply for Rural Areas
FAD	French Development Agency
FAO	Food and Agriculture Organization of the United Nations
FEBS	Fuel-Efficient Bukhari Stoves
FECS	Fuel-Efficient Cooking Stoves
FMCs	Forest Management Committees
FP	Facilitating Partner
FPMIS	Field Project Management Information System
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEBs	Global Environmental Benefits
GEF	Global Environment Facility
GEFSEC	GEF Secretariat
GHG	Green House Gasses
GIZ	Gesellschaft für Internationale Zusammenarbeit

GoIRA	Government of Islamic Republic of Afghanistan
ICE	Interministerial Commission for Energy
ICS	Improved Cooking Stove
ID	Infrastructure Development
IDP	Internally Displaced Persons
ILGNRM	Improving Livelihoods and Governance through Natural Resource Management
INC	Initial National Communication
IPF	Initiating Participatory Forestry
IW	Inception Workshop
KURE	Kabul University Renewable Energy
LTO	Lead Technical Officer
LTU	Lead Technical Unit
LULUCF	Land Use, Land Use Change and Forestry
MADERA	Mission d'Aide au Developpement des Economies Rurales en Afghanistan
MAIL	Ministry of Agriculture, Irrigation and Livestock
MDGs	Millennium Development Goals
MEAs	Multilateral Environmental Agreements
METTs	Monitoring Evaluation Tracking Tools
MEW	Ministries of Energy and Water
M&E	Monitoring and Evaluation
MHP	Micro-hydro Power
MOEc	Ministry of Economy
MOF	Ministries of Finance
MOSS	Minimum Operational Security Standards
MRDD	Ministry of Reconstruction and Rural Development
MRRD	Ministry of Rural Rehabilitation and Development
MTE	Mid-Term Evaluation
NABDP	National Area-based Development Programme
NAMA	Nationally Appropriate Mitigation Actions
NAPA	National Adaptation Plan of Action
NBSAP	National Biodiversity Strategy and Action Plan for Afghanistan
NCSA	National Capacity Needs Self-Assessment
NEPA	National Environmental Protection Agency
NFMP	National Forestry Management Plan
NGO	Non-Governmental Organisation
NPD	National Project Director
NPIU	National Project Implementation Unit
NPP	National Priority Programme
NPSRM	National Plan for Sustainable Rangeland Management
NRD	Natural Resource Directorate
NREG	Natural Resources and Environment Group
NRM	Natural Resource Management
NSP	National Solidarity Programme
NTFPs	Non-Timber Forest Products
PCC	Provincial Coordinating Committee
PCU	Provincial Coordination Units
PIF	Project Identification Form (GEF)
PIR	Project Implementation Review
PPG	Project Preparation Grant (GEF)
PPR	Project Progress Report
PRA	Participatory Rural Appraisal
PRODOC	Project Document

PSC	Project Steering Committee
PY	Project Year
RAP	Regional Office for Asia Pacific
RECC	Rural Energy Coordination Committee
RED	Renewable Energy Department
REDD+	Reduction of Emission from Deforestation and Forest Degradation
RF	Result-based Framework
RLD	Range Land Department
RREP	Rural Renewable Energy Policy
RREAP	Rural Renewable Energy Action Plan
SAISEM	Strengthened Approach for the Integration of Sustainable Environmental Management
SBES	Sustainable Biomass Energy Systems
SBWEG	Sustainable Biomass Energy Working Group
SFM	Sustainable Forest Management
SREN	Sustainable Renewable Energy Network
STAP	Scientific and Technical Advisory Panel
TCID	Investment Centre Division (FAO)
TL	Team Leader
TOR	Terms of Reference
TSP	Technical Service Provider
TWG	Technical Working Group
USD	United States Dollar
VTC	Vocational Training Centre
VTSSSE	Vocational Training for Small-Scale Entrepreneurs
WCS	Wildlife Conservation Society
WISDOM	Woodfuel Integrated Supply/Demand Overview Mapping

SECTION 1 – RELEVANCE (strategic fit and results orientation)

1.1 General Context

a) General development context related to the project

Afghanistan is located in south-central Asia and is characterised by a heterogeneous landscape, varying widely in altitude, rainfall and ecosystems. Despite the variability between the country's eight bio-geographical zones and 15 ecoregions¹, a common characteristic within all of Afghanistan's 34 provinces is the fundamental importance of ecosystems and natural resources to the livelihoods of ordinary households. As the country ranked 169 out of 188 on the UN's Human Development Index in 2014, natural resource use, in the form of activities such as agriculture, forestry, pastoralism and artisanal mining – contributes up to 80% of the livelihood basis for the people of Afghanistan². Although these activities only contribute ~20% of gross national income, Afghanistan's natural resource base contributes to household employment and income for ~85% of the population³.

However, as a result of multiple socio-economic factors, including the widespread destabilisation and destruction caused by several decades of conflict, Afghanistan has undergone considerable deforestation and ecosystem degradation over the last century. Although the country was formerly characterised by extensive forests – particularly in the forest 'hotspots' of the Eastern Forest Complex (EFC) of the Hindu Kush Mountains, the central mountain range and the Pistachio belt that extends across Badghis and Herat Provinces – these regions are now characterised by widespread environmental degradation and reduced spatial extent of forests. The FAO estimated that at the turn of the 20th Century, 4.5% of total land area was covered by closed canopy forest and a further 48% by open woodlands⁴. Yet, by 2008, just 2.6% of the country could be considered as forest or shrubs⁵. Rangeland is now the largest component of landcover (~46%), while agriculture occupies ~12% of the country's area. As a result of the above trends, Afghanistan's 'Land Use, Land Use Change and Forestry' (LULUCF) sectors are major contributors to the country's emissions of GHGs, particularly as a result of activities such as conversion of forest to other land uses and excessive burning of woodfuel to meet domestic energy needs.

The challenges related to management of forests and natural resources have been severely aggravated by the impacts of decades of conflict. In addition to the negative effects of unsustainable use rate, in certain areas forests were deliberately destroyed to prevent their use as refuges for armed groups⁶. As a result of security challenges, funding shortfalls, infrastructural challenges and other endemic factors, many rural communities have been unable to benefit from governmental support and extension services. Rural populations are generally characterised by low levels of socio-economic development, literacy, access to electricity and public services, such as roads and sewage systems. Consequently, rural populations have remained reliant on natural resource-based livelihoods as a means of daily survival. In the absence of supporting economic activities and infrastructure, majority of rural populations are almost completely reliant on biomass – including firewood, charcoal and other forms of woodfuel, as well as crop residues and livestock dung – to meet domestic demands for energy

¹ Biodiversity Profile of Afghanistan: An Output of the National Capacity Needs Self-Assessment for Global Environment Management (NCSA) for Afghanistan, United Nations Environment Programme, Post-Conflict and Disaster Management Branch, June 2008

² Biodiversity Profile of Afghanistan: An Output of the National Capacity Needs Self-Assessment for Global Environment Management (NCSA) for Afghanistan, United Nations Environment Programme, Post-Conflict and Disaster Management Branch, June 2008

³ Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

⁴ Natural Resource Management and Peace Building in Afghanistan, United Nations Country Team in Afghanistan, United Nations Environment Programme, May 2013

⁵ Land Cover Atlas of the Islamic Republic of Afghanistan, Food and Agricultural Organisation, May 2013

⁶ Natural Resource Management and Peace Building in Afghanistan, United Nations Country Team in Afghanistan, United Nations Environment Programme, May 2013

(discussed further below). However, as a result of the sustained and accelerating exploitation of natural resources, the rate of use of natural resources (such as wood and pasture) has exceeded the replacement capacity of the ecosystems from which they have been derived. As a result, natural resources are degraded by over-use, leading to decreased productivity and household income and resulting in considerable emissions of greenhouse gases (GHGs, discussed in further detail below). Finally, communities are left with no option but to continue with unsustainable natural resource management practices in a ‘vicious circle’ that continues to drive deforestation/degradation while aggravating the existing underlying trends of poverty and limited socio-economic conditions. Management of natural resources in rural areas is also complicated by lack of clarity or inconsistencies in land tenure and custodianship, which is sometimes exploited by influential individuals within local-level governance.

It is anticipated that Afghanistan’s economy will gradually diversify and that certain economic sectors such as services, mining and industry have the potential to become significant contributors to the economy¹. However, at present Afghanistan’s economy is still heavily dependent on agriculture – including both livestock and crop production – primarily undertaken by remote rural communities. This dependency on agriculture is forecast to change as the country stabilises and further develops its economy, but a large proportion of the rural population is likely to remain reliant on agriculture and natural resources for the foreseeable future. In this cycle of unsustainable resource use, poverty and conflict, it is anticipated that environmental degradation will be further exacerbated by climate change impacts. Degraded ecosystems are more vulnerable to extreme climate events such as floods, droughts and heatwaves in comparison to intact forests and rangelands which have the ability to absorb water under wet periods, store it in healthy soils and release it slowly as baseflow into streams and rivers during drier times. As the natural ecosystems are degraded, the impact of extreme events will cause a further stress on the resource base, and accelerate the negative cycle. Households are vulnerable both to effects such as reduced crop yield, but also to extreme events such as floods and landslides. The vulnerability of these communities is further exacerbated by widespread land degradation which has undermined the ecosystem services that underpin natural resource provision.

Despite the underlying challenges to stability and prosperity, there have been significant steps taken towards improving the legitimacy and effectiveness of government, and multiple indicators of social and economic wellbeing have improved. For example, in September 2014, the Government of Islamic Republic of Afghanistan (GoIRA) oversaw the first ever democratic transition of power between Governments. Additionally, the economy has grown at a rate of ~10% over the past decade. Under-five and maternal mortality is falling and enrolment in schools has increased². Between 2002 and 2008, the number of school aged children attending primary and secondary school increased from ~2.6 million to ~6.8 million³. However, governance and service delivery is highly variable between administrative districts because of diverse challenges related to security, accessibility, skills capacity and finances. For example, the rate of enrolment of children in schools varies between provinces and districts from 75% in Kabul to 5% in Uruzgan. GoIRA recognises the urgent need to prioritise socio-economic development and service delivery, particularly to impoverished rural areas. Furthermore, GoIRA has recognised the link between sustainable management of natural resources and the wellbeing of communities and has consequently undertaken to mainstream environmental considerations into all line ministries. Without an increase in livelihood productivity and opportunities in these rural areas, lasting peace will be impossible to achieve as resource stress will drive factional fighting, internal displacement and economic stagnation⁴. As part of the GoIRA’s response, there are

¹ GDP composition by sector: agriculture 20%; industry 25.6%; services 54.4%. Labor force by occupation: agriculture: 78.6%; industry: 5.7%; services: 15.7% (CIA World Factbook 2014)

² Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

³ Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

⁴ Natural Resource Management and Peace Building in Afghanistan, United Nations Country Team in Afghanistan, United Nations Environment Programme, May 2013

multiple national development priorities that address the underlying socio-economic and environmental challenges that contribute to deforestation and GHG emissions from the Agriculture, Forest and Other Land Use (AFOLU) sector.

Community-based natural resource management (CBNRM) is recognised as a potential tool to address deforestation and degradation of forests and rangelands. By decentralising the management of forests and other natural resources to communities, there is increased incentive and capacity to sustainably use these resources. Furthermore, there is increasing interest in the potential role that international carbon market mechanisms – such as financing through REDD+, the Clean Development Mechanism (CDM) and voluntary carbon markets – could contribute to supporting GoIRA's dual goals of addressing climate change and improving the management of natural resources. However, the implementation of the aforementioned concepts – such as CBNRM and forest carbon initiatives – remains relatively limited and isolated because of multiple institutional and technical barriers (described further below).

Afghanistan is a country in transition through a period of near-constant conflict and upheaval, which resulted in devastating effects on governance, infrastructure and economy. Consequently, GoIRA and the assisting international community are faced with tremendous challenges in order to reverse the destruction of the past decades. In response to the above-mentioned challenges, this proposed GEF project aims to promote and implement novel approaches to community-based forestry and natural resource management, integrated with activities to promote household adoption of efficient alternatives to traditional use of biomass energy. This GEF project will approach the challenge of mitigating climate change in Afghanistan by promoting technologies and activities that reduce GHG emissions while generating multiple economic, social and environmental benefits. Field-based demonstration activities will be supported by complementary investments in training and capacity-building, providing institutional support to guide decision-making, and ongoing research and development of successful approaches. The field-based demonstration activities will focus primarily on: i) supporting the design and implementation of community-based natural resource management/forestry; and ii) promoting and disseminating SBES as alternatives to traditional households methods for cooking and heating.

Following the elaboration of the PIF during the PPG phase, including the development of site selection criteria in participation with senior government representatives (See Appendix 12), two pilot regions were proposed for the field-based activities of the project, namely: i) Dara-e-Noor district in Nangerhar province, in the Eastern Forest Complex region; and ii) Salang district in Parwan province, in the Central Highlands region. The location of the proposed pilot districts, relative to the capital of Kabul, is depicted in Figure 1 below.



Figure 1. Location of proposed pilot sites in Parwan and Nangerhar provinces.

The proposed GEF project will address the threats to the globally beneficial sectors described below.

b) Global Environmental Benefits (GEB) status, threats and causes

b.1) Greenhouse gas (GHG) emissions

As a result of Afghanistan's limited industrial development, the country's national GHG emissions are small relative to larger economies. Nevertheless, in 2005 total emissions were estimated at 28759 Gg CO₂ with no net removals¹. The largest sources of GHG emissions were the sectors of agriculture (~53%) and land-use change/forestry (~33%), respectively. The energy sector accounted for ~13% of emissions, while industrial processes and waste contributed ~1% and 0.5% respectively. Consequently, the combined sector of LULUCF is by far the greatest contributor to GHG emissions. An estimated 452.25 Gg CO₂e was released in 2005 from forest and other woody biomass stocks, largely attributable to conversion of forest and grassland².

As a result of significant gaps in data to estimate historic GHG emissions, trends in GHG emission growth rates are difficult to extrapolate. At present, per capita electricity consumption is extremely low (140 kWh per capita), gross electricity supply is expected to grow from 3,531 GWh in 2011 to 23,631 GWh in 2032³. Should national government be unable to meet this increase in demand for energy, natural resources will be exposed to further exploitation as both an energy source and livelihood opportunity while lack of electrification is constrained to the development of industrial or services sectors. Further details on emissions types and sources are discussed below and in Appendix 9.

¹ UNFCCC, Greenhouse Gas Inventory Data, 2014, <http://unfccc.int/di/DetailedByParty/Event.do?event=go> [Accessed 2104-12-10]

² Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

³ GoIRA (2013). Power Sector Master Plan. MEW.

b.2) Land use, land use change and forestry in Afghanistan

- *Classification of land use and land use change in Afghanistan*

Several assessments of Afghanistan's vegetation and ecoregions have been undertaken over the past decades, each of which uses slightly different classification systems (described further in Appendix 8). Efforts to classify and estimate the spatial extent of Afghanistan's ecoregions and vegetation types have been challenged as a result of the absence of consistent monitoring during the prolonged periods of conflict and instability. At present, the most up-to-date classification of land cover is the 2010 Afghanistan Land Cover Database generated by FAO using 10m Color SPOT satellite image interpretation, and state-of-the-art FAO-developed tools and methodology¹. The "enrichment" of the 2010 land cover database using air photos is anticipated to be finalised in 2015. The finalised land cover database will provide the most accurate and comprehensive assessment of distribution and extent of vegetation in Afghanistan and will provide a basis for estimation of deforestation rates and land use change in the future. It should be noted that no comprehensive field verification of the assumed land cover classes could be undertaken as a result of security challenges, and therefore there is a need for the assumptions of the land cover classification to be tested and revised based on groundtruthing in the future.

25 LCCS land cover classes were designated for Afghanistan's 2010 land cover map², which were derived from the initial classifications used in the 1993 database. The major categories of natural vegetation which contain woody biomass are:

Tree-covered regions and shrub lands (NFS) - consisting of Needle-leaved Evergreen Forests (Dense and Open), Undifferentiated Tree-covered Regions and Shrublands (respectively LCCS classes 6A, 6B, 6B1 and 6C); and

Rangelands (NHS), LCCS class 7. Further detail on LCCS database is presented in Appendix 8.

The Eastern provinces – including Nuristan, Laghman, Nangahar and Kunar – surrounding the Eastern Forest Complex (EFC) are primarily characterised by species such as *Quercus*, *Pinus*, *Cedrus*, *Juniperus* and other evergreen forest tree species, equivalent to the LCCS class of 'Needle-leaved Forest'³. The vegetation type in this area most closely corresponds to the WWF Ecoregion 'East Afghan Montane Conifer Forest'⁴. In the classification system used by Breckle, forest vegetation in this area includes the transition between the forest categories of 'Himalayan type Evergreen Forests in East Afghanistan' below 2,200m and 'Temperate Coniferous Forests of East Afghanistan'⁵. The distribution of tree species within this ecoregion is primarily a function of altitude and corresponding rainfall and temperature. At altitudes of ~1,200-2,100 m, vegetation is characterised by *Quercus baloot* as well as several other commercially valued tree species such as almond (*Amygdalus kuramica*) and pistachio (*Pistacia khinjuk*). Reportedly, these forests have been severely overexploited for fodder, fruits and woodfuel and as a result the majority of the vegetation has been degraded or converted to other land uses. At an altitude of 2,100-2,500 m, forests are largely characterised by a transition between *Q. baloot* and dry coniferous species such as *Pinus gerardiana*. Deforestation or overgrazing of this vegetation results in a conversion to *Cotoneaster-Sophora-Rosa* scrubland. At higher altitudes of 2,500-3,100 m, species composition is characterised by a mix of temperate deciduous species and conifers, including *Picea smithiana*, *Pinus wallichiana*, *Quercus semecarpifolia*, and *Cedrus deodara*. This vegetation type is severely threatened by illegal logging, particularly for the highly valued *Cedrus* timber, and is converted to stable communities of *Artemisia*

¹ FAO's Land Cover Classification System, LCCS, Image segmentation (Definiens e-Cognition SW) and FAO Land Cover Mapping software (Terra Nova's GeoVis/MadCat software suite)

² FAO (2014). Afghanistan Land Cover Statistics Review In the Framework of FAO Project TCP/AFG/3501. Harmonization and Finalization of Land Cover Mapping and Approaches to Agricultural Monitoring

³ Natural Resource Management and Peace Building in Afghanistan, United Nations Country Team in Afghanistan, United Nations Environment Programme, May 2013

⁴ World Wildlife Fund Ecoregions. Temperate Coniferous Forest.

<http://www.worldwildlife.org/ecoregions/pa0506>

⁵ Breckle, S-W. Flora and Vegetation of Afghanistan. http://www.ag-afghanistan.de/files/breckle_flora.pdf

scrubland. Above 3,100 m, cedar forests gradually transition into junipers such as *Juniperus seravschanica*¹.

The vegetation that characterises the EFC, including Nangarhar as well as surrounding provinces, comprise a wide variety of commercially valuable and useful species that have the potential to generate multiple benefits for local communities. Commercially valuable products generated by these forests include woodfuel, timber, fruits and nuts, and fodder for livestock. However, as a result of the prolonged exploitation of these forests, the spatial extent and biomass density of these forests continues to decline while the productivity of existing forests continues to decrease as a result of degradation and overexploitation.

In the central and northern regions, centred on Herat and Baghdis Province, open woodland defined by juniper (*Juniperus squamata*) and pistachios (*Pistacia vera*) is the naturally occurring forest type, which is comparable to the LCCS class of ‘Undifferentiated Woodland’. Although these woodland areas are not exposed to illegal logging for timber to the same extent as the forests in the East, however the ‘scorched earth’ practices during the period of Soviet occupation and the large local demand for woodfuel have resulted in considerable reduction in the extent of these open woodlands.

The largest vegetation class in all of Afghanistan are the rangelands, with an expanse of over 30,000,00 ha². There are further marginal areas classed as ‘barren land’ rangeland, but are still used for grazing. In total grazing is practiced over 70-85% of land area and supports ~35 million heads of livestock. Rangeland ecosystems are highly variable in vegetation composition between provinces and regions, however these areas are critical throughout the countryside as a source of woodfuel for households and fodder for livestock³. Furthermore, rangelands have the potential to create export earnings through products such as wool, medicinal plants and processed products such as carpets and rugs. Rangelands vary based on precipitation and altitude. The types and predominant species are summarised below in Table 1. Given Afghanistan’s strong seasonal variation and interannual rainfall variability, there is significant variation of species between seasons and years in the more arid areas.

Table 1: Summary of Rangeland types, location by province and predominant genera and/or species.

Type	Location by Province	Predominant Genera/Species
Desert-like Rangelands	Herat, Farah, Nimroz	<i>Haloxylon persicum</i> , <i>Salsola richteri</i> , <i>Calligonum</i> , <i>Artemisia</i>
Semi-desert Rangelands	Balkh, Badghis, Sheberghan	<i>Trigonella</i> , <i>Iris</i> , <i>Tulipa</i> , <i>Allium</i> , <i>Diarthon</i> , <i>Poa</i> , <i>Carex</i> , <i>Cousina</i> , <i>Psoralea</i> , <i>Ammothamnus</i>
High Elevation Semi-desert Rangelands	Khost, Nangarhar, Kunar, Nuristan, Badakhshan	<i>Acantholium</i> , <i>Acanthophyllum</i> , <i>Cousina</i> , <i>Artemisia</i> , <i>Poa</i> , <i>Koeleria</i> , <i>Festuca</i> , <i>Triognella</i> , <i>Oxytropis</i> , <i>Leucopa</i>

Overgrazing has had detrimental impacts in all these rangelands types. In desert-like systems, the absence of these species and their binding root systems has led to desertification and dune encroachment on farmlands. In both semi-desert and high elevations areas, there has been an increase in the proportion of cover of less palatable species, reducing the productivity of these rangelands. Local communities are increasingly resorting to harvesting the woody species (such as *Leucopa* spp.) preferentially for woodfuel, which results in conversion of habitat and shift in dominant species.

¹ World Wildlife Fund Ecoregions. Temperate Coniferous Forest.

<http://www.worldwildlife.org/ecoregions/pa0506>

² Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

³ Wijangco, J.E.R., Best Practices and Lessons Learned in Community Based Natural Resource Management in Afghanistan, MDG Achievement Fund

The reported figures in the 2010 Land Cover Database for the abovementioned LCCS categories are detailed in Table 2 below.

Table 2. Summarised changes in Afghanistan's woody vegetation, including forests, woodlands and rangelands.

LCCS class	Sub-class	1993	2010	% change	Total change (ha)
<i>Needle-leaved forest</i>	Total	1 190 078	983 039	-17,4	-207 039
	<i>Trees, dense</i>	941 580	79 614	-91,5	-861 966
	<i>Trees, open</i>	248 498	903 425	263,6	654 927
<i>Undifferentiated trees</i>	/	/	233 252	/	233 252
<i>Shrubland</i>	/	116 498	477 465	309,8	360 967
<i>Rangeland</i>		29 176 733	30 275 014	3,8	1 098 281

Summary of national land cover statistics indicates that the total national extent of natural needle-leaved evergreen forests in 2010 was ~983,038 ha, of which 79,614 ha was classified as 'closed needle-leaved trees' and a further 903,425 ha was classified as 'open needle-leaved trees'. Overall, the total spatial extent of needle-leaved evergreen forest was reduced by ~207,000 hectares or 17%. This equates to an annual deforestation rate of ~1.2% in evergreen forests¹, equivalent to ~12,180 ha or ~1.2% per annum. It is probable that the actual rate of deforestation is considerably higher, considering the reported loss in historical extent of forest. For example, UNEP's 2003 report "Post-conflict environmental assessment" report² notes that deforestation in the Eastern Region is particularly acute and estimates that ~50-80% of forests have disappeared in the period 1977 to 2002. Similarly, USAID estimates that pistachio woodlands have been exposed to considerable deforestation and degradation during the past 30 years, from 40 to 100 trees per hectare to the current estimate of 20 to 40 trees per hectare.

- *Deforestation and degradation of forests and rangelands*

The severe degradation and deforestation that affects these forests are the result of several causes. The EFC districts closest to the border with Pakistan are characterised by insecurity and as a result the availability of government extension services is variable. Many villages in this region have been severely affected by prolonged conflict, which has hindered the rate of development. Traditional social and governance structures have become fragmented as local communities have been displaced and community leaders have been killed in conflict. This has caused a breakdown in the traditional management structures and practices agreed between communities for management of forests and natural resources, as the memory of these agreements is lost. Consequently, the forest resources in the east have been exposed to prolonged exploitation of highly valued timber and forest products without any explicit management plan, whether traditional or formal. One of the most significant causes of deforestation is the illegal timber trade. The wood of the cedar (*Cedrus deodara*) is particularly highly prized as timber, and there is a network of timber smuggling interests that supplies this trade across the remote and wide areas that border Pakistan. The trade in illegal timber is considered to be a contributing factor to the ongoing conflict in the area as the proceeds of smuggling are thought to be used to fund insurgent groups. One of the more damaging impacts of the illegal logging is that the practice of using chainsaws prevents regrowth from coppicing, because the heat of the chain burns the latent coppice shoots³. As a result of the localised instability and conflict, accurate studies of this deforestation have not been possible.

Another significant causes of deforestation and degradation is the widespread reliance on woody biomass as a domestic fuel to be burned for cooking and warmth. As a result of the widespread

1 FAO (2014). Afghanistan Land Cover Statistics Review In the Framework of FAO Project TCP/AFG/3501. Harmonization and Finalization of Land Cover Mapping and Approaches to Agricultural Monitoring

² UNEP (2003). Post-conflict environmental assessment, United Nations Environment Programme, Afghanistan

³ Eng. Khaurin, former DG of DoF, pers. comm. 23 September 2014

destruction of infrastructure such as road, dams, and electricity infrastructure, many communities will remain ‘offgrid’ and reliant on woodfuel as the only available source of energy (detailed further below, also in Section 2 and Appendices 7, 9 and 10).

Inappropriate land use management practices, including unsustainable rates of livestock grazing and inadequate rotation, also results in land degradation. One of the most dramatic effects of land degradation is increased soil erosion. Tectonic activity, friable soils and irregular rainfall contribute to erosion and the loss of productive soils¹. More than 80% of the land is considered susceptible to erosion. Artisanal mining and informal brickmaking operations also contribute to isolated pockets of degradation². Agricultural expansion to meet the needs of a growing population, including the return of refugees, has led to the encroachment of cultivated fields into traditional grazing land and high mountain areas and results in further land use change and conversion of natural vegetation.

- *National GHG emissions resulting from woody biomass removal from forests and rangelands*
The land cover change data described in the section above was used to guide an assessment of GHG emissions resulting from woody biomass removals from all woody vegetation categories in the period 1993 – 2010. These figures are based on the adoption of assumed aboveground woody biomass estimates based on IPCC Good Practice Guidelines. The justification for these assumptions and the approach to assessing GHG emissions from land use change is detailed further in **Appendix 8**. A summary of GHG emissions from woody biomass removal is presented in Table 3 below.

Table 3. Summarised GHG emissions from woody biomass.

LCCS class	Aboveground woody biomass (tonnes/ha) ^{3, 4}	Woody biomass (tonnes)			
		1993	2010	Total change	Annual change
Trees, dense	50	47,079,000	3,980,700	-43,098,300	-2,535,194
Trees, open	14	3,478,972	12,647,950	9,168,978	539,352
Trees closed-open, undifferentiated	14		3,265,528	3,265,528	192,090
Shrubland, degenerated forest	7.8	908,684	3,724,227	2,815,543	165,620
Rangeland	4.5	131,295,299	136,237,563	4,942,265	290,721
Total	/	182,761,955	159,855,968	-22,905,987	-1,347,411

It is estimated that in the period 1993-2010 a total of ~22.9 million tonnes of woody biomass were lost as a result of vegetation conversion, which can be largely attributable to deforestation and degradation. This is equivalent to an annual loss ~1.4 million tonnes of woody biomass per year. Assuming that woody biomass is ~50% C by mass, and that woody biomass is converted to CO₂ as the main GHG, these figures indicate that **annual emission of GHGs from removal of woody biomass is equivalent to ~2.48 million tonnes of CO₂equivalent per year.**

¹ Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

² Natural Resource Management and Peace Building in Afghanistan, United Nations Country Team in Afghanistan, United Nations Environment Programme, May 2013

³ IPCC Good Practice Guidelines for LULUCF. Chapter 3: LUCF Sector Good Practice Guidance, Appendix 3A.1 Biomass Default Tables for Section 3.2 Forest Land

⁴ Ruesch, Aaron, and Holly K. Gibbs. 2008. New IPCC Tier-1 Global Biomass Carbon Map For the Year 2000. Available online from the Carbon Dioxide Information Analysis Center [<http://cdiac.ornl.gov/>], Oak Ridge National Laboratory, Oak Ridge, Tennessee

- *GHG emissions resulting from woody biomass removal from forests and rangelands in pilot project areas*

A brief summary of the rate of land use change and resultant GHG emissions for the two pilot areas are provided below. These figures are based on comparisons of land cover data in the years 1993 and 2010 and have assumed figures for woody biomass content based on IPCC Good Practices Guidelines. Please consult **Appendix 8** for further analysis.

The change in total woody biomass carbon in the major wooded vegetation categories between 1993 and 2010 in Nangerhar are summarised in Table 4 below.

Table 4. Summarised changes in total woody biomass carbon in Nangerhar between 1993 and 2010.

LCCS class	Aboveground woody biomass (tonnes/ha)	Biomass (tonnes)			
		1993	2010	Total change	Annual change
Trees, dense	50	4,155,950	118,732	-4,037,219	-237,483
Trees, open	14	169,568	798,092	628,524	36,972
Shrubland	7.8	74,825	31,837	-42,988	-2,529
Total		4,400,343	948,661	-3,451,682	-203,040

The above results indicate that the total removal of woody biomass vegetation in the period 1993 – 2010 resulted in the loss of ~3,4562 kilotonnes of wood, equivalent to 203 kilotonnes of woody biomass per annum. **In terms of equivalent GHG emissions, this trend in land use caused emission of ~373,000 tonnes CO₂equivalent per annum from Nangerhar province¹.**

The change in total woody biomass carbon in the major wooded vegetation categories between 1993 and 2010 in Parwan are summarised in Table 5 below.

Table 5. Summarised changes in total woody biomass carbon in Parwan between 1993 and 2010.

LCCS class	Aboveground woody biomass (tonnes/ha)	Biomass (tonnes)			
		1993	2010	Total change	Annual change
Trees, open	14	8,470	1,066	-7,404	-436
Shrubland	7.8	0	6,520	6,520	384
Rangeland	4.5	2,980,643	1,839,335	-1,141,307	-67,136
Total		2,989,113	1,846,922	-1,142,191	-67,188

The above results indicate that the total removal of woody biomass vegetation in the period 1993 – 2010 resulted in the loss of ~1,142 kilotonnes of wood, equivalent to 67 kilotonnes of woody biomass per annum. **In terms of equivalent GHG emissions, this trend in land use caused emission of ~123,000 tonnes CO₂equivalent per annum in Parwan province².**

b.3) Domestic energy and reliance on biomass fuels

(detailed further in Appendix 7 & 9)

One of the most significant impacts of the prolonged period of conflict is the damage and destruction of key infrastructure. In consequence, many rural communities are likely to remain relatively inaccessible and without access to public services and electrification in the near future. Biomass is still the dominant fuel source in both urban and rural Afghanistan, where it is estimated that 36% of the urban population and ~97% of the rural population are totally reliant on solid biomass fuels³. It was estimated that in 2011, only ~28% of the population was able to access the national grid, and then only

¹ Assuming biomass carbon content of ~50% and total conversion to CO₂ as opposed to other GHGs.

² Ibid.

³ Global Alliance for Clean Cookstoves (2014).

intermittently¹. Rural areas do make use of local waste, solar PV panels, batteries, coal and kerosene but only on a limited scale. Parabolic solar cookers, widely used in energy scarce areas across the region, were banned under the Taliban regime because of their resemblance to satellite dishes and have had limited uptake since. Numerous development agencies are implementing initiatives that distribute renewable or alternative energy sources. However, in isolated and remote areas, the majority of the population relies on woodfuel as their primary energy source for heating, lighting and cooking. Traditional cooking methods are not particularly fuel-efficient and are generally undertaken using multi-purpose systems that provide heat for cooking, household heat and boiling water. Therefore, traditional stoves and use of biomass energy results in significant energy loss and emission of GHGs.

A detailed assessment of traditional methods of heating and cooking was undertaken in Badakhshan province². This high altitude area (2,000-4,000masl) is characterised by severe and extended winters, and as a result the need for household heating is the most significant driver of household energy needs. The systems employed in this area are designed to allow for multiple cooking purposes as well as household heating. *Tanur* or *tandoor* clay oven, set at a depth of ~0.5m within the floor, are fuelled by a mix of firewood, brush and cow dung. The initial heat of the fire is used to bake *naan* flatbreads inside the oven as well as cooking of traditional dishes over a pot or wok. Once flames have died down, the remaining ashes and residual heat may be used to heat water. However, in addition to the utility for cooking and water-heating, the area surrounding the oven is traditionally the family-gathering place, where members of the household will sit to enjoy the remaining warmth. The average annual consumption of woodfuel by households using the floorpit or *tandoor* systems for warmth, cooking and heating of water is estimated to be 10-14 tonnes of woodfuel per household³.

The near-universal reliance on biomass-based fuels in Afghanistan has resulted in major negative impacts on human health, household finances and environmental integrity. Among the most immediate and apparent impacts on households is the high financial costs of purchasing firewood, dung and other household fuels. While the price of woodfuel varies widely according to availability and seasonal demand, in some particularly poor areas households have reported spending up to ~80% of annual income on household fuel⁴. In 2007 it was estimated that the average rural household spent ~USD240-340 to meet their annual energy needs⁵. In cases where households undertake the collection of woodfuel from nearby farms, forest and rangeland, the increasing scarcity of woody biomass results in increased time and labour spent on woodfuel collection. In consequence, women and children are diverted from other productive tasks such as farm labour, schoolwork or recreation.

The other significant impact of traditional biomass fuel use is the negative effect on human health, particularly for women (who are mainly responsible for cooking and tending to the fire) and children in the homestead. Of particular concern is the risk of damage to lungs and eyes arising from inhalation of soot and other particulate matter, as well as the potential risk of poisoning from carbon monoxide inhalation⁶. As women are traditionally assigned to do the cooking, they are the worst affected by this pollution. A further impact is that any household member that needs to seek medical attention may

¹ Afghanistan Initial National Communication to the UNFCCC, National Environmental Protection Agency of the Islamic Republic of Afghanistan, 2013

² Nienhuys (2009). Cooking Stoves in Afghanistan Badakhshan.

http://www.hedon.info/docs/Nienhuys_AfghanistanEnergy_March09.pdf

³ *ibid*

⁴ Nienhuys (2012). Improved Cooking Stove (ICS). Saving 50% Cooking Energy with a Metal ICS. Examples from Tajikistan, Pakistan and Afghanistan. Technical Working Paper 10.

http://www.nienhuys.info/mediapool/49/493498/data/HA_TechWorkPaper-10_ICS_April_2012_.pdf

⁵ Household Energy Network (2007). Household energy in Afghanistan. HEDON Network.

<http://www.hedon.info/HouseholdEnergyInAfghanistan&highlight=afghanistan>

⁶ Nienhuys (2012). Improved Cooking Stove (ICS). Saving 50% Cooking Energy with a Metal ICS. Examples from Tajikistan, Pakistan and Afghanistan. Technical Working Paper 10.

http://www.nienhuys.info/mediapool/49/493498/data/HA_TechWorkPaper-10_ICS_April_2012_.pdf

contribute further to the financial burdens on the household¹. These ailments, untreated or otherwise, also cause households to be less productive than they would otherwise be when healthy.

- *Emission of GHGs resulting from household use of biomass fuels in the proposed pilot sites*

The proposed pilot provinces of Nangerhar and Parwan are described in extensive detail in Appendices 8 & 9, which includes demographic profiles. Furthermore, these appendices include detailed assessments of GHG emissions resulting from: i) land use, land use change and forestry; and ii) household consumption of biomass fuels; in Appendix 8 & 9, respectively. A brief summary of the rate of biomass fuel consumption and resultant GHG emissions by households in the two pilot areas are provided below in Table 6 – 9. These figures are derived from reported household consumption of woody biomass during interviews with community members undertaken in the provincial consultation phase of the PPG. Please consult **Appendix 9** for further analysis.

Dara-e-Noor, Nangerhar province

Table 6. Seasonal household biomass consumption.

Fuel type	Household fuel consumption rates	Unit	Annual household consumption (kg/year)
Dung	Winter consumption (kg/day)	3.5	1,276
	Winter duration (days)	152	
	Summer consumption (kg/day)	3.5	
	Summer duration (days)	213	
Firewood	Winter consumption (kg/day)	14.0	3,632
	Winter duration (days)	152	
	Summer consumption (kg/day)	7.0	
	Summer duration (days)	213	

By the estimates above, a household consumes over 1 tonne of cow dung and over 3.5 tonnes of firewood in a year. By applying the assumptions detailed previously, estimates of GHG emissions attributable to household consumption of biomass fuels can be derived (Table 7).

Table 7. Estimated GHG emissions attributed to household consumption of biomass fuels.

Fuel type	Annual household consumption (kg/year)	Annual per capita consumption (kg/person/year)	Annual household CO ₂ emission (kg/year)	Annual per capita CO ₂ emission (kg/person/year)
Dung	1,278	197	2,344	362
Firewood	3,620	559	6,642	1027
Total			8,986	1,389

The average per capita consumption of biomass fuel in Dara-e-Noor equates to an estimated ~1.4 tonnes CO₂equivalent per annum.

Salang, Parwan province

Table 8. Seasonal household biomass consumption.

Household fuel consumption rates		Unit	Annual household consumption (kg/year)
Dung	Winter consumption (kg/day)	3.5	1,278
	Winter duration (days)	152	

¹ Household Energy Network (2007). Household energy in Afghanistan. HEDON Network. <http://www.hedon.info/HouseholdEnergyInAfghanistan&highlight=afghanistan>

	Summer consumption (kg/day)	3.5	
	Summer duration (days)	213	
Firewood	Winter consumption (kg/day)	14	3,620
	Winter duration (days)	152	
	Summer consumption (kg/day)	7	
	Summer duration (days)	213	
Brush	Winter consumption (kg/day)	3,5	1,277
	Winter duration (days)	152	
	Summer consumption (kg/day)	3,5	
	Summer duration (days)	213	
Charcoal	Winter consumption (kg/day)	2,0	2,433
	Winter duration (days)	152	
	Summer consumption (kg/day)	2,0	
	Summer duration (days)	213	

Table 9. Estimated GHG emissions attributed to household consumption of biomass fuels.

Fuel type	Annual household consumption (kg/year)	Annual per capita consumption (kg/person/year)	Annual household CO ₂ emission (kg/year)	Annual per capita CO ₂ emission (kg/person/year)
Dung	1,276	215	2,344	394
Firewood	3,620	452	6,642	830
Brush	1,278	215	2,344	394
Charcoal	2,433	304	4,465	558
Total			15,796	2,176

The average per capita consumption of biomass fuel in Salang equates to an estimated ~2.2 tonnes CO₂equivalent per annum.

As described above, there is considerable emission of GHGs from Afghanistan's land use and domestic energy sectors, which can be attributed in large part to: i) unsustainable rates of biomass fuel use; and ii) rapid rates of deforestation and degradation from multiple land use activities in forest, woodland and rangeland areas.

c) Institutional and policy framework

GoIRA's institutional and policy framework has undergone, and is still in the process of, a period of legislative reform and strengthening. At present the country is undergoing the first democratic transition of power and the policies of the next phase of governance are still in development. Up until the present time, however, Afghanistan's **National Development Strategy (ANDS, 2008 – 2013)** served as the central strategic document to guide the priorities of GoIRA's line ministries. The goals of the ANDS are:

- Security: Achieve nationwide stabilization, strengthen law enforcement, and improve personal security for every Afghan.
- Governance, Rule of Law and Human Rights: Strengthen democratic processes and institutions, human rights, the rule of law, delivery of public services and government accountability.
- Economic and Social Development: Reduce poverty, ensure sustainable development through a private-sector-led market economy, improve human development indicators, and make significant progress towards the Millennium Development Goals (MDGs).

The ANDS addresses the above goals by arranging the most urgent development priorities within three clusters, under which sector-specific National Priority Programmes (NPP) were initiated. The NPPs are one of the primary mechanisms through which the ANDS is implemented, through the following three 'clusters': i) Governance; ii) Security; and iii) Socio-Economic Development, sub-divided into

economic and infrastructure development, human resource development, and agricultural and rural development.

c.1) Rural development

One of the main underlying themes of the ANDS is the urgent need to increase service delivery and improve the standard of living in the impoverished rural areas. All ministries have a potential contribution to the process of rural development, however the line ministry which was established with this primary objective is the **Ministry of Reconstruction and Rural Development (MRRD)**. Specifically, MRRD is mandated with improving infrastructure, building local planning and management capacity, and promoting rural livelihoods. An important programme in the portfolio of MRRD is the **National Area-based Development Programme (NABDP)**, which focuses on the establishment and training of District Development Assemblies (DDAs). The objective is to increase the capacity of DDAs as a mechanism for improving service delivery, livelihood diversification, governance and infrastructure. The principle focus of the NABDP is on: i) local institution building in the form of DDAs to promote private-public partnerships; ii) developing rural infrastructure in the form of roads, bridges and other essential components; iii) natural resource management through community interaction; iv) rural energy development, particularly renewable energy in rural areas; and v) rural economic development to provide a conducive environment for rural enterprise initiatives.

The NABDP was divided into three phases. Phase I represented the original aims of the NABDP, focusing on the MRRD's institutional capacity, quick-impact projects, and local economic regeneration programming and research. The NABDP's role was broadened under Phase II, which instituted a strategic framework for the developing programmes. Phase III (2009 – 2014) is facilitated by the UNDP and funded by nine European countries to the amount of US\$294.7 million. This Phase focuses on the long-term goals of the DDA system, providing the support needed to create sustainable capable local governance institutions. To date, the NABDP has established 388 DDAs in 34 provinces (with members elected from among the Community Development Councils (CDCs) and 293 DDAs in 33 provinces received Grant-in-Aid – including organisational and physical capacity support. Furthermore, 123 DDAs have successfully held re-elections. With respect to the proposed pilot provinces for this GEF project, the NABDP has completed 236 projects in Nangarhar, costing US\$13,844,471, creating 437,510 labour days, and benefiting 1,552,415 people. There are a further 20 ongoing projects in the province, with a combined budget of US\$1,854,878, expected to generate a further 67,852 labour days and benefit 176,599 people. The NABDP has completed 49 projects in Parwan, costing US\$3,862,300, creating 125,337 labour days, and benefiting 401,022 people. There are a further 14 ongoing projects in the province, with a combined budget of US\$1,157,103, expected to generate a further 34,818 labour days and benefiting 89,361 people.

The design and objectives of the NABDP were informed by another long-term programme implemented by MRRD, namely the **National Solidarity Programme (NSP)**. The NSP was established to develop the ability of Afghan communities to identify, plan, manage and monitor their own development projects through the following approaches: i) establishing CDCs in a democratic manner; ii) building the capacities of CDC and community members in a variety of areas, primarily local-governance and development; iii) providing direct block grant transfers to fund approved sub-projects identified, prioritised and managed by the communities; and iv) linking CDCs to government agencies, NGOs, and donors to improve access to services and resources.¹

The NSP provides a block grant to each community with an established CDC and a detailed Community Development Plan (CDP). The CDC may decide to utilise its block grant for community-prioritised infrastructure sub-projects from a relatively open NSP-permissible sub-project menu. The entire community's block grant entitlement needs to be committed into one or two approved sub-project proposals, and disbursements are then made in tranches of 90% and 10% into a bank account

¹ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

owned and operated by the CDC on behalf of the community¹. By September 2015, the NSP aims to have established ~39,056 CDCs and provided them with the first round of block grants. Furthermore, 12,000 selected CDCs will receive a second round of block grants².

The NSP project cycle for each participating community is made up of the following five phases, usually completed within two-years³:

- Phase I: the NSP Facilitating Partner (FP) assigned to the province (typically an NGO) contacts the community and begins the mobilization process.
- Phase II: the FP facilitates elections to establish a CDC.
- Phase III: the newly-elected CDC consults with the members of the community to reach consensus on a list of priority sub-projects. These include sub-projects that can be carried out independently and those that require support from the NSP or others. Together, these comprise a Community Development Plan (CDP). Selected sub-project proposals are submitted to the NSP for funding.
- Phase IV: upon approval, the NSP block grant funds are disbursed to cover the purchase of materials and services. The CDC undertakes implementation of sub-projects (often through committees) and reports to the community on progress and use of funds. Programme partners then monitor the ongoing sub-projects.
- Phase V: programme partners assess the technical quality of completed sub-projects and document lessons learned.

The NSP has contracted a total of 31 FPs to support the communities in NSP field implementation. Their role includes the establishment and capacity building of the CDCs, and the oversight, monitoring and technical assistance in the planning and implementation of the communities' sub-projects financed by the NSP block grants.⁴

The total NSP budget for the period from May 2003 to September 2015 (not including community contributions) amounts to US\$2.5 billion. The total expenditure – as of 21st Aug 2014 – is US\$2.04 billion, divided into the following core components⁵:

- Component 1 – Establishment and capacity building of CDCs (i.e. all FP costs): US\$339.17 million (16.63%);
- Component 2 – Community grants for economic and social development (all block grant costs): US\$1.514 billion (74.23 %);
- Component 3 – Project implementation support (all non-block grant and non-FP costs): US\$186 million (9.14 %).

c.2) Natural resources, forests and rangelands

Natural resources are governed by numerous laws and policies, the most important of which is the **Environment Law** (2007). The Ministry of Agriculture, Irrigation and Livestock (**MAIL**) is primarily mandated with the management and development of Afghanistan's agricultural sector as well as natural resources such as forests and rangelands through its Natural Resources Directorate (NRD) and relevant departments, the Department of Forestry (DoF) and Range Land Department (RLD). MAIL also chairs the Agriculture and Rural Development cluster of the NPPs. Subsequent to the adoption of the Environment Law, Afghanistan's forestry legislation was updated in the revised **Forest Law**

¹ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

² NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

³ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

⁴ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

⁵ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

(2011), which provides for the management, conservation and sustainable use of forests and forest resources in Afghanistan. The extensive rangeland areas of the country are governed by the **Rangeland Law** (2014 draft).

Through these laws, the DoF is responsible for the implementation of legislation, enforcement of protection, and ensuring inter-sectoral coordination for protection and management of natural resources. However, an important feature of the Forest and Rangeland Laws is the inclusion of measures that allow for decentralisation of natural resource management to community-based structures. Forest resource rights may be conferred by MAIL to grant communities the autonomy to manage forests on community or state land¹, provided this is done in accordance with the principles set out in the Forest Law and Environmental Law. In order to apply for these rights, communities need to form a Forest Management Committee (FMC). This can be either a new organisation or an existing one (such as CDCs or agricultural cooperatives). A chairperson and committee must be elected and a written constitution agreed upon. Following this, the FMC must be registered with the provincial council and Department of Forestry. According to the Forest Law, the purpose of FMCs is to “productively manage forest resources according to traditional means, with little interference from the government”². Resource rights can only be granted in relation to forests on land where ownership is not in dispute. The process of decentralisation of forest resources to FMCs is depicted in Figure 1, below.

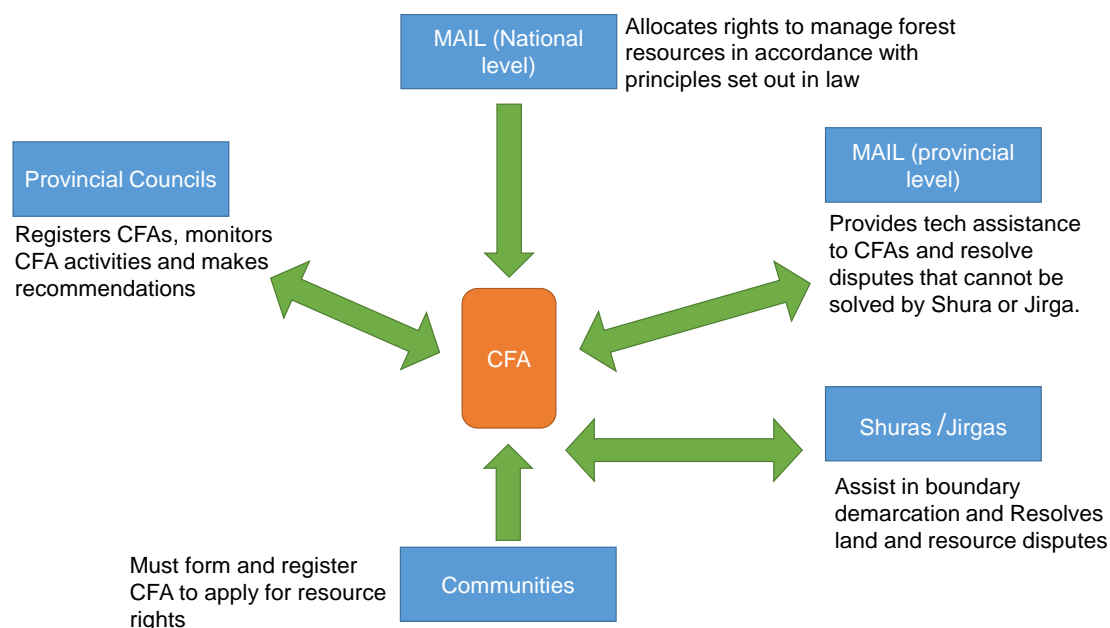


Figure 2. Process of decentralisation of forest resources to Communitiy Forestry Associations/Forest Management Committees.

The **National Forest Management Plan (NFMP)** (2012) was developed in order to implement priority actions under the ‘Biodiversity and Land Management’ sub-component of the ‘Environmental Conservation and Management’ component of NPP-1. One of the objectives of the NFMP is to establish a framework for managing Afghanistan’s forests through promoting the establishment of CBNRM and CBFM. Afghanistan’s **National Plan for Sustainable Rangeland Management (NPSRM)**, which was developed in 2011 by MAIL. The NPSRM is a five-year plan that will provide a framework and roadmap to better facilitate a comprehensive integrated approach to rangeland management. The national plan will lay the foundation for the development and execution of a

¹ This does not include forests on private land.

² Bowling, B. 2008. USAID Forestry Partners Workshop, Kabul.

National Programme on Sustainable Rangeland Management through evidenced-based policymaking and cross-institutional partnerships. One of the main focuses of the NPSRM is to strengthen CBNRM in Afghanistan by linking community user rights to management responsibilities and providing incentives for communities to manage rangelands responsibly, through management plans¹. In addition, two recent policy documents - the Master Plan for Natural Resources and Environment Protection and the Forest, Range and Wildlife Policy - are providing guidance for forestry sector management and development. These policies are emphasizing the roles and responsibilities of all actors and particularly the communities in managing natural resources.

Consequently, the promotion of CBNRM is viewed as an important priority within the programmes under the ANDS. However, there are multiple barriers which prevent the widespread implementation of this objective (detailed in Section 1.2 further below).

c.3) Energy and renewable energy

(Note: An expanded overview of Afghanistan's energy sector, including the institutional framework and stakeholders, will be detailed in Appendix 11, which should be consulted for further detail).

The institutional environment governing the country's energy resources has undergone considerable development and investment in the past decade and resulted in the drafting of updated policies for energy. Afghanistan's Energy Policy (2009) describes energy development laws and regulations. The policy focuses on developing national power-generating capacity, including the role of renewable energy. A draft of the Afghanistan Renewable Energy Policy (ANREP) was prepared under the GIZ-led "Renewable Energy Supply for Rural Areas" (ESRA) programme and presented to the Inter-Ministerial Commission on Energy in September 2014 and is currently awaiting adoption. The policy describes Afghanistan's proposed approach to incorporating renewable energy into national strategies and identifies SBES as a high priority area for development by future initiatives. Furthermore, the draft ANREP notes the need to develop a Renewable Energy Strategy and Action Plan to support the implementation of the ANREP and its integration into sectoral priorities.

There are multiple government institutions mandated with developing various elements of Afghanistan's energy resources, most importantly the Ministries of Energy and Water (MEW) and Rural Rehabilitation and Development (MRRD). These ministries have separate but overlapping mandates, which may be executed separately or sometimes in coordination with each other and the Ministries of Finance (MOF) and Ministry of Economy (MOEc). The state-owned electricity utility company – called Da Afghanistan Breshna Sherkat (DABS), is mandated with the management of infrastructure once it has been developed by MEW. Implementation of projects greater than 200 kW is the mandate of MEW and other private utilities such as DABS while projects smaller than 200 kW are the mandate of MRRD. Renewable energy projects less than 15 kW are delicensed. The role of these agencies is described in further detail below.

- *Ministry of Energy and Water (MEW)*

The main roles of MEW in developing the renewable energy sector in Afghanistan are to prepare policies, strategies, action plans and laws, create a platform for decision-making, implement renewable energy projects and help other developing agencies with security, land acquisition and licensing issues. According to ANREP, MEW is the institution responsible for the development of the large-scale (>200 kw) renewable energy sector at the national, provincial and district levels. The Renewable Energy Department (RED) was established in 2009 as the technical body concerned with the development of renewable energy projects at MEW. Other departments involved in the sector of renewables in MEW are Energy Policy Directorate, and Energy Programming Directorate. The scope of work of the RED includes:

1. Assessing RE potential and preparing detailed resource maps.
2. Preparing provincial level RE master plans.
3. Developing technical designs, benchmarks and performance standards.

¹ These management plans are currently being piloted in 33 sites around Afghanistan by UNEP.

4. Providing technical assistance and oversight to MRRD, DABS and other organisations to design and implement RE projects.
5. Providing technical support to local industry and manufacturers.
6. Providing technology specific and other technical inputs to MOF for designing fiscal incentives, specifically for facilitating investment from the private sector.
7. Designing and implementing pilot and demonstration projects that support either new technology or innovative concepts, for example: i) public-private partnerships; ii) women entrepreneur-led RE projects; iii) RE projects to support MDGs and Post-2015 Development Agenda; and iv) roof-top projects on government buildings.
8. Coordinating with donors and other funding organizations to ensure synergy of projects.
9. Facilitating technical training, awareness generation and capacity building of stakeholders within government and NGOs.

Within the RED, the Biomass Energy Department (BED) is mandated with the development of biomass energy in Afghanistan. The Biomass Action Plan for 2014 was not implemented as a result of budget constraints and is anticipated to be rescheduled for implementation in 2015, including the following priority activities:

1. *Preliminary technical surveys for the installation of biogas projects (Kabul urban, rural and Nengarhar)*
2. *Municipality solid waste power generation in Kabul.*
3. *Biogas plant at RED compound*
4. *Proposal development for donors to implement biogas projects in Kabul and Nengarhar*
5. *Biomass resource maps*
6. *Workshops, seminars and training courses*
7. *Biomass department staff capacity building*
8. *Group projects with other RED departments such as solar, wind and hydro*

- *Ministry of Rural Rehabilitation and Development (MRRD)*

MRRD is mandated to promote rural energy to alleviate poverty and improve the livelihoods of rural households. MRRD's District Development Plans (DDPs) considers rural energy as one of the priority demands of communities. Energy projects at MRRD are implemented through the National Solidarity Program (NSP) funded by UNDP and National Area-Based Development Program (NABDP), Energy for Rural Development in Afghanistan (ERDA). ERDA is being scaled up to a new program called Afghanistan Sustainable Energy for Rural Development (ASERD) by joint initiative of MRRD and UNDP for implementation of sub-component NPP-1 ARD Cluster. ASERD is supposed to start in 2015 and is targeting to provide energy services to about 110,000 households with a budget of USD 190 million over five years. ASERD's main components are energy supply, policy, capacity-building and piloting innovative technologies.

- *Da Afghanistan Breshna Sherkat (DABS)*

DABS is the only independent state-owned utility in the country owning all of the central generation, distribution and transmission assets in Afghanistan. According to a MOU between MEW, DABS and MOF, DABS is responsible for operation and management of power sector in Afghanistan. DABS was part of MEW prior to 2008 as DABM. DABS's does not have a strong focus on rural electrification and is primarily concerned with central grid-connected power generation units.

- *Interministerial Commission for Energy (ICE) and Rural Energy Coordination Committee (RECC)*

The ICE was established by a Presidential Decree in 2006 for the purposes of donor and government stakeholder coordination and harmonizing investment plans in the energy sector. The ICE is chaired by MOEc and its core members are MEW, DABS, MRRD, MOF, and MOMP. The commission is currently in the second phase of implementation, as the work of the commission was temporarily shut down due to funding shortfalls in 2012. Subsequently, Afghan government approached the Asian Development Bank (ADB) for assistance to support the ICE's efforts in coordinating the activities of its energy sector. The ICE was re-established in May 2013 under an ADB project (Project # 46347-

001). Currently the primary functions of the Commission are to support: i) sector discussions; ii) sector planning and harmonization; iii) investment sequencing; and iv) analytical work related to Afghanistan's energy sector.

The RECC and its Technical Working Group (TWG) were established to coordinate the efforts of MEW, MRRD and DABS in the field of rural renewable energy in Afghanistan, as a joint initiative of MEW and MRRD. The RECC and TWG were established in 2012 by the ICE Sub-Committee on Renewable Energy and Rural Electrification with the financial support of GIZ-ESRA programme. Although ICE was temporarily suspended in 2012 as a result of funding shortfalls, RECC continued to receive funding. RECC is chaired by both Deputy Ministers of MEW and MRRD. Currently, RECC has one staff member assigned by GIZ to facilitate the meetings of the committee.

The ongoing work of the RECC+TWG includes the following priority activities for the period 2014 – 2015:

- finalise and approve Rural Renewable Energy Policy;
- finalise and approve Rural Renewable Energy Strategy;
- conduct an awareness workshop of Rural Renewable Energy Policy;
- develop the Standard Questionnaire for developing the Provincial Electrification concept and pave the road for the developing rural Electrification frame work;
- develop the initial Biomass Guideline;
- develop the initial Wind Guideline; and
- enhance the coordination of RECC with other coordination committees.

c.4) National Priority Programmes under ANDS clusters

- *Energy Sector Strategy (EES-2008)*

Energy Sector Strategy (ESS) was developed by the ANDS Secretariat and submitted for approval by sector responsible authorities (within the Ministries of Energy and Water, Rural Rehabilitation and Development, and Mines, respectively) in February 2008. EES was developed for the energy sector under Pillar III of the ANDS (Infrastructure and Natural Resources) to support national objectives for social and economic development. The primary objective of the EES is to increase overall electricity generation, with little emphasis on renewable energies or domestic biomass energy. The EES is based on the following five strategic actions:

9. *Increased Efficiency in Existing Operation*

10. *Improved Sector Governance and Public-Private Partnership Promotion*

11. *Improved Coordination and Capacity Development*

12. *Enhanced Rural Energy and Electrification*

13. *Expanded or New Supply*

However, in the long-term, EES recommends the government to focus more cogeneration, distributed power, renewable energy, end-use energy efficiency and more traditional energy supply schemes. However, the neediest will still gain access to energy through subsidized rates. The following table summarizes some of the main outcomes and activities of EES regarding institutional and policy building in the energy sector:

Table 10. Summary of Energy Sector Strategy (ESS) Action Plan

Outcome	Actions or Activities
<i>An enabling environment for private sector investment in energy sector created</i>	Encouragement to Community Based Natural Resource Management for meeting energy needs of the people.
	Awareness generation of policy makers on the environmental issues so that they are taken care of in all projects in the energy sector.
	Establishment and operation of a regulatory authority
	Private sector promotion in renewable energy
	To maintain the highest level of transparency, accountability and integrity in the relationship between the public and private sector.
	Gender mainstreaming in the policies in the energy sector.
<i>Increased Access to Rural Energy Services</i>	Link rural energy with micro and small finance programs
	Develop a comprehensive and appropriate rural energy program
	Public awareness on rural energy opportunities, benefits, funding
	Assessment of priority areas based on income-generation opportunities
	Special attention to gender issues in providing energy for rural areas.
<i>Restructured Energy Sector Governance and Commercialized operations</i>	Establishment of viable ICE working groups
	Improved GoA, Donor & NGO Coordination
	Needs Assessment and Data Base
	Define Government roles in clearly defining TORs for MRRD and MEW on rural energy aspects
	Develop and implement the organizational structure and staffing plan for Rural Livelihoods and Energy Department (RLED)

▪ *National Energy Supply Program (NESP-2013)*

NESP is one of the 22 National Priority Programs (NPPs) that was agreed upon at the Kabul International Conference¹ in 2010. NESP is one of the four NPPs under the Infrastructure Development Cluster. NESP tries to show the impacts of investment in the energy sector especially in the electricity subsector on the economic development of Afghanistan. MEW is the primary executing ministry of NESP. However, MEW is expected to coordinate and cooperate with other related ministries and institutions such as DABS, MRRD, MAIL and NEPA. The main goal of NESP is to prepare and implement activities toward increased energy access and sufficient, reliable and affordable energy especially electrical energy.

NESP has identified five major areas of investment in the energy sector and MEW is responsible to report progresses made to the review program coordination board and Joint ordination and Monitoring Board (JCMB). NESP is planned to be implemented during the period of Jan 2013–Dec 2014. The cost for the plan is estimated as ~USD 3.5 billion, to be implemented through the following five components:

1. Energy Supply (US\$1.9 billion)
2. Energy Transmission and Distribution (US\$1.01 billion)
3. Energy Efficiency and Renewable Energy (US\$59 million)
4. Energy Institutions and Private Sector Participation (US\$334 million)
5. Capacity and Regulatory Framework Development (US\$135 million).

With regard to improving institutional, policy and regulatory frameworks, NESP outlines specific activities under components 4 and 5. Some of the key outputs of components 4 and 5 are outlined below:

¹ The Kabul Process was an international tripartisan conference between the national government, the United Nations and the International Community. A key outcome of the conference was to articulate and operationalise the National Priority Programs (NPP) as part of the Afghan National Development Strategy (ANDS).

- The restructuring of energy institutions
- Building regulatory and policy frameworks to support private sector participation
- Building personal and institutional capacities of energy sector employees (DABS, MEW and MRRD staff) and the staff of the private sector entities
- Establishing a strong coordination, oversight, communication and management mechanism in the energy sector
- Building the educational capacities of universities and vocational training centers
- *National Water and Natural Resources Development Program (NWNRD)*

NWNRD is one of the four NPPs under Agriculture and Rural Development Cluster (ARD). The goal of NWNRD program is to ensure the effective utilization of water and other natural resources and their proper management to foster agricultural productivity, safe drinking water and viable rural energy options. One of the main objectives of NWNRD program is to improve energy access in rural areas in order to improve livelihoods and create new sustainable jobs. The following are the two components and sub-components of NWNRD:

1. Water Resources and Irrigation Development
2. Environmental Management and Rural Energy

1.2 Rationale

Baseline projects and investments for the next 3-5 years addressing the identified GEB threats and causes and development of the CC vulnerable sector (main co-financing sources of the project)

a) Baseline projects

The project will build upon six ongoing initiatives which are addressing the underlying global environmental problems described above, including both government programmes as well as ongoing initiatives led by non-governmental organisations. The four ongoing governmental departments that are providing baseline co-financing commitments include NEPA, MAIL, MRRD and MEW. In addition, the project will benefit from the baseline investments of the NGOs, BORDA and MADERA.

1. Afghanistan Sustainable Energy for Rural Development (ASERD) is a joint initiative of MRRD and UNDP to implement sub-component NPP-1 ARD Cluster. ASERD will be implemented in 2015 with the initial target of providing energy services to about 110,000 households with a budget of USD 190 million over five years. MRRD is mandated to promote rural energy to alleviate poverty and improve the livelihoods of rural households. MRRD's District Development Plans (DDPs) considers rural energy as one of the priority demands of communities. The main components of ASERD will include energy supply, policy, capacity-building and piloting innovative technologies. The ASERD programme will build on the capacity and investments established by past and ongoing programmes implemented through MRRD (described further below) and will apply similar implementation modalities. The ASERD programme has been launched in 2015 with an annual operating budget of US\$400,000 from government budgets. No bilateral funding commitments have yet been finalised, however the total estimated budget for the ASERD programme is anticipated to be approximately US\$ 190,000,000 for the following Outcomes: Outcome 1: Rural Energy Services; Outcome 2: Policy and Regulation; Outcome 3: Innovative Delivery Models; Outcome 4: Capacity Development and Outreach. The FAO GEF project is particularly aligned with Outcome 1, 2 and 4 of ASERD. The baseline co-financing available to this GEF project from the ASERD programme is equivalent to at least US\$1,200,000 of the ministry's operational budget over the project implementation period.

The ASERD programme is also supported by the following two MRRD initiatives:

- The **National Area-Based Development Programme (NABDP)**, also described previously, is a large-scale national rural development initiative and a permanent programme of the MRRD. Operating through seven regional offices, the NABDP focuses on establishing District Development Assemblies (DDAs) and training them in good governance practice and infrastructure project planning and implementation skills. This then promotes service delivery and livelihood diversification through the improvements in the capacity of district-level governance and infrastructure. The principle focus of

the NABDP is on: i) developing local capacity and institution-building for governance by district- and village-level structures; and ii) developing productive rural infrastructure such as transport, energy and agricultural facilities. Two of the cross-cutting issues of the NABDP are natural resource management and energy for rural development. In alignment with national priorities for agricultural and rural development strategy, the objective of the NABDP is to function as an economic regeneration programme with a focus on the development of productive rural infrastructure across Afghanistan. Based upon the third pillar of the ANDS (Social and Economic Development), NABDP addresses two thematic areas: i) institutions strengthened at the district level to independently address priority local needs; and ii) rural poor have improved access to key services. NABDP is also aligned with the National Priority Programme (NPP) Four: “Strengthening Local Institutions” and NPP One: “National Water and Natural Resources Development” (both under the Agriculture and Rural Development Cluster).

The most recent phase of the NABDP, Phase II (2009 – 2014), was facilitated by UNDP with a budget of ~US\$295 million funded by nine European countries. Of this amount, \$4 million was allocated for activities in the priority provinces in which the GEF Project will be operating, including the development of renewable energy under the Energy for Rural Development in Afghanistan (ERDA) sub-project. To date, the NABDP has established 388 DDAs in 34 provinces, of which 293 DDAs in 33 provinces received Grant-in-Aid, including organisational and physical capacity supports. With respect to the proposed pilot provinces for this GEF project, the NABDP has completed 236 projects in Nangarhar, costing US\$13,844,471, creating 437,510 labour days, and benefiting 1,552,415 people. There are a further 20 ongoing projects in the province, with a combined budget of US\$1,854,878, expected to generate a further 67,852 labour days and benefit 176,599 people. The NABDP has completed 49 projects in Parwan, costing US\$3,862,300, creating 125,337 labour days, and benefiting 401,022 people. There are a further 14 ongoing projects in the province, with a combined budget of US\$1,157,103, expected to generate a further 34,818 labour days and benefiting 89,361 people.

The NABDP supports sub-national governance and resource management of all rural sectors by supporting the establishment and building the capacity of DDAs. At present, the scope of activities undertaken by communities under the NABDP includes activities related to renewable energy as well as natural resource management. Consequently, the structures and capacity established by the NABDP provides a platform for promoting improved natural resource government and use of biomass fuels through communities. However, the focus of NABDP on renewable energy-related projects, through the ERDA programme, mainly emphasises technologies such as solar and hydropower. Although some biogas projects have been undertaken in the past, there are relatively few examples of biomass energy-related initiatives undertaken through the NABDP. With respect to natural resource management, the majority of activities selected by communities tend to focus either on agriculture-related interventions or alternatively disaster risk reduction through NRM such as as revegetation of landslide-prone areas. Consequently, there are strong existing skills and capacity within MRRD technical staff and communities trained through the NABDP, however there is relatively little practical experience or awareness of the approaches that will be promoted through this GEF project (e.g. CBNRM, SBES). GEF investments will support MRRD to include planning and management of natural resources and household access to energy within the ongoing activities of rural development initiatives. Furthermore the capacity of communities participating in NABDP to plan and implement related initiatives within ongoing local development planning will result in sustained environmental and social benefits as well as a net reduction of GHG emissions from participating communities.

- The **National Solidarity Programme (NSP)** was established to support Afghan communities to identify, plan, manage and monitor their own development projects through the establishment and training of CDCs. The NSP provides a block grant to each community with an established CDC and a detailed CDP, which is utilised for community-prioritised infrastructure sub-projects. The block grant is disbursed in tranches into bank accounts owned and operated by the CDC on behalf of the

community¹. By September 2015, the NSP aims to have established ~39,056 CDCs and provided them with the first round of block grants. The block grant is determined by the number of families in a community (AFA 10,000 per family, or ~USD 165), with a maximum ceiling of AFA 3 million per community. The entire community's block grant entitlement needs to be committed into one or two approved sub-project proposals, and disbursements are then made in tranches of 90% and 10% into a bank account owned and operated by the CDC on behalf of the community². By September 2015, the NSP aims to have established ~39,056 CDCs and provided them with the first round of block grants. Furthermore, 12,000 selected CDCs will receive a second round of block grants³. There are 605 CDCs in Nangarhar Province, 36 of which represent the 52 villages covered by the NSP⁴ (out of a total 75 villages) in the Dara-e-Noor District – as of 2012⁵. In Parwan, there are 505 CDCs, of which 44 are found in Salang District⁶. In Nangerhar, the average number of families represented within a CDC is 230, ranging from a minimum of 55 families up to a maximum of 335. In Parwan, the average number of families represented within a CDC is 130, ranging from a minimum of 60 families up to a maximum of 400.

Another role of the NSP is to link CDCs to appropriate government agencies, NGOs, and donors to improve access to services and resources⁷. The NSP has contracted over 30 facilitating partners (FPs) to support the communities in NSP field implementation. The roles of the FPs include the establishment and capacity building of the CDCs, and the oversight, monitoring and technical assistance in the planning and implementation of the communities' subprojects financed by the NSP block grants⁸.

The total NSP budget for the period from May 2003 to September 2015 (not including community contributions) amounted to US\$2.5 billion. The total expenditure as of August 2014 was US\$2.04 billion, divided into the following core components⁹:

- Component 1 – Establishment and capacity building of CDCs (i.e. all FP costs): US\$339 million (16.63%);
- Component 2 – Community grants for economic and social development (all block grant costs): US\$1.51 billion (74.23 %);
- Component 3 – Project implementation support (all non-block grant and non-FP costs): US\$186 million (9.14 %).

2. The National Environmental Protection Agency (NEPA) of the Government of the Islamic Republic of Afghanistan is the primary agency mandated with the sustainable management of Afghanistan's environment under Article 15 of the national Constitution and Environment Law. NEPA is engaged in the development and implementation of national responses to diverse environmental and social issues including natural resource management, air quality, and climate change. The objectives of NEPA's ongoing activities related to promotion of sustainable natural resource management through field-based activities includes: i) community-based management of forests and natural resources in two pilot provinces; and ii) demonstration of appropriate technologies

¹ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

² Ibid.

³ Ibid.

⁴ UNDP/MRRD. 2012. Summary of district development plan: Dara-e-Noor District, Nangarhar Province. Available at: <http://www.mrrd-nabdp.org/attachments/article/399/Dara-e-Noor%20Summary%20of%20District%20Development%20Plan.pdf>. Accessed on 1 December 2014.

⁵ NABDP Nangarhar Provincial Profile 2012. Available at: [www.mrrd-nabdp.org/attachments/article/244/Nangarhar Provincial Profile.pdf](http://www.mrrd-nabdp.org/attachments/article/244/Nangarhar%20Provincial%20Profile.pdf). Accessed on 01 December 2014

⁶ NABDP Parwan Provincial Profile 2012. Available at: [www.mrrd-nabdp.org/attachments/article/249/Parwan Provincial Profile.pdf](http://www.mrrd-nabdp.org/attachments/article/249/Parwan%20Provincial%20Profile.pdf). Accessed on 01 December 2014

⁷ NSP Basic Introduction. 2014. Available at: <http://www.nspafghanistan.org/default.aspx?sel=109>. Accessed on 1 December 2014.

⁸ Ibid.

⁹ Ibid.

and approaches for efficient use of biomass fuel in domestic households. Furthermore, NEPA is the agency mandated with GoIRA's response to climate change and in consequence this agency is particularly relevant to the objective of reducing greenhouse gas (GHG) emissions from the sectors of land use change and domestic energy, respectively. These activities, combined with the agency's ongoing efforts to increase public awareness on the topics of environmental protection and climate change, provide a foundation of experience and skill that will support the implementation of the GEF project. NEPA will support the GEF project with a commitment of in-kind baseline co-finance support of approximately US\$500,000 over the project implementation period, derived from NEPA's operational budget.

3. The Ministry of Agriculture, Irrigation and Livestock (MAIL) is mandated with the management of Afghanistan's productive rural sectors and natural resources such as forests and rangelands. MAIL's activities are guided by the National Priority Programmes the Agriculture and Rural Development Cluster, such as the **National Water and Natural Resources Development Program (NWNRD)**. The NWNRD is one of the four NPPs under Agriculture and Rural Development Cluster (ARD). The goal of NWNRD program is to ensure the effective management and use of water and other natural resources under the sub-components of: i) Water Resources and Irrigation Development; and ii) Environmental Management and Rural Energy. Under the national Forest Law, MAIL is responsible for the management of Afghanistan's forests unless management rights are formally decentralised to a democratic community-based structure such as a Forest User Association. In the latter respect, the responsibilities of MAIL include supporting the design and implementation of natural resource/forest management plans in participation with community-based Forest User Associations. However, both within ministerial technical staff and at the level of local communities, there is a lack of capacity and expertise to undertake basic activities related to management and monitoring of natural resources, and consequently the implementation of community-based forest management remains limited. The abovementioned activities and investments of MAIL will provide a foundation of capacity, expertise and community-based governance structures that will support the implementation of the FAO GEF project. MAIL will support the GEF project with in-kind baseline co-financing commitments derived from operational budget for the NWNRD programme, and will amount to approximately US\$1,000,000 over the GEF project's implementation period.

4. The Ministry of Energy and Water (MEW) is mandated with the management of Afghanistan's energy needs, including the development of policies and plans to increase energy access as well as the implementation of large-scale electrification and energy infrastructure. The main roles of MEW in developing the renewable energy sector in Afghanistan are to prepare policies, strategies, action plans and laws, create a platform for decision-making, implement renewable energy projects and help other developing agencies with security, land acquisition and licensing issues. Within MEW, the Renewable Energy Department (RED) is the department mandated with the development of electricity generation using renewable energy technologies. Within RED, the **Biomass Energy Department (BED)** was established to develop the potential of biomass energy to contribute to national renewable energy mix.

The priority activities for the BED under the Biomass Action Plan for the upcoming year commencing is likely to include:

1. Preliminary technical surveys for the installation of biogas projects (Kabul urban, rural and Nengarhar)
2. Municipality solid waste power generation in Kabul.
3. Biogas plant at RED compound
4. Proposal development for donors to implement biogas projects in Kabul and Nengarhar
5. Biomass resource maps
6. Workshops, seminars and training courses
7. Biomass department staff capacity building
8. Group projects with other RED departments such as solar, wind and hydro

It is anticipated that MEW will contribute to development of policies and strategies to strengthen the institutional environment to promote sustainable biomass energy within Component 1 of the proposed

project. Furthermore MEW will assist with the identification and promotion of appropriate biomass energy technologies and potential opportunities to sustain the project's activities beyond the implementation period. MEW will benefit from financial and technical assistance, including technical capacity building of MEW staff, to promote and implement biomass energy technologies. The FAO GEF project will support the priority activities of the Biomass Action Plan (above), most directly 1), 6) and 7). The abovementioned activities and investments of MEW will provide a foundation of capacity and expertise in development of renewable energy that will support the implementation of the FAO GEF project GCP/AFG/082/GFF entitled "Reducing GHG Emissions through Community Forests and Sustainable Biomass Energy". The GEF project will support the baseline activities of MEW, particularly within the Biomass Energy Department, on activities related to: i) promotion of sustainable biomass energy in rural areas; ii) increasing the availability of information and data to support future promotion of sustainable biomass energy and natural resource management; and iii) implementation of project activities with the participation of democratic community-based governance structures in the form of DDAs and CDCs. The baseline co-financing committed by MEW's BED will amount to approximately US\$500,000 during the period of the GEF project's implementation.

5. The ongoing activities of programmes implemented by the NGO Mission d'Aide au Développement des Economies Rurales en Afghanistan (**MADERA**) – including the **Central Highlands Rural Development Programme** (CHRD) – provide an important baseline for the investments of this GEF project. MADERA is an international organisation that has been promoting rural development in Afghanistan since 1988. The organisation has an annual budget of ~Euro 3.6 million (USD 4.4 million), which is used to implement rural development interventions to rebuild the food production capacity, improve the quality of agricultural and horticultural products, and increase the incomes of rural Afghans people. Examples of these interventions include establishing motherstock nurseries and nursery associations, distributing certified seeds, providing training in a variety of topics, supporting NSP initiatives, and implementing agroforestry activities. These agroforestry activities include reforestation and establishing forest management committees, but have been suspended since 2013 due to a lack of funding.

As part of its 2014–2017 strategic plan, MADERA aims to collaborate with complementary forestry and CBNRM projects to re-establish the agroforestry and CBNRM interventions that were suspended due to lack of funding in 2013. These include pasture management, regeneration of test plots and piloting participatory planning tools for land use, currently being tested in Wardak province.

MADERA, as a facilitating partner of the NSP, has supported 1267 CDCs to implement community projects throughout Afghanistan. It is anticipated that MADERA will work with an addition 435 CDCs in 2015. The organisation has been active in the Eastern regions of the country since 1988 and built an extensive network of community partners and stakeholders. MADERA plays a leading role in a consortium of NGOs collaborating with the Afghan National Nursery Growers' Organisation (ANNGO) to support fruit-tree nurseries (See Appendix 13 for a list of ANNGO nurseries in Nangarhar and Parwan). In 2011, MADERA began implementing a forestry management programme integrated with livestock and farming activities, in line with the National Development Strategy adopted in 2008. The implemented activities aimed at improving the livelihoods of people while addressing deforestation and the conservation of forest resources. Besides environmental actions, income-generating activities, improved agricultural production and livestock management are also undertaken to enhance the natural resources of the region.

One of the ongoing projects of MADERA's includes the CHRD. The CHRD is being implemented in Bamyan and Wardak Provinces in the period 2014–2017 through MADERA and two other NGOs, Solidarités International and GERES. The programme is funded by the French Development Agency (FAD). Within this project, MADERA supports animal health service providers and implements practices for improved pasture management and livestock feeding practice activities with local communities in three districts (Behsud I and II in Wardak, and Yakawlang in Bamyan). The project concentrates on the promotion and of the communities' role and enhanced capacity in territorial protection and management. The project mainly focuses on community-based management of natural

resources in relation to high-altitude pastures, irrigation and/or drinking water through the following components: i) agriculture and livestock management; ii) increased household energy availability and resilience; iii) natural resource management; and iv) capacity building.

The proposed GEF-project is well positioned to collaborate with MADERA in this sector, making use of its extensive networks and relationships with local communities and sub-national governance structures. The GEF project will add incremental benefits to MADERA's ongoing work by re-integrating community-based forestry and sustainable household energy into the NGO's scope of activities with a particular focus on mitigating against climate change and reducing net GHG emissions. The ongoing activities and investments of the MADERA programme in Afghanistan, including the CHRDP, will support the GEF project with a baseline co-financing commitment of approximately US\$116,114 over the period of the GEF project's implementation.

6. Finally, the ongoing activities of the **Bremen Overseas Research and Development Association (BORDA)**, a German NGO concerned with poverty alleviation, sustainable protection of natural resources and the strengthening of social structures. The organisation's objective is to improve the living conditions of disadvantaged communities, while keeping the environment intact, through the expansion of basic needs services. The following represent the current focus of BORDA's projects¹:

- decentralised water supply in mountainous areas;
- decentralised energy supply in mountainous areas;
- decentralised wastewater management in poor communities and public institutions;
- community-based sanitation in poor urban areas; and
- decentralised solid waste management in poor, densely populated urban districts.

BORDA began working in Afghanistan in 2011, implementing the Vocational Training for Small-Scale Entrepreneurs (VTSSE) project – Delivering Sustainable Decentralised Basic Sanitation and Wastewater Management in Kabul, Kunduz, and Herat. The objective of the project was to build Afghan capacities to implement basic sanitation and decentralised wastewater treatment. The expected outcomes of the VTSSE are: i) at least 120 artisans and small-scale entrepreneurs have been trained, thereby setting up service structures for planning and constructing small wastewater treatment plants and sanitation facilities; ii) at least 3,000 people have benefited from demonstration and training projects in poor communities; and iii) project packages for decentralised wastewater treatment and basic sanitation have become a component of communal development projects and receive support from international donor agencies².

The total project turnover for the period 2011-2014 was ~1,002,995 Euros. After the first two project years, the following intermediate results have been achieved³:

- Four pilot sanitation projects completed, with a further two nearing completion;
- Over 100 brick-layers, 12 site managers, and 22 engineers have been trained in Kabul, Jalalabad, and Mazar-e-Sharif;
- Approximately 5,680 people have gained access to improved basic sanitation;
- Fifteen people employed producing decentralised water treatment plants; and
- Approximately 116,275 m³ of water treated per day through BORDA interventions.

As part of its mandate to provide access to electricity to remote rural villages – making use of local energy sources – BORDA has implemented a number of biogas initiatives in Bamyan Province. Fifteen biogas plants were expected to be completed in the province by the end of 2014⁴. Furthermore,

¹ BORDA. 2008. Policy Paper: Dissemination of decentralised basic needs services. Available at:

http://www.borda-net.org/fileadmin/borda-net/Knowledge/Generell%20Docs/policy_paper_%255Ben%255D.pdf. Accessed on 10 December 2014.

² BORDA. 2013. Annual Report 2012/2013. Available at: http://www.borda-net.org/fileadmin/borda-net/Knowledge/Annual%20Reports/BORDA_AnnRep12_13_web.pdf. Accessed on 10 December 2014.

³ Ibid

⁴ Ershad, A. Pers. Comm. 09 December 2014.

BORDA was instrumental in the establishment of Afghanistan's Biogas Consortium in October 2014. The Biogas Consortium is a partnership between organisations that aims to promote, contribute to, and learn about the sustainable development of biogas in Afghanistan. The Consortium was initiated to ensure the sustainable implementation of biogas digesters in Afghanistan, as well as to act as a knowledge hub to inform interested parties, policies and planners in best practices, socio-economic aspects and to consolidate and disseminate lessons learnt from the development of biogas in Afghanistan¹. The ongoing activities and investments of the BORDA programme in Afghanistan will support the GEF project with a baseline co-financing commitment of approximately US\$450,000 over the period of the GEF project's implementation.

b) Remaining barriers to address threats on GEB (for GEF Projects) / CC vulnerabilities (for LDCF/SCCF projects)

As described above, the sustainable and equitable management of natural resources – notably including forests, rangelands and other economically productive ecosystems – is recognised by GoIRA as an urgent national priority. The perceived importance of sustainable Natural Resource Management (NRM) practices is reflected in national policies and development strategies, most notably the ANDS and within multiple pillars of the NPP. Furthermore, Afghanistan recognises the potential for improved and sustainable NRM practices to generate environmental and socio-economic benefits for local communities and as a result, national policies have been developed to promote the decentralisation of NRM to community-based structures. The establishment of the National Environmental Protection Agency (NEPA) and the subsequent progress in national environmental governance further indicates a clear political will to protect and enhance the country's natural heritage. However, despite the existence of clear and progressive policies to promote sustainable community-based management of forests and other natural resources in Afghanistan, there are multiple barriers that prevent the effective implementation of these policies (described in further detail below). Several previous and ongoing projects in the country have included activities that promote CBNRM, for example within the project portfolio of bilateral agencies such as FAO and UNEP, international partners such as USAID, and NGOs such as MADERA and BORDA. However, although these past initiatives have established some capacity and lessons learned to support future CBNRM projects, in general the approach to CBNRM is *ad hoc*, uncoordinated and not yet integrated into sub-national priorities and planning.

Furthermore, while the promotion of access to energy is recognised as an urgent need to foster socio-economic development, at present the majority of rural households remain reliant on biomass-based fuels such as firewood, charcoal and animal dung as the primary domestic energy source. The promotion of decentralised renewable energy is the primary strategy to increasing rural energy access, however at present the national priorities on renewable energy are primarily focused on small-scale electrification using hydropower and solar technologies. Consequently, there is relatively little promotion of, or awareness of, household-level energy systems that use biomass fuels more efficiently. Finally, although Afghanistan is increasingly aware of the global challenges related to climate change, including the need to develop strategies for mitigation and adaptation, at present there is no explicit national strategy on climate change. Mitigation of climate change is an emerging topic in the country and there are no established targets or mechanisms for reducing GHG emissions in response to climate change.

The activities and outcomes of the proposed GEF project are designed to address the above challenges by promoting and demonstrating practices for implementing community-based forestry and NRM coordinated with the promotion of sustainable biomass energy systems (SBESs). In particular, the project will target specific institutional and technical barriers to achieve the project objective, detailed further below.

¹ Biogas Consortium Afghanistan officially launched. 16 October 2014. Available at: <http://www.borda-afg.org/news/newsdetails/article/biogas-consortium-afghanistan-officially-launched.html>. Accessed on 10 December 2014.

1. Lack of coordination at the level of institutions and policies to promote sustainable use of biomass energy and natural resources

The institutional framework that governs national priorities and policies on energy are strongly supportive of the promotion of renewable energy. In particular, MEW and MRRD are active in promoting and increasing access to renewable forms of electrification and off-grid renewable energy, and a number of newly developed policies have been developed based on international best practice for renewable energy governance. However, in general the emphasis of national priorities related to energy has a strong focus on renewable energies such as hydropower and solar energy and does not include a strong focus on biomass-related energies despite the widespread reliance on biomass energy throughout the country. The draft Renewable Energy Policy includes mention of sustainable biomass energy as a priority area for further development in the future, however there are no binding national targets or objectives related to promotion of sustainable biomass energy use. As a result, in the absence of policies to promote sustainable use of biomass energy, at present there is very little investment, technical capacity and awareness to support approaches for sustainable biomass energy use, such as promotion of SBES.

Climate change is broadly recognised as a challenge to the sustainable development and wellbeing of Afghanistan's population and GoIRA is actively participating in international conventions related to climate change. Capacity to address climate change at the policy level has been built through the investments of past and ongoing initiatives, notably the LDCF1 and LDCF2 projects implemented through UNEP which have included a strong focus on developing capacity for climate change and NRM within NEPA and MAIL. Furthermore, the establishment of National Climate Change Committees by NEPA provides some institutional framework for developing climate change-related policies and priority activities. However, although the national institutional framework for climate change has been strengthened considerably in the last decade, at present there is no explicit national policy for climate change mitigation and there are no strategic actions to be prioritised with the objective of mitigating climate change. In general, at the level of sub-national government and technical government extension staff, there is a low level of awareness of potential options for climate change mitigation through activities such as sustainable forest management and efficient use of biomass energy. Activities for climate change mitigation are not included in development planning, neither at the level of national planning nor at the level of provincial and district priority plans.

Consequently, at present there are no national priorities or goals related to climate change mitigation. The potential contribution of practices such as sustainable NRM/forestry and efficient use of biomass energy to mitigating globally harmful GHG emissions are not recognised. As a result, the selection of activities to be prioritised within national development planning, particularly in the LULUCF sector but also in general, does not include consideration of GHG abatement or potential mitigation of climate change.

→ *This barrier will be addressed by project Outcome 1.*

2. Limited technical capacity at the sub-national level to coordinate and monitor community-based NRM and SFM plans

In the baseline, the provincial departments of MAIL (DAIL) are mandated to support the decentralisation of management of community- and state-owned forests¹ to community-based Forest Management Committees in alignment with the Forest Law (2011) and Environmental Law (2007). The National Forestry Management Plan (2012) identifies the promotion of CBNRM as a priority objective (Objective 2: Implement practical environmental conservation and management interventions designed and implemented on the basis of CBNRM approaches). Nationally, the provincial departments of MAIL have collectively reported the establishment of ~361 FMCs in 13 provinces².

¹ This does not include forests on private land.

² UN Forum on Forests (2012). http://www.un.org/esa/forests/pdf/national_reports/unff10/Afghanistan.pdf.

At the provincial level, DAIL is well-represented by technical staff and district-based extension officers with experience in providing technical support to communities. However, the practice of designing and implementing integrated CBNRM planning through FMCs remains an emerging practice in Afghanistan and in consequence there are relatively few DAIL staff who have had practical experience in working with communities to establish FMCs and implement CBNRM plans. Furthermore, as a result of infrastructural and security challenges, the availability of DAIL extension services to communities is highly variable at the district and provincial level. Consequently, the availability of technical extension staff with practical experience in sustainable forest management (SFM) and CBNRM-related is also highly variable between districts and provinces. MAIL identified the following institutional capacity gaps and barriers to SFM, *inter alia*: i) limited awareness of the value of SFM at the local level; ii) limited funds and technical staff to support awareness raising and technical; iii) limited alternatives to woodfuel use and timber harvesting; and iv) a need for technical expertise in natural forest regeneration, silviculture, watershed management, and sustainable tree harvesting practices¹.

An additional technical challenge is the lack of a harmonised protocol or training tool for DAIL and NEPA extension officers to provide guidance and training to FMCs on principles such as sustainable harvesting techniques and forest inventories. As a result, despite the establishment of several CBNRM management plans through previous national and bilateral initiatives, there is no consistent protocol for monitoring and evaluating the impacts of the long-term management of natural resources by communities. The corresponding absence of data on % forest cover, growth rates, extraction rates and standing biomass is a barrier to: i) providing national level decision-makers with high quality information which quantifies the socio-economic and environmental impacts of SFM and CBNRM practices; and ii) prevents the establishment of sub-national forest monitoring, inventories and reference level GHG emission data. There is a need for a centralised information system to coordinate and compile existing and future information related to forest productivity, particularly from areas which are managed by decentralised community structures.

As a result of the abovementioned capacity barriers, it is likely that the planning and implementation of community-based forestry and NRM is likely to be undertaken in an uncoordinated and *ad hoc* fashion. Furthermore, the absence of a system for monitoring the condition and productivity of forests, both those under community-based and government management systems, is a barrier to the establishment of GHG inventories for the LULUCF sector, for example in preparation of national communications to the UNFCCC. Finally, the barriers to estimating GHG emissions from the LULUCF sector will limit the ability of Afghanistan to access financing from international markets for forest carbon through mechanisms such as REDD+, the CDM and various voluntary carbon markets.

→ *This barrier will be addressed by project Outcome 2.*

3. Limited adoption of non-traditional methods of cooking and heating, particularly with respect to efficient biomass-based energy systems

In the baseline, one of the primary development goals of GoIRA is to increase household access to electricity, both by increasing access to the national grid and by promoting off-grid electrification in rural areas. Remarkable success has been achieved in this regard, where the number of households with access to electricity has increased at a rate of ~8.7% per year.

The GoIRA and the international community have also made considerable investments in promoting and increasing access to renewable energy, with a particular emphasis on hydro-electricity and solar power (which includes ~13 MW of solar PV, ~36.7 MW of micro-hydro power and ~200 KW of wind power contributing to Afghanistan's decentralized generating capacity.). The focus of national priorities and plans related to renewable energy within the aforementioned ministries has focus largely on development of infrastructure for hydro- and solar-electricity facilities. As a result, to date there has

¹ UN Forum on Forests (2012). http://www.un.org/esa/forests/pdf/national_reports/unff10/Afghanistan.pdf.

been relatively little emphasis in public education and sub-national planning to promote efficient use of biomass energies.

As a result, it is anticipated that household access to electricity will continue to increase at a national level. However, in certain rural districts – particularly those where the access of public extension services to communities is constrained by resources, infrastructure and security – the installation of on- and off-grid electrification is challenging or unfeasible in the mid-term. As a result, it is likely that biomass-based fuels are likely to remain the only energy option for a significant number of rural households for several decades to come. Furthermore, even for urban households with access to electricity, the considerable household demands for heating during winter are generally supplemented by woodfuel.

In recognition of the urgent need to address the unsustainable rates of biomass use, a number of past initiatives have demonstrated SBESs such as biogas, improved cooking stoves, solar cookers and fuel-efficient *bhukari* heaters. However, possibly due to the logistic challenge of ongoing monitoring and evaluation, there is relatively little information available to assess the effectiveness and adoption rate of these technologies. For example, it is estimated that over 1,000 biogas digesters have previously been installed in Afghanistan¹, however the number which are still operational is not known. In consequence, there is an absence of summarised best-practices and examples of successful approaches to guide sub-national decision-makers and government extension staff on the potential role of SBES in energy planning.

→ *This barrier will be addressed by project Outcome 3.*

4. Limited public awareness and availability of data, tools and planning materials to inform community-based natural resource management, forestry and sustainable biomass energy systems

Initiatives which include a focus on activities such as CBNRM, SFM and SBES are hindered by the limited availability and accessibility of local data and information to inform results-based management. For example, the availability of baseline information on national and sub-national deforestation rates, biomass carbon content and productivity of various vegetation types is very limited. Consequently, there is inadequate information available to support detailed and accurate monitoring of forests and natural resources, for example within a sustainable harvesting programme or a carbon credit-generating programme using approaches such as REDD+. Furthermore the existing data, information and protocols generated by previous initiatives are not systematically compiled and disseminated through a central forum e.g. a publicly accessible internet website or information hub. As a result it is common for projects to duplicate efforts and to be implemented without the full benefit of information generated by previous initiatives. There is an urgent need for improved quality and accessibility of data, information and best-practice guidelines to support future initiatives and remove knowledge barriers in sectors such as forestry, natural resources, and biomass energy.

Furthermore, in addition to the lack of accessible data to inform evidence-based decision-making, there is a low level of public awareness of the importance of sustainable use of biomass resources. Adoption of improved approaches for management of natural resources and biomass is relatively limited and confined to areas which have benefited from financial support and demonstration of alternative approaches. Efforts to increase public awareness on these topics is exacerbated by challenges such as variable literacy, limited accessibility, and availability of awareness-raising materials through appropriate media. At present the limited information available on previous initiatives and technologies related to biomass energy is uncoordinated and is not available through a centralised information system.

² USAID. 2013. Performance Evaluation: improving livelihoods and governance through natural resources management (ilgnrm) project, Afghanistan. Accessed on 31 October 2014. Available at: https://www.academia.edu/7808374/Performance_Evaluation_improving_livelihoods_and_governance_throu_gh_natural_resources_management_ilgnrm_project_Afghanistan

→ *This barrier will be addressed by project Outcome 4.*

c) Incremental/additional reasoning (added value of the project in particular the GEF financing)

The GEF project will add incremental benefits to the existing baseline scenario and ongoing baseline projects by implementing multiple activities targeting the barriers described above. In particular, the proposed project's activities will focus on addressing the barriers to mitigating against climate change through sustainable, community-based management of forests and through promotion of efficient, sustainable biomass-based energy systems (SBES). The approach of the proposed project is to build on existing baseline investments in information, capacity and institutional strengthening as a foundation for demonstration of the project's activities. In particular, the existing capacity within sub-national government – in the form of DDAs, CDCs and FMCs – will provide a foundation for community-driven selection and implementation of activities. Ongoing initiatives with a focus on promoting renewable energy will provide a foundation for promotion of improved approaches and technologies for efficient use of biomass.

The GEF project will integrate climate change mitigation into the ongoing activities of baseline projects, particularly by promoting the GHG abatement potential of sustainable management of forests, rangelands and other ecosystems through community-based structures. The integration of climate change mitigation into the ongoing activities of these baseline projects will focus primarily on: i) reduced emission of GHGs, through conservation of existing ecosystem carbon stocks in community-managed forests and rangelands; ii) reduced emission of GHGs through increased efficiency of biomass use in SBES; and iii) increased sequestration of GHGs through improved management and reforestation/afforestation of community-managed forests and rangelands. These activities will be supported with multiple capacity-building and training activities at national, provincial and local level. Furthermore, the project will overcome the barriers related to accessibility and availability of data, tools and planning materials by undertaking and disseminating rigorous scientific research on the approaches and technologies demonstrated by the project. This research will support the establishment of reference-level emissions and emissions savings as a result of the project activities, which will support monitoring of this project and will provide useful information to support future related initiatives. Knowledge products generated by the project, including research as well as training tools and policy briefs, will be hosted on a publicly accessible online platform.

Component 1: Strengthening the national policy environment to support sustainable biomass energy systems (based on CBNRM), laying the groundwork for investment promotion and future access to carbon markets

Without the GEF project, the limited focus of existing policies and sectoral strategies that relate to CBNRM and renewable energy, respectively to promote solar and hydropower will continue to be a barrier to promote improved practices for biomass energy use. In addition, most attention is currently given to centralised power generation to address the country's current shortage of electricity provision to households, with no national awareness of the benefits of renewable energy systems, especially on a small scale. In particular, the benefits of SBESs for rural energy, conservation and development have not been examined and promoted nationally. Consequently, without the project activities, it is likely that SBES planning will not form an integral part of national planning. Activities under Outcome 1 will therefore support the integration of approaches proposed by the project, particularly promotion of SBESs and CBNRM, into national policies and practices as a strategy for socio economic development and building community resilience. This Component of the project will primarily add incremental benefits to the baseline situation by targeting institutional, policy and capacity barriers related to SBES and CBNRM at a national level.

Component 2: Developing community-based natural resource management (CBNRM) plans and establishing community forests in 2 project areas

Without the GEF project, the limited technical capacity and low level of awareness will continue to be a barrier to establishing FMCs and assisting them to design and implement CBNRM plans. Consequently, the management of forested areas and other natural resources is likely to remain centralised through MAIL while the decentralisation of NRM to communities will only be implemented in a fragmented ad hoc fashion by donor-driven initiatives. GEF resources will therefore be used to i) build upon the activities of the baseline projects as a foundation for establishing and implementing CBNRM plans within two pilot districts that are representative of two ecologically distinct areas – the Eastern Forest Complex and the Central Highlands, respectively; ii) appoint skilled and experienced technical services providers to lead the development of training tools and programmes for government extension officers in the pilot areas as well as at members of FMCs; and iii) represent a valuable means of empowering rural communities, including women, in Afghanistan. The GEF project will adopt a phased approach to engaging communities in the design and implementation of CBNRM plans. Communities which have already established Forest Management Committees (FMCs) will be prioritised during the initial stages of the project. This Component of the project will primarily add incremental benefits to the baseline situation by targeting barriers relating to designing, implementing and monitoring CBNRM at the level of communities and sub-national government. In addition, this Component will target barriers related to accessible and availability of data and information to inform the design and implementation of CBNRM plans. The collection of forest inventory data will increase the availability of information to quantify the potential benefits and impacts of improved management of natural resources, in particular forests and other woody vegetation types. The rationale for the proposed approach to Component 2 is detailed further in Section 2, and particularly in Appendices 8–10.

Component 3: Promoting the demonstration and deployment of sustainable biomass energy systems, with a CBNRM approach.

Without the GEF project there will remain a low level of awareness and adoption of efficient technologies for biomass energy. This is partly attributable to inconsistent monitoring and limited availability of data to assess the outcomes of previous initiatives. In the absence of technical capacity and political will to promote and demonstrate SBESs and alternative approaches to biomass fuel use, there will continue to be little entrepreneurial interest or awareness of SBES. In addition, without GEF resources, it is likely that rural households in the target sites will continue to depend on unsustainably managed forest resources to supply biomass energy for inefficient cooking and heating, continuing or exacerbating current levels of deforestation and land degradation. The reduction in available fuel has a high impact on women's lives and health. Consequently, there is an urgent need to develop improved alternatives to traditional biomass energy use. GEF resources will therefore be used to address the technical, social and market barriers that currently prevent the widespread adoption of SBESs in Afghanistan by building on the baseline investments in capacity for rural development, community-based governance and renewable energy access. The following SBESs include a mix of low-cost and intermediate-cost technologies, which have the potential to reduce GHG emissions from household biomass fuel use. Furthermore, they are identified as suitable technologies to be demonstrated in the two pilot districts of Dara-e-Noor (Nangerhar province) and Salang (Parwan province). The project will promote each of these SBESs in an approach based on demonstration of concept and iterative improvement of design based on technical research and user feedback.

- **Low-cost fuel-efficient cooking stoves (FECs)**, to be produced by local tinsmiths and sold to households in participating communities at a partially subsidised price. FECs mainly reduce the consumption of woodfuel relative to unimproved/traditional cooking methods through: i) improved insulation, thereby reducing loss of heat to atmosphere; and ii) improved fit of cooking pot with stovetop, thereby increasing efficiency of heat transfer to the cooking pot. It is anticipated that FECs will mainly contribute to reduced household fuel use during the warmer seasons of the year when household energy needs do not include significant requirements for heating the homestead. The design of FEC to be piloted will be based on the model of stove piloted under the

USAID ILGNRM project¹. Cost of the stoves is estimated to be ~USD 50, including both procurement of material and payment for the labour of artisanal tinsmiths. FECs will reduce the use of cooking fuel by at least ~25%. This style of stove has been adapted to allow for the cooking of traditional *naan* flatbreads, which contributed to the uptake of this stove design by communities in the aforementioned project.

- **Low-cost fuel-efficient *bukhari* stoves (FEBs)**, to be produced by local tinsmiths and sold to households in participating communities at a partially subsidised price. It is anticipated that FEBs will mainly contribute to reduced household fuel use during the winter periods, when households will favour the use of systems that contribute to household heating. The project will favour a design of *bukhari* that includes stovetop apertures to allow for cooking and warming of water to be undertaken at the same time. It is conservatively assumed that FEBs will reduce household fuel use by up to ~25% in consideration of the likelihood that: i) households which receive FEBs will still practice traditional methods such as *tandoor* for cooking certain dishes; and ii) FEBs will be less suitable for household use during summer when excessive heat in the household is uncomfortable². Total production costs of FEB are estimated at ~USD 50³.
- **Household-scale biogas digesters**, to be constructed *in situ* by community members with the support of trained local builders. Biogas digesters to be promoted by the project will be based on the design and approach advocated by the NGO BORDA, which has been developed specifically for the context of Afghan households. The estimated cost of materials for construction of the digesters (not including labour) is ~USD 600–800, which will be partially subsidised by the project as an incentive to promote adoption of the technology. Digesters will be promoted preferentially to wealthy and/or influential households in the area for the following reasons: i) initial investment costs are relatively expensive for most households; ii) households with sufficient livestock animals to supply the digesters should be identified and prioritised; iii) households with the necessary cooking attachments for LPG fuels should be identified and prioritised to ensure compatibility with existing cooking methods and equipment; and iv) promotion of new technologies by influential community leaders will increase the credibility of the biogas digester system in the eyes of sceptical community members. It is unlikely that biogas digesters will completely displace traditional methods of cooking. Furthermore, this type of SBES will not displace the significant household demands for heating during winter. It is assumed that a well-maintained biogas digester could reduce household use of biomass fuel for cooking and heating water by ~50%. Additional benefits of these systems is the improved indoor air quality and resultant health benefits of reduced smoke pollution. Furthermore, the systems produce a composted slurry of waste which can be used as an agricultural fertiliser.

Research outputs will be hosted on a publicly accessible forum under Component 1, thereby contributing to the availability of technical data on SBESs. Furthermore the research undertaken on SBESs will be used to inform the policy briefs generated in support of institutional strengthening activities under Component 1 as well as the public awareness-raising activities under Component 4.

Component 4: Awareness raising and monitoring and evaluation

Without the GEF project, there will remain a low national awareness of the potential of SFM, REDD+ and other activities for securing international funding for the conservation and sustainable management of current forests in Afghanistan. This mobilisation is further hampered by the current limited capacity to undertake a carbon monitoring programme. GEF resources will be therefore be

¹ USAID. 2013. Performance Evaluation: improving livelihoods and governance through natural resources management (ilgnrm) project, Afghanistan. Accessed on 31 October 2014. Available at: https://www.academia.edu/7808374/Performance_Evaluation_improving_livelihoods_and_governance_throu_gh_natural_resources_management_ilgnrm_project_Afghanistan

² Escorts Foundation (1999). Fuel Efficient Smokeless Stoves, Pakistan. http://postconflict.unep.ch/humanitarianaction/documents/03_03-04_02-05.pdf

³ Ashmore, J. 2002. Analysis of heating and cooking fuels and stoves in refugee, IDP and local settlements, Kabul, Herat, Afghanistan March 2002. Accessed on: 31 October 2014. Available at: http://www.shelterproject.org/downloads/peer1rep/stoves_06_02.pdf

used to gather best practices and lessons learned through the project interventions, and share these through appropriate media. The process of learning-by-doing will allow the project to increase the impact and success of activities throughout the project duration. The exchange of knowledge between other renewable energy projects nationally, regionally and internationally through appropriate networks will ensure that the project can make use of all available expertise, while also contributing to global knowledge on the implementation of SBESs. Linkages with on-going UNEP and FAO national and international networks will be developed to enhance the success of the project.

The global environmental benefits that will be delivered by the project will include *inter alia*:

- Avoided emissions from deforestation and degradation, and increased sequestration of carbon in plant biomass and soil, as a result of sustained implementation of CBNRM plans during and beyond the period of project. The project will facilitate the implementation of sustainable forestry and natural resource management activities across an area of at least 24,000 ha, resulting in reduced GHG emissions from the LULUCF sector of ~37,491 tonnes CO₂e per annum.
- The project will directly benefit a population of approximately ~60,000 people through training, awareness-raising and increased access to SBES. A minimum of 1,920 households, equivalent to ~14,000 people, will benefit from the provision of SBESs, thereby reducing the household burden of expensive fuel costs and reducing exposure to particulate air pollution and resultant ailments. The project will create direct work opportunities, and provide training, to at least 30 artisans who will be contracted to manufacture and sell the SBESs promoted by the project.
- Increased empowerment of women through active participation in the project's activities, including through the engagement of the District Development Authorities. The DDAs are represented by both male and female members (~30% female) and as a result the project will emphasise close engagement with DDAs as a mechanism to support the inclusion and representation of women in the project's activities.
- Conservation and restoration of threatened biodiverse ecosystems, including the Eastern Forest Complex and Central Highlands woodlands across an area of at least 24,000 ha.
- Increased generation of ecosystem goods and services from restored ecosystems, thereby contributing to household income through increased availability of valuable NTFPs and other commercially valuable products. The restoration of these degraded ecosystems will also contribute to reducing the vulnerability of local populations to the negative impacts of climate change and related hazards such as landslides and watershed degradation.

These benefits are described extensively in Section 2.5.

1.3 FAO's comparative advantages

FAO is the United Nations organisation mandated with working on forestry, conservation and wildlife and natural resource management. FAO's identified GEF comparative advantage is in this area, as a result of its experience in forestry, fisheries, agriculture and land management. The FAO Forestry Department is further mandated to support member countries to implement sustainable forest management by providing policy advice, technical knowledge and reliable information. It has extensive in-house expertise in terms of forestry, with global systems and experience in establishing, managing and training of individuals in the use of forestry-related information systems. FAO has particular expertise in climate change mitigation in agriculture and forestry through carbon sequestration, sustainable management of natural and planted forests, and capacity-building on climate change issues.

FAO has been operating in Afghanistan since 1977, interacting with national governments to enhance food, agricultural and wood production and management through direct interventions, policy support and capacity building of national structures and local communities. It operates in close proximity with MAIL, MEW and MRRD, and has well-established linkages with other national departments. In addition to the central office in Kabul, the FAO has regional offices in Herat, Jalalabad, Kandahar, Mazar-i-Sharif and Faizabad. The FAO Representation in the country includes 24 full time staff, with 112 further staff allocated to specific FAO projects. The Representation currently manages a large

portfolio of projects in Afghanistan, and will assist with the operational aspects of project implementation. Technical backstopping will be provided through the regional offices, with additional support from FAO staff in Rome

- FAO has institutional technical expertise and experience relevant to this project through several global projects as well as regular programme activities. Particular areas of expertise include:
- developing integrated sustainable rural biofuel programmes through the BioEnergy and Food Security (BEFS) programme piloted in Thailand, Tanzania and Peru;
- integrated energy farming through FAO-supported work by the Sustainable Renewable Energy Network (SREN);
- monitoring and reporting of forest stocks reflected in the frequent State of the Worlds Forest Reports (most latterly in 2011);
- integrated woodfuel supply and demand mapping for strategic planning through the Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) project; and
- measurement, reporting and verification of forest carbon sinks as one of the FAO's major contributions to the UN-REDD Programme.

FAO will also align with the ongoing activities of other agencies with related focuses such as UNEP and UNDP in order to implement the project in alignment with ongoing activities in Afghanistan. In particular, the project will include maintain close engagement with UNEP in order to benefit from the accumulated experience in the development of local sustainable biomass energy implementation through recently-completed projects in Afghanistan's Bamyan Province. In addition, UNEP's comparative advantage with respect to ecosystem management and community-based natural resource management will be useful to guide the design of community-based activities. UNEP's PCDB has a strong professional relationship with NEPA, is currently providing execution support to the national agency for several GEF projects at the request of the GoIRA, and will be invited to play a role in the Project Steering Committee of this GEF project. The UNEP and FAO country offices have experience in the co-implementation of cooperative projects through the SAISEM project in Afghanistan.

1.4 Participants and other stakeholders

Table 10. Project stakeholders and participants.

Stakeholder	Roles and responsibilities
United Nations Food and Agricultural Organisation (FAO)	The FAO is the GEF implementing agency for the project. It will provide technical support for the project as a whole through its global expertise and in-country infrastructure. This oversight role includes the identification and recruitment of suitable expertise to ensure that project activities can be suitably planned and executed. In addition, it will facilitate the monitoring and evaluation of the project outcomes, and will sit on steering and management committees to provide essential project support.

Stakeholder	Roles and responsibilities
Ministry of Agriculture, Irrigation and Livestock (MAIL)	<p>MAIL will be the lead executing partner for the GEF project. Charged with restoring Afghanistan's licit agricultural economy through increased production, efficient natural resource management and market development, MAIL has both a Natural Resource Management and a Forestry Department. MAIL also chairs the Agriculture and Rural Development cluster of the National Priority Programmes. As a result, MAIL will host the NPIU and participate in the Project Steering Committee (PSC) and the Sustainable Biomass Energy Working Group (SBEWG) established through the project.</p> <p>In the long term, MAIL is the agency best situated to lead the implementation of community-based forestry and natural resource management and is the public body mandated to assign forest use rights. Consequently, MAIL– as well as its provincial representation – will lead interventions under Component 2, and support MRRD's implementation of interventions under Component 3. MAIL will also contribute to policy revisions under Component 1, where relevant, particularly with respect to policies and plans relating to natural resources and forestry. The coordination of project activities in the pilot provinces will rely on the logistic support of provincial MAIL directorates and it is anticipated that Provincial Coordination Units will be hosted by DAIL offices. The active participation of MAIL extension staff in the engagement of Forest Management Committees will be critical to the design and implementation of CBNRM plans.</p>
National Environmental Protection Agency (NEPA)	<p>NEPA is Afghanistan's national GEF focal point. Formed in 2005, NEPA's function and roles are outlined in Afghanistan's first environmental law, which was passed in the same year. Its portfolio includes regulatory, coordination, monitoring and enforcement roles for all environmental issues in Afghanistan. It currently chairs the inter-ministerial Committee for Environmental Coordination and the National Climate Change Committees, which are responsible for the coordination of inter-ministry responses to cross-cutting and multi-sectoral issues.</p> <p>NEPA has been identified as an Executing partner for this and other projects under multilateral environmental agreements (MEAs), and will therefore coordinate both the local and international stakeholders for the GEF project implementation as well as with other aligned initiatives. Consequently, NEPA will chair the PSC as well as contribute to the National Project Implementation Unit (NPIU) and SBEWG. NEPA provincial staff will participate in the selection of priority communities and activities to be implemented by the project under Components 2 & 3, particularly those activities related to NRM. NEPA will ensure that project activities are undertaken in alignment with national environmental law and good practices. NEPA's role as a coordinator of this project should also include contributions to the proposed revisions of sectoral policies and strategies, where relevant, to ensure that propositions are aligned with environmental law and best practices. Under Component 4, NEPA will play an important role in the public education and awareness-raising activities of the project, including through NEPA's ongoing activities to increase public awareness of issues related to environment and climate change.</p>

Stakeholder	Roles and responsibilities
Ministry of Rural Reconstruction and Development (MRRD)	<p>The MRRD is the government agency mandated with improving rural infrastructure, enhancing local planning and management capacity, and promoting rural livelihoods. It is currently undertaking the majority of the government's off-grid and local power generation activities, largely through the large-scale National Area-Based Development Programme (NABDP) and to a lesser extent through the National Solidarity Programme (NSP). The Energy for Rural Development Afghanistan (ERDA) programme initiated under the NABDP has the specific objectives of government and community capacity development, policy review and piloting demonstration projects on rural & renewable energy. However, rural energy projects such as the ERDA have focused primarily on micro-hydro power (MHP), small scale photovoltaic and solar water heating projects, without a significant integration of SBES alternatives.</p> <p>Through the NSP and the NABDP, MRRD's activities have established and capacitated sub-national community groups – notably Community Development Committees (CDCs) and District Development Authorities (DDAs) throughout Afghanistan – which are the ideal structures through which the GEF Project will interact with communities. The establishment of such structures to support local governance will provide a foundation for promotion and implementation of the project's activities related to CBNRM and integrated energy plans within the pilot areas. Furthermore, the GEF Project will interact with the MRRD to build capacity for CBNRM, SBES and REDD+/CDM activities to improve Afghanistan's ability to promote low-carbon sustainable development.</p> <p>Consequently, the project will benefit from the participation of MRRD in the NPIU, PSC and SBEWG. Through its provincial representation, the MRRD will lead interventions related to dissemination of SBESs under Component 3, as well as supporting MAIL's implementation of interventions under Component 2. MRRD will also contribute to policy revisions under Component 1, where relevant. Technical information and data generated by previous and ongoing MRRD projects, particularly those related to renewable/biomass energy, should be shared with project participants for inclusion in the project's knowledge management activities (Components 1 and 4). MRRD will assist with the identification of appropriate biomass energy technologies and technical research priorities to be addressed by project. MRRD will benefit from financial and technical assistance, including technical capacity building of MRRD staff, to promote and implement biomass energy technologies.</p>
Ministry of Energy and Water (MEW)	<p>MEW is the national department mandated with managing Afghanistan's energy needs, is a key member of the ICE and RECC committees on energy development. Within MEW, the Renewable Energy Department (RED) is the department mandated with the development of electricity generation using renewable energy technologies. The principle focus of RED's activities has been on hydro-electricity generation and solar power. Within RED, the Biomass Energy Department (BED) has been established to develop the potential of biomass energy to contribute to national renewable energy mix, however, many of the priority activities of BED could not be completed in 2014 as a result of funding shortfalls. Consequently, the BED and RED within MEW are essential partners for the project to facilitate mainstreaming of efficient biomass energy systems.</p> <p>It is anticipated that MEW will contribute to development of policies and strategies to strengthen the institutional environment to promote sustainable biomass energy within Component 1. Furthermore MEW will assist with the identification of appropriate biomass energy technologies and technical research priorities to be addressed by project. In addition, relevant technical information and data generated by MEW initiatives should be shared with project partners. MEW will benefit from financial and technical assistance, including technical capacity building of MEW staff, to promote and implement biomass energy technologies. Consequently, MEW will offer valuable contributions to the NPIU, PSC and SBEWG.</p>

Stakeholder	Roles and responsibilities
UN Environment Programme (UNEP)	<p>UNEP has been consulted during the initial stages of the project design, and is an essential partner for providing technical assistance. UNEP PCDMB has provided considerable technical support to NEPA in the management of MEA obligations and implementation of GEF and other projects in Afghanistan. UNEP's local office is currently providing executing support to NEPA for two other GEF projects through direct assistance and extensive capacity building activities, and will likely play a similar role in the project. UNEP has over 10 years of operational experience in Afghanistan. This proposed GEF project's focus on enhancing national capacities related to climate change mitigation is complementary to UNEP's ongoing activities related to climate change adaptation under UNEP LDCF 1 project.</p> <p>Consequently, UNEP's technical expertise and experience in Afghanistan may be valuable sources of guidance and coordination to the GEF project and consequently UNEP will be invited to contribute to the PSC and SBEWG. Furthermore, UNEP will launch Afghanistan's Climate Change and Technology Network (CCTN) website in 2015 which may be an appropriate platform for hosting the project's proposed biomass energy information hub.</p>
Bremen Overseas Research and Development Association (BORDA)	<p>BORDA is an international organisation concerned with poverty alleviation, sustainable protection of natural resources, and the strengthening of social structures. As part of its mandate to provide access to electricity in remote rural villages, BORDA has implemented a number of biogas initiatives in Bamyan Province. Furthermore, BORDA was instrumental in the establishment of Afghanistan's Biogas Consortium in October 2014. The Biogas Consortium is a partnership between organisations that wish to promote, contribute to, and learn about the sustainable development of biogas in Afghanistan.</p> <p>BORDA will play a technical service provision role in the proposed GEF project and will provide technical support and guidance for renewable energy interventions. The design of <i>in situ</i> locally-constructed biogas digesters designed by BORDA will be promoted at the project implementation sites, integrated with community awareness-raising and training activities. Consequently, BORDA will play a valuable role by bringing technical expertise and experience in community training and engagement. BORDA will be invited to join the Sustainable Biomass Energy Working Group (SBEWG) and the Project Steering Committee.</p>
Mission d'Aide au Développement des Economies Rurales en Afghanistan (MADERA)	<p>MADERA is an international organisation that has been promoting rural development in Afghanistan since 1988. MADERA – through the NSP – has supported 1267 CDCs implement community projects throughout Afghanistan and support for a further 435 CDCs is planned for 2015¹. As part of its 2014–2017 strategic plan, MADERA aims to collaborate with complimentary forestry and CBNRM projects to reintroduce its agroforestry initiatives and continue with CBNRM interventions that have been in abeyance since 2013.</p> <p>Consequently, MADERA will play a role of technical service provider to the project as a field-implementing partner, mainly by providing technical support and guidance for CBNRM and forestry interventions through imbedded technical staff in the pilot areas. Furthermore, MADERA will be invited to join the SBEWG and PSC.</p>
Kabul University	<p>Kabul University, in particular the Kabul University Renewable Energy Lab (KURE Lab) within the Faculty of Engineering, will be leading the technical analyses and studies of SBES technologies to support monitoring and evaluation of emission reductions, as well as producing published academic studies. These measures will support detailed carbon monitoring in future projects and will establish capacity and reference data for national GHG monitoring. Kabul University and KURE will also be invited to join the SBEWG.</p>

¹ MADERA Strategic Plan 2014–2017. Available at: <http://www.madera-asso.org/english/strategic-plan/strategic-plan-2014-2017-1/>. Accessed on : 09 December 2014.

Stakeholder	Roles and responsibilities
Participating local communities, particularly through representatives of District Development Assemblies (DDAs); Community Development Councils (CDCs); and Forest Management Committees (FMCs)	Representatives of district-level government and CDCs were engaged in the project during the PPG phase to identify potential project implementation sites and obtain baseline data. DDAs will be consulted during the initial phases of project implementation to identify suitable communities that are represented by suitable CDCs and FMCs for project interventions. Community leadership and ongoing consultation will be a consistent theme throughout project implementation. The planning, design and management of project activities under Components 2 and 3 will include direct participation of local communities to that activities are appropriate and respond to urgent community needs.
Private sector	The GEF Project will include private sector enterprises by promoting and training identified local businesses and communities in the establishment of suitable SBES solutions. The cultivation of private sector enterprises will facilitate the upscaling and rolling out of successful SBES activities to the broader community subsequent to project completion.

1.5 Lessons learned from past and related work, including evaluations

Numerous previous and ongoing initiatives have provided recommendations and lessons learned that have been incorporated into the activities and approach of the GEF project (a detailed summary of past initiatives related to biomass energy are provided in Appendix 7). Furthermore, these initiatives have contributed to building capacity experience and have generated protocols that can be applied in the field activities of the GEF project. Throughout the implementation period, the project will benefit from regular engagement with other stakeholders and ongoing initiatives in order to coordinate activities, share information and explore opportunities for collaboration. The inclusion of representatives of three line ministries as well as NEPA will further support an atmosphere of collaboration and information-sharing between representatives of the sectors of energy, rural development, climate change, and management of forests and natural resources.

In the field of off-grid renewable energy, and particularly biomass-based energy systems, several recent projects have been implemented in Afghanistan which have provided critical insights that have informed the development of the GEF project activities. In addition, multiple projects have focused on engaging rural communities in natural resource management, protected area management and environmental education. Some examples of these projects and the lessons learned are detailed below.

The FAO-led project “**Initiating participatory forestry in support of sustainable livelihoods in Afghanistan**” (IPF) implemented community forestry programmes in the provinces of Balkh, Baglan and Nangerhar¹. The primary mission of the IPF project was to improve the status of forest by demonstrating effective management mechanisms in a way that these resources could become a viable income source for the people. The project also intended to bring communities, government forestry departments and research institutions in a unique partnership to ensure sustainability of established participatory forestry practices. The project highlighted several challenges and benefits of CBNRM in rural Afghanistan, identified suitable participatory forest management methodologies for upscaling nationally, and provided FAO with additional experience in strategies for ensuring the success of community-based management approaches. The review of the IPF notes that the short implementation period of development projects is insufficient to evaluate and sustain the impacts of investments in

¹ FAO (2012). Project Findings and Recommendations. Initiating Participatory Forestry in Support to Sustainable Livelihoods in Afghanistan.

sectors such as forestry. However, the project provided extensive training to national, provincial and district-level government representatives as well as to members of participating communities, which provides a baseline of technical capacity to continue the replication and upscaling of community-based forestry and NRM. The IPF also provided the seed funding to develop the initial PIF concept for this proposed GEF project, consequently the lessons learned and capacity built by the IPF project are directly relevant to the proposed GEF project. Therefore the proposed GEF project will rely strongly on the successful practices and approaches piloted by the IPF project and will aim to replicate and upscale the investments of the latter. Several recommendations that will be included in the design of the GEF Project include:

- Technical recommendations – Development and support of alternative livelihoods is critical to sustaining investments in forest protection and restoration to supplement the loss of household income. A successful approach applied by the IPF was promoting and providing training for women to establish nurseries for forestry and fruit trees. Promotion of agroforestry and prioritisation of commercially valuable plant species was also an effective means of supporting community livelihoods.
- Policy recommendations – The IPF review noted that sustainable development of natural resources was not prioritised in the context of the multiple pressing socio-economic needs in Afghanistan. Further support is required to ensure that existing policies for sustainable natural resource management are actively implemented and updated where necessary.
- Project management – The IPF applied different implementation modalities in the various pilot provinces owing to limited availability of field staff and supporting logistics. The operational and management costs of coordinating project activities in the pilot provinces is considerable and consequently it was recommended to identify cost-effective arrangements for management and implementation according to availability of local capacity.
- Inter-agency cooperation – The IPF noted the importance of including national and sub-national government staff in the design and implementation of the project to ensure sustained management and oversight of the project's investments. The importance of coordination between ongoing initiatives was also emphasised.

The FAO-led “**Strengthened Approach for the Integration of Sustainable Environmental Management in Afghanistan**” (SAISEM) project was implemented jointly by FAO-UNDP-UNEP and had the primary aim of strengthening of the various natural resource management strategies of MAIL, NEPA and the MRRD. This initiative will support the proposed GEF project through the investments in capacity building and the institutional knowledge built within government technical staff. One of the key outputs of the SAISEM project was a summary overview of ‘Best Practices and Lessons Learned’ on CBNRM in Afghanistan. Several key lessons learned outlined by the SAISEM review are summarised below and are provided in more extensive detail in the review document¹.

- The active participation of communities in mapping the project area was an important tool for fostering ‘buy-in’ as well as for including traditional knowledge and practices in the project’s activities. Furthermore, the process of developing a visual planning tool supports the inclusion of all community members where limited literacy would be a barrier to inclusive planning.
- Government visibility at all stages of the project was an important determinant of community trust and acceptance of the project’s activities and the presence of government.
- A sense of security of tenure and self-determination should be fostered so that communities feel empowered to implement and invest in forest management. Simultaneously, communities who are granted stewardship rights must also provide government with assurance that the area in question will be used and managed with appropriate environment safeguards
- Participatory Rural Appraisal (PRA) approach is a useful tool for engaging communities in planning and implementing appropriate management practices.

¹ SAISEM (2011). Best Practices and Lessons Learned in Community-Based Natural Resource Management in Afghanistan. MDGF1713-E-11a-AFG: Strengthened Approach for the Integration of Sustainable Environmental Management in Afghanistan – A FAO-UNDP-UNEP Joint Programme

- Information and knowledge on the original state of natural resources is scarce but is useful in establishing goals and indicators for management of a given area. Community elders are a valuable source of information.
- Traditional knowledge and practices are familiar and acceptable to participating communities, and these practices can be improved or developed further through application of contemporary science and emerging practices.
- A summary field manual on CBNRM for government officers is needed.

The USAID-funded project entitled “**Improving Livelihoods and Governance through Natural Resource Management**” (ILGNRM) was implemented by the Wildlife Conservation Society (WCS) in Bamyan and Badakhshan provinces. This project included a significant focus on promoting fuel-efficient cooking stoves (FECs) and provided important data and several key implementation lessons that have been included in the design of the proposed GEF project¹.

In terms of the approach to programme design, some lessons of the ILGNRM which are reflected in the proposed project design include: i) validate the preferred design of stove (SBES) in participation with end-user households; ii) pilot the preferred SBES prior to widespread distribution; iii) engage community associations to promote and sell SBES; and iv) subsidise SBES prices to drive adoption. In terms of technical aspects of the SBES design, the ILGNRM highlighted the potential design improvements that could be generated through feedback from users after an initial pilot phase. Furthermore, the ILGNRM highlighted the importance of promoting SBESs which are compatible with local cooking habits and other household energy needs e.g. systems which can be used to heat the home and boil water are preferable to systems which are intended only for cooking. Households which benefited from FECs continued to use traditional *tandoors* and *bukharis* as needed for cooking and space heating in the winter months, to bake *naan* (flat bread) and/or when there are a large number of people to cook for. However, all users interviewed reported that they now use less fuel for cooking with the project stove, where most estimated at least 25% less fuel used.

Finally, the challenges experienced by this initiative underlined the need to understand and respond to the local social context as well as the technical requirements for SBES. For example, low numeracy and literacy among users challenged efforts to quantify household fuel use. Furthermore, monitoring and evaluation of SBES performance requires at least a year, considering that daily stove use is not homogenous and differs according to environmental, social and climatic differences.

The USAID-funded **Afghan Clean Energy Project (ACEP)**² focused on developing capacity for off-grid and local electric power options with a particular emphasis on renewable energy. This project resulted in considerable technical and institutional capacity within energy ministries and also contributed to the establishment of the Kabul University Renewable Energy (KURE) Lab, thereby supporting a transfer of knowledge and institutional memory between initiatives³. Several challenges highlighted by the ACEP project relate to the operational difficulties of implementation in Afghanistan’s context, noting that logistic and security challenges undermine the effective implementation of project activities. Several key recommendations included: i) understand the needs of men and women in relation to their roles and promote technologies and services that satisfy these needs and are locally appropriate; ii) be aware that energy institutions tend to be male-dominated which results in issues identified and solutions offered having male bias; iii) engaging with women’s

¹ USAID. 2013. Performance Evaluation: improving livelihoods and governance through natural resources management (ilgnrm) project, Afghanistan. Accessed on 31 October 2014. Available at: https://www.academia.edu/7808374/Performance_Evaluation_IMPROVING_LIVELIHOODS_AND_GOVERNANCE_THROUGH_NATURAL_RESOURCES_MANAGEMENT_ILGNRM_PROJECT_Afghanistan

² Cota, A. 2011. ACEP Winrock final report 2011. Accessed on: 31 October 2014. Available at: <http://www.usaid.gov/sites/default/files/documents/1871/Fact%20Sheet%20ACEP%20Afgan%20Clean%20Energy%20Project%20FINAL%20June%202011.pdf>

³ Ibid

associations is necessary to legitimise interventions which are likely to be implemented by women in practice.

The **Shelter** project¹ undertook a study to assess the technical performance and suitability of a range of household heating and cooking systems used in Internally Displaced Persons (IDP) settlements. The study undertaken by this initiative is one of the more comprehensive assessments of styles and designs of biomass-based stoves in Afghanistan and generated basic data on cost, performance and fuel consumption of the various stoves employed by IDPs. The primary lesson reported by the Shelter project's report was that small, multi-purpose stoves tend to be better suited to use in Afghan IDP temporary settlements. In practical terms, it was noted that the preferred method for manufacturing stoves should consider whether or not to use an approach that requires welding, as this significantly increases production cost and makes repair costly and difficult for IDPs or communities without access to such tools. Locally procurable stoves tend to be made of very thin metal. This has the advantage that they are cheap and relatively easy to repair locally. As it is relatively expensive to braze or weld metal, and it is not possible to do so outside of the larger cities, locally fabricated stoves are generally made by hammering and crimping the metal whereas stoves that are built to a higher specification with thicker steel can only be made and repaired with welding/brazing equipment. Therefore, if the preferred approach is to catalyse small commercial enterprises related to the technology or stove type under demonstration, it is advisable to promote technologies that can be constructed and maintained locally.

Currently there are two ongoing UNEP GEF projects which are being coordinated by NEPA which will continue to provide lessons and guidance to support the implementation of this FAO GEF project. Through the central GEF focal point, interaction between these projects will be ensured, and wherever possible synergies in terms of training and project management will be developed. In particular, the GEF Trust Fund project **“Developing core capacity for decentralised MEA implementation and natural resources management in Afghanistan”** 2012 – 2015 (US\$ 910,000) and the LDCF project **“Building adaptive capacity and resilience to climate change in Afghanistan”** 2012 – 2016 (US\$ 5,390,000). Both projects have a focus on developing national capacity and coordination, particularly in the sectors related to climate change and natural resource management. The latter project on climate change adaptation overlaps with this GEF FAO project in the focus on establishment of restored and productive ecosystems implemented by community-based structures. The two projects will therefore regularly meet to exchange lessons learned, project successes and challenges, and to integrate these into on-going activities to enhance project success. The NEPA National Climate Change Committee will be invited to sit on the project steering committees for both these projects to support improved oversight and ensure a common understanding of the project between participating ministries.

Throughout the project implementation period, participants should proactively identify other ongoing projects with related activities, particularly those which generate data and knowledge outputs relevant to biomass energy, NRM and other relevant topics. The identification of projects which generate best-practice guidelines, field manuals and other knowledge outputs may be a source of material to be included in the online information system. The project will benefit from close engagement with other stakeholders and can also thereby support improved coordination between ongoing initiatives.

1.6 Links to national development goals, strategies, plans, policy and legislation, GEF/LDCF/SCCF and FAO's Strategic Objectives

a) Alignment with national development goals and policies

¹ Ashmore, J. 2002. Analysis of heating and cooking fuels and stoves in refugee, IDP and local settlements, Kabul, Herat, Afghanistan March 2002. Accessed on: 31 October 2014. Available at: http://www.shelterproject.org/downloads/peer1rep/stoves_06_02.pdf

The GEF Project is fully consistent with the relevant national development programmes and sector plans adopted by the GoIRA, as well as with various programmes and action plans promulgated by the GoIRA under its commitments to relevant international environmental conventions.

The GEF Project conforms with the following national programmes and sector plans:

The **Afghanistan National Development Strategy** (ANDS, 2008 – 2013), which is the central strategic document that identifies national development priorities in the country. Climate change mitigation is not addressed in this document, but its relevance to national development has been articulated subsequently through various national strategies, outlined below. The ANDS prioritises rural economic growth through planned investment in infrastructure and inputs for legal farming production and sustainable use of natural resources. The plan will: i) increase the amount of available arable land and ensure that the land is distributed to the poor and landless; ii) register rural land titles; iii) protect the rights of small producers; and iv) increase women's participation in decision-making processes. The GEF Project addresses priorities and outcomes identified within the ANDS, including: i) the energy sector ("An enabling environment for private sector investment in energy sector created" and "Increased access to rural energy services"); ii) the agriculture and rural development sector ("Improved agriculture and rural infrastructure"); and iii) the social protection sector ("Poverty and vulnerability reduction, improved employment"), as well as cross-cutting environmental activities within other pillars, such as the Refugee, Returnee & Internally Displaced Peoples sector (management of natural resource to avoid conflict).

The **National Priority Programmes (NPPs)**, which are currently being implemented as part of the national coordination process. These programmes build on the ANDS by providing a sector-specific focus and the GEF Project will coordinate with the NPPs to address relevant national priorities. The GEF Project is particularly aligned with the NPP cluster on Agriculture and Rural Development (ARD), predominantly implemented by MAIL. The ARD cluster focuses on building prosperous rural and pastoral communities' through the complimentary interventions of its four NPPs. The NPP most relevant to the GEF Project within this cluster is the **National Water and Natural Resources Development Programme** (ARD NPP-1), specifically Component 2, Sub-Component 2: **Energy for Rural Development in Afghanistan** (ERDA). The GEF Project will climate-proof ARD NPP-1 by incorporating climate change mitigation interventions into the programme's operational plan.

The GEF Project is also aligned with **National Strengthening of Local Institutions Programme** (ARD NPP-4), which aims to improve the performance of effective institutions for local governance and socio-economic development and promotes the decentralisation of responsibility to local governance structures. In addition, the project supports The **National Energy Supply Programme** (ID NPP-4) under the Infrastructure Development cluster (ID), which highlights the potential for decentralised renewable energy options to meet the needs of poverty-stricken households, in its pro-poor strategy. The strategy will allow communities to identify their own needs and create the conditions necessary to make efficient use of local energy sources as well as developing indigenous manufacturing, regulatory and technical capacities.

Afghanistan's **Forest Law**, which came into effect in September 2011. The law provides for the management, conservation and sustainable use of forests and forest resources in Afghanistan. The Forest Law focuses on: i) forest management arrangements and responsibilities; and ii) granting rights to communities that allow for decentralised management of forest resources. In order to apply for these rights, communities need to form a FMC and register with the relevant Provincial Council (See Figure 1). The Law details specific guidelines for forest and forest resource management – focusing on CBNRM – in Articles 5, 6 & 22. Other relevant guidelines in the Law cover: conservation (Articles 7, 12 & 17), resource use (Articles 13, 15 & 20) and rehabilitation (Article 21), in protected (Article 11) and unprotected (Article 10) areas.

Afghanistan's **National Forest Management Plan (NFMP)**, which was drafted by MAIL and approved in 2012. The NFMP fits under the Biodiversity and Land Management sub-component of the

Environmental Conservation and Management Component of NPP-1. Objective 2 of the NFMP lays the framework for managing Afghanistan's forests and implementing a nationwide CBNRM approach, based on enhanced socially acceptable management structures, the decentralisation of government authority and integrated resource management. The NFMP facilitates and supports this process through the establishment of a structure for strengthened governance mechanisms and the identification of critical information requirements. The NFMP identifies the relevance of REDD+ activities to the long-term management of forests. No roadmap has been prepared for this, however, and the GEF Project will assist in addressing this shortcoming.

Both the Forest Law and NFMP provide the framework for developing CBNRM and sustainable biomass energy systems. Consequently, the GEF Project's design and implementation will be informed by these national documents.

Afghanistan's **National Plan for Sustainable Rangeland Management** (NPSRM), which was developed in 2011 by MAIL. The NPSRM is a five-year plan that will provide a framework and roadmap to better facilitate a comprehensive integrated approach to rangeland management. The national plan will lay the foundation for the development and execution of a National Programme on Sustainable Rangeland Management through evidenced-based policymaking and cross-institutional partnerships. One of the main focuses of the NPSRM is to strengthen CBNRM in Afghanistan by linking community user rights to management responsibilities and providing incentives for communities to manage rangelands responsibly, through management plans¹.

The **National Biodiversity Strategy and Action Plan for Afghanistan** (NBSAP) for 2014-2017, is currently under development by NEPA. The NBSAP aims to reduce biodiversity degradation and protect ecosystem goods and services in the country through expanding protected areas, promoting biodiversity awareness and monitoring flora and fauna. This includes assessments and overviews of available information on Afghanistan's biodiversity and its current status. The GEF Project's forestry interventions will be aligned with the goals and vision of the NBSAP.

Afghanistan's **Energy Policy** (2009) describes energy development laws and regulations. The policy focuses on developing national power-generating capacity, including the role of renewable energy. A draft **Renewable Energy Policy** (ANREP) was prepared under the GIZ ESRA programme and presented to the Inter-Ministerial Commission on Energy (ICE) in September 2014. The policy describes Afghanistan's proposed approach to incorporating renewable energy into national strategies and acknowledges the potential contribution of renewable energy to addressing the cross-sectoral challenges of climate change and supporting Afghanistan to adopt a low-carbon growth model and strategy for climate change mitigation (for example, within a portfolio of Nationally Appropriate Mitigation Actions, or NAMA). The ANREP identifies SBESs as a high priority area for development by future initiatives, noting that the promotion of sustainable biomass use will support the achievement of other ANREP targets related to increasing access to energy. It is noted within the ANREP that renewable energy projects should explore available options for receiving climate funds to increase the viability of project activities and develop a market to promote suitable technologies. The draft policy calls for the formation of the Renewable Energy Development Authority, which has not yet been done. The GEF Project will facilitate the ratification and mainstreaming of the draft ANREP, as well as defining the role of sustainable biomass energy systems in diversifying rural energy options. Furthermore, the ANREP notes the need to develop a Renewable Energy Strategy and Action Plan, which the GEF Project can support by providing recommendations and policy briefs to motivate for the meaningful inclusion of biomass-based energy within the Strategy and Action Plan documents that will be used to drive implementation of the ANREP.

The GEF project is also aligned with Afghanistan's **Rural Renewable Energy Policy** (RREP, 2013) and the implementation of the associated **Rural Renewable Energy Action Plan 2020** (RREAP,

¹ These management plans are currently being piloted in 33 sites around Afghanistan by UNEP.

2014). In particular. The RREAP aims to support at least 2,000,000 households to increase access to improved energy systems as an alternative to traditional biomass energy use.

Afghanistan's **National Action Plan for Women**, which describes the GoIRA's plan to integrate women into national governance and coordination. The plan also highlights the current challenges to women's education and empowerment in Afghanistan. The GEF Project will be guided by the plan and gender-disaggregated indicators will track the success of facilitating women's empowerment through project activities. The expected benefits of the GEF Project activities for rural in women are highlighted in Sections 3 and 5.

b) Alignment with NAPA, NAPs, NBSAP, NIPs, NAMA

At present, Afghanistan does not have a national strategy on climate change or mitigation. Furthermore, there has been no detailed national mitigation assessment of the various options available¹. The GEF Project is aligned with the **National Adaptation Plan of Action (NAPA)** and **National Capacity Needs Self-Assessment (NCSA)**, which were produced in 2009. Afghanistan's NAPA and NCSA were developed as a combined document, because of the cross-cutting nature of commitments and requirements under the multilateral environmental agreements (MEAs). Challenges identified by the NCSA include the limited capacity of national institutions to carry out obligations under MEAs. This capacity gap includes the skills necessary to undertake integrated national planning for policies and strategies that address the abovementioned obligations. International partners (including GEF) have been assisting in bridging this gap in recent years with some success, and the GEF Project will continue this process.

Afghanistan submitted its **Initial National Communication (INC)** to the UNFCCC in June 2012. The INC provides a rough inventory of GHG emissions, and highlights some of the capacity gaps in national structures for undertaking a comprehensive reduction strategy. Whilst the INC does not specifically provide programmes and objectives for reducing emissions, it does detail those sectors primarily responsible for Afghanistan's GHG emissions. The GEF Project is aligned with the INC and will assist in addressing identified capacity gaps, as well as focusing on the principal sectors responsible for national GHG emissions.

c) Alignment with GEF CCM focal areas and/or LDCF/SCCF strategies

The GEF Project is aligned with the climate change mitigation focal area of the GEF Trust Fund. Through the implementation of the GEF Project activities, practices that contribute to a reduction in the impacts of deforestation, land degradation and reduced soil fertility resulting from fuel gathering will be encouraged, while at the same time reducing Afghanistan's contribution to global levels of GHGs. In particular, the project will primarily contribute to GEF focal areas of CCM-1, CCM-3 and CCM-5.

Component 1 will address CCM-1 (promote the demonstration, deployment, and transfer of innovative low carbon technologies) by testing and deploying innovative and sustainable biomass energy technologies in three pilot areas, by improving national knowledge management and capacities to deploy sustainable biomass energy technologies, and by promoting the integration of SBES and CBNRM into national-level policies and decision-making.

Component 2 is particularly aligned with CCM-5 (promote conservation and enhancement of carbon stocks through sustainable management of land use, land use change, and forestry) by promoting the reduced emission of GHGs emissions through the adoption of good management practices in community forests, woodlands and rangelands in the pilot districts. Furthermore, the data and information generated through this component will provide a foundation for evidence-based approaches to management of forests and natural resources that can be adopted and replicated by future initiatives.

¹ GoIRA, 2012. Initial National Communication to the United Nations Framework Convention on Climate Change

Component 3 is particularly aligned with CCM-3 (promote investment in renewable energy technologies) by creating a favorable local policy environment for renewable energy investments, incorporating CNBRM and community forestry approaches in targeted areas, to promote sustainable biomass developments. The promotion of three SBESs will be supported by rigorous scientific research of the technical performance and efficiency of technologies demonstrated, thereby supporting future investments in these technologies and providing a reference for quantifying GHG emissions reduced through promotion of SBES.

d) *Alignment with FAO Strategic Framework and Objectives*

The project is aligned with the FAO Forestry Department's regular programme activities to support sustainable forest management. In addition, the project is consistent with the Country Programming Framework (CPF) 2012 – 2015. Specifically, it addresses CPF Priority Area 3 ("support to the formulation and implementation of effective agricultural policies and institutional capacity building") and CPF Priority Area 4 ("support to better Natural Resource Management"), which both outline outcomes related to climate change mitigation and adaptation, as well as community-based forest management. Project activities for enhancing national capacity correspond to UNDAF Priority Area No. 1 ("good governance, peace and stability"), while the project as a whole specifically addresses UNDAF Outcome 5 ("improved capacity to manage natural resources to support poverty reduction and dispute resolutions, and to reduce vulnerability to natural disasters") in UNDAF Priority Area No. 2 ("sustainable livelihoods: agriculture, food, security and income opportunities").

SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS

2.1 PROJECT STRATEGY

The GEF project will seek to remove existing barriers to climate change mitigation in Afghanistan by promoting improved practices and policies. In particular, the project will focus on promoting climate change mitigation through activities related to: i) sustainable, participatory approaches to community-based forestry and natural resource management (CBNRM), in alignment with the Forest Law and the Forest Management Plan; and ii) sustainable and efficient use of biomass energy, including through the use of sustainable biomass energy systems (SBES) such as fuel-efficient cookstoves (FECs), *bukhari* heaters (FEBs) and biogas digesters, in alignment with recent national renewable energy policy. The project strategy is focused on building on and furthering the existing capacity and experience established by baseline investments, particularly with respect to the capacity of national and sub-national government and community-based organisations. These stakeholders will benefit from training, awareness-raising and technical assistance to design, implement and monitor locally appropriate activities that will reduce net GHG emissions while generating additional environmental and socio-economic benefits, particularly with a focus on renewable biomass energy and sustainable forestry/NRM. A fundamental element of the project strategy is to establish a foundation for future climate change mitigation activities by: i) generating user-specific training tools for government extension officers and community members, respectively; ii) generating and disseminating high-quality data and information to support calculations of GHG emissions from mitigation activities, particularly with respect to the sectors of LULUCF and renewable energy; and iii) integrating the project activities within the ongoing work of government under the National Priority Programmes, particularly within the mandates of MAIL, MRRD, MEW and NEPA.

The project's field-based activities will be undertaken in a phased approach that will initially focus on small-scale demonstrations and technical research of SBESs and CBNRM in the first year of implementation, and then subsequently upscale and replicate successful activities and technologies in participation with willing communities. The project's activities will prioritise the engagement of those communities which have already established representative committees for community development (CDCs) and forest management (FMCs) to provide these communities with urgently-required technical support to implement their respective plans for community development and forest management. Simultaneously, the project will also assist other less organised communities to establish appropriate community-based structures so that these latter communities can also be included in the project's activities during the second and third years of implementation. The process of establishing community-based structures will be supported by the participation of NGO Facilitation Partners that are experienced in assisting Afghan communities to participate in local governance. This phased approach will allow the project to prioritise practices, activities or technologies according to the specific preferences of individual communities, thereby supporting sustained local ownership of the project's investments. In addition, this flexible and phased approach will allow the project to prioritise approaches that maximise the generation of environmental, social and economic benefits as a further measure to support sustainability. Consequently, the project will result in sustained benefits, including reduced GHG emissions, for a prolonged period after project implementation.

The project's approach to implementation will strongly emphasise the involvement of knowledgeable and experienced NGOs and extension officers to benefit from the existing capacity and local knowledge established by previous and ongoing initiatives – for example, the FAO-led “Initiating Participatory Forestry in Support to Sustainable Livelihood in Afghanistan” project and the ongoing baseline activities of NGOs such as MADERA and BORDA. Whenever possible, the project's strategy will prioritise the appointment of NGOs with a well-established local presence as technical service providers to reduce the costs and logistic implications of procuring international consultants and support improved coordination and alignment with other stakeholders and ongoing initiatives. The need for effective coordination between ongoing initiatives was highlighted during the project development phase and as a result the project will use all available opportunities to collaborate and share information with relative initiatives and stakeholders. The proposed working group on sustainable biomass energy will be open to interested parties, including representatives of government,

NGOs, communities and other bilateral agencies, and will have a specific objective of coordinating rather than duplicating the efforts of related initiatives.

The project's outputs which contribute to generation of improved information and demonstration of successful practices will inform recommendations for strengthening the institutional and policy environment to support climate change mitigation, particularly within the sectors of NRM, renewable energy and rural development. In addition, the project will maintain close coordination with other aligned initiatives to promote sharing of experiences and best-practices. Consequently, the project's strategic approach aims to identify and mainstream appropriate mitigation practices – with a particular emphasis on NRM and household energy use – with complementary investments in awareness-raising, capacity-building and institutional strengthening.

2.2 PROJECT OBJECTIVES

In line with GEF guidance on climate change mitigation, the project's objective is to reduce GHG emissions by promoting community-based management of forests and natural resources, while removing barriers to sustainable biomass energy and laying the groundwork for further GHG emission reduction from Afghanistan. This objective will be delivered through four complementary components focusing on: i) strengthening existing policies, strategies and institutional frameworks to mainstream CBNRM and SBES technology into forestry and renewable energy development plans; ii) initiating sustainable community-based management of forests and natural resources through Forest Management Committees (FMCs); iii) demonstrating and promoting the adoption of practices for efficient use of biomass energy, including specific Sustainable Biomass Energy System (SBES) technologies, and iv) disseminating best practices and lessons learned from the GEF project. In particular, the project is aligned with the following GEF CCM focal areas: CCM-1: Promote the demonstration, deployment, and transfer of innovative low-carbon technologies; ii) CCM-3: Promote investment in renewable energy technologies; and iii) CCM-5: Promote conservation and enhancement of carbon stocks through sustainable management of land use, land-use change and forestry.

By promoting the establishment of community-managed forests/natural resources and the use of SBESs, the project will help Afghanistan to reduce the rate of land degradation and deforestation, while increasing the efficiency of biomass energy use. The project will reduce GHG emissions from land degradation and deforestation, as well as that from biomass burning, and therefore provide global benefits through mitigation of climate change effects. Furthermore, the project's activities will target the generation of additional environmental, social and economic benefits – for example, a shift from direct burning of animal dung to the use of sustainable biomass energy systems (SBESs) will increase the availability of animal dung for use as organic fertilizers creating the potential to enhance agricultural productivity. The project's local village-led approach will improve planning and management through the development of community-based management plans and the promotion of SBESs, thereby ensuring sustained support for the project's activities beyond the project implementation period.

2.3 EXPECTED PROJECT OUTCOMES AND OUTPUTS

Component 1: Strengthening the national policy environment to support sustainable biomass energy systems (based on CBNRM), laying the groundwork for investment promotion and future access to carbon markets.

The objective of Component 1 is to promote sustainable biomass energy use and CBNRM practices by integrating these concepts into existing national policies and practices. This component builds on the investments under the NABDP, particularly with respect to the ERDA programme and the ongoing policy strengthening that has resulted in the draft Renewable Energy Policy. Further, this component is aligned with the National Priority Programme on Energy for Rural Development (NPP 2) of the ANDS. Component 1 will promote the mainstreaming of sustainable biomass energy systems with CBNRM approach into relevant national strategies and action plans, including *inter alia*: i) the Renewable Energy Policy (currently in draft phase); ii) the proposed Renewable Energy Strategy and

Action Plan, the National Forest Management Plan; iii) the proposed Renewable Energy Roadmap (to be developed by ADB); and iv) the upcoming Provincial and District-level development plans.

The proposed revisions to ongoing development planning will be complemented with policy briefs and awareness-raising activities targeted at national-level policymakers, particularly within MRRD, MAIL, MEW and NEPA. The information generated by the project's activities – e.g. best practices and successful approaches identified project implementation – will be used as the basis for recommendations. Further, the objectives of Component 1 will be supported by the establishment of a technical working group on sustainable biomass energy (SBEWG). The working group will act as a steering body to review the technical and strategic relevance of the project's activities and ensure that the project's activities are aligned and coordinated with relevant stakeholders and ongoing initiatives, including both within government and donor-driven initiatives. In particular, the working group will coordinate closely with stakeholders related to renewable energy development, including national coordination groups such as the ICE and RECC, non-governmental groups such as the BCA, and ongoing initiatives such as ERDA. Component 1 will also develop a strategic roadmap for the long-term promotion and implementation of integrated CBNRM and SBESs beyond the project implementation period, with the guidance and input of the technical working group. The roadmap will include analyses of fiscal incentives, guidelines and regulations to assist in the integration of CBNRM and SBES into national policy frameworks and action plans – for example, National Priority Plans on Energy for Rural Development, NPP 2. The knowledge outputs and data generated by the project will be hosted on a publicly accessible online platform that will function as a biomass energy information system. The information system will collect, analyse, and disseminate data on resources and technologies for sustainable energy production and utilisation and will support the milestones specified in the aforementioned roadmap. The lack of such a system has been identified as a shortcoming in the INC, and its establishment will allow information dissemination to national partners, and will serve as basis for a national carbon accounting system. These mechanisms will provide a foundation to support further investments in renewable energy – particularly biomass energy – and CBNRM.

Baseline situation

In the baseline situation, the institutional and policy environment is complex and characterised by multiple stakeholders and ongoing initiatives with related activities, particularly with respect to renewable energy and NRM. However, at present the existing policies and sectoral strategies that relate to CBNRM and renewable energy, respectively, are limited in scope and are not integrated with related sectors. Furthermore, renewable energy policies focus primarily on promotion of solar and hydropower and there is very little emphasis on promoting improved practices for biomass energy use. At present, there is currently no process to facilitate a national dialogue around community forestry and the associated sustainable development benefits. Although there are existing policies to promote CBNRM and CBFM, at present these policies are not widely implemented in practice. Therefore, without the GEF project activities, Afghanistan's ability to integrate such activities successfully into national policy will be limited.

Incremental benefits

Under Component 1 the following outcome will be achieved:

Outcome 1 The CBNRM approach and sustainable biomass energy systems have been mainstreamed into national policies and frameworks for renewable energy and forestry.

The Outcome of Component 1 will be an enhanced institutional and policy environment to promote sustainable management of biomass energy and natural resources as a strategy for climate change mitigation and socio-economic development. This will be achieved by identifying and promoting successful practices and approaches – based on the project's activities as well as other ongoing initiatives and international good practices – to be proposed for inclusion in relevant sectoral and sub-national policies and strategies which are currently under development by other ongoing initiatives. In

particular, the project will identify appropriate approaches to promote efficient use of biomass energy, such as adoption of locally appropriate SBESs, within the upcoming Renewable Energy Strategy and Action Plan under the ERDA programme. The project will contribute proposed measures to promote SBES and sustainable biomass energy as a national priority within the proposed renewable energy roadmap to be developed within the technical assistance services provided by ADB within the project entitled “Renewable Energy Development” (2015 – 2017). Furthermore, the project will increase awareness of successful approaches to CBNRM and CBFM, in alignment with existing national forest policy, to be integrated into sub-national development plans, at the level of provincial, district and community priority plans.

The activities to strengthen the institutional environment will be planned and implemented in close participation with related stakeholders, particularly those participating in the technical working group on sustainable biomass energy. The participation of technical representatives of project partners as well as other relevant initiatives will reduce replication between ongoing initiatives and encourage cooperative action. The increased availability of information and data generated by the project’s activities will be disseminated to policy-makers in order to support improved policy and planning, and will be publicly available via an internet-based platform for biomass energy information. This biomass energy information system will serve as an online database that will increase the availability of information for future initiatives. These activities will contribute to removing the existing barriers to planning and implementing NRM- and biomass energy-related activities use within ongoing national planning.

Outcome 1 will be achieved through the following outputs and indicative activities:

Output 1.1 National policies and sectoral strategies promote integrated CBNRM and sustainable use of biomass energy (SBES).

Establish National Project Steering Committee, including representatives of all implementing partners and baseline projects. The Project Steering Committee will provide overall oversight to the implementation and coordination of project activities and will propose and select appropriate members for inclusion in project activities (e.g. the Sustainable Biomass Energy Working Group established in Output 1.2, the Provincial Coordinators appointed in Components 2&3) will be nominated by the PSC. Undertake a review of existing national and sub-national policies, plans and strategies to identify potential entry points to promote national mainstreaming of CBNRM and SBES, with a particular emphasis on renewable energy, forestry, natural resource management, rural development and climate change. National policies and strategies to be reviewed should include at least the Renewal Energy Policy (currently in draft phase), the proposed Renewable Energy Strategy and Action Plan, Rural Renewable Energy Policy, the National Forest Management Plan, and the proposed Renewable Energy Roadmap (to be developed by ADB). At the sub-national level, reviews of upcoming Provincial and District-level development plans should be prioritised.

Develop and disseminate policy briefs that provide recommendations for policy revision and strengthening, targeted at national-level policy-makers. Recommendations should include identification of opportunities to promote and implement existing policies, to mainstream an integrated approach to CBNRM and sustainable use of biomass energy in revised policies as well as sub-national development planning.

Hold training and awareness-raising workshops at an inter-ministerial level, guided by institutional review reports and policy briefs developed in Activities 1.1.1.1 and 1.1.1.2, to propose policy and legislative reform to support integrated CBNRM and SBES adoption in sectors including natural resource management, rural energy, renewable energy, and climate change adaptation/mitigation. Harmonisation of existing and proposed policies and strategies to promote integrated approaches to CBNRM and SBES at national, provincial and district-level.

Output 1.2 A cross-sectoral national-level working group on sustainable biomass energy is established and operational.

Establish a cross-sectoral technical working group on sustainable biomass energy (Sustainable Biomass Energy Working Group, SBEWG) within the Renewable Energy Working Group. The

SBEWG will emphasise coordination with existing projects and initiatives related to technical assistance and policy strengthening on renewable and biomass energies, including the Biogas Consortium of Afghanistan (BCA, Renewable Energy Coordination Committee (RECC) and Interministerial Committee on Energy (ICE). SBEWG should represent the technical interests of relevant government departments - including *inter alia* NEPA, MAIL, MRRD and MEW - as well as interested academia, NGOs, and project implementation partners.

Establish the objectives, mission statement and coordination structure for the SBEWG. This should include clear elaboration of the roles and responsibilities of members.

Undertake a participatory capacity and capacity needs assessment within newly established technical working group to identify priority information and capacity development needs to support improved integration of biomass energy into sectoral strategies, particularly with respect to forestry, NRM, renewable energy and rural development. The needs assessment should include consideration of gaps in technical data and information to support knowledge-based decisions on appropriate SBES to be promoted in Afghanistan.

Develop proposed milestones and priority programmes to support implementation of integrated SBES and CBNRM planning within national and provincial planning and national climate change response. Milestones to be included should include at least: i) measures to address technical data and information needs to support monitoring of GHG emission reductions; ii) national and provincial capacity-building activities to support increased investment and promotion of integrated SBES and CBNRM; iii) increased participation in multilateral agency programmes to promote and finance climate change mitigation activities.

Provide annual reports on the progress towards objectives and milestones of the SBEWG to inform adaptive management.

Output 1.3 A roadmap developed for sustainable biomass energy systems in alignment with CBNRM principles, including investment promotion and access to carbon markets, in line with the National Forest Plan and National Priority Programme on Natural Resource Management and Conservation.

Undertake an assessment of investment needs, current and future financing options and commercial opportunities to support increased investments in SBES, including improved management of forestry and natural resources to meet demand for biomass fuels. The assessment should include existing assessments and studies such as the NREL 'Biomass Resources in Afghanistan', the recommendations of relevant ongoing projects and programmes such as UNEP's LCDF1 project.

Develop a roadmap for promotion of integrated SBES and CBNRM at a national level, in alignment with proposed policy strengthening activities in Output 1.1 and the objectives of the SBEWG in Output 1.2

Review progress towards achievement of roadmap milestones on an annual basis and provide recommendations and adaptive management strategies as necessary.

Output 1.4 A biomass energy information system that collects, analyses, and disseminates data on resources and technologies for sustainable energy production and utilisation, as basis for promotion of SBES in alignment with CBNRM principles.

Establish MoU with UNEP's Climate Technology Centre and Network (CTCN), to be launched in 2015, to host the emerging biomass energy information system.

Undertake a review of existing methodologies for estimating energy efficiency, energy production, and GHG emissions, relevant to biomass energy systems, to establish a reporting standard and methodological approach to research technical performance of piloted SBES. The purpose of the methodological review is to establish an approach for assessing the technical performance of SBES piloted by the project and other initiatives, in alignment with international best practice on GHG monitoring and carbon credit generation. The methodologies to be included in the review should include existing examples of international best-practice for GHG monitoring under the Clean Development Mechanism as well as the Verified Carbon Standard.

Research, analyse and disseminate information on the performance of piloted SBES through the biomass energy information system. Data and information on performance of piloted SBES should be packaged for dissemination in media and language tailored to the needs of the intended audiences.

This should include at least two popular (or 'grey') articles targeted at household users of SBES, two policy briefs targeted at national-level technical staff within relevant government departments, and two peer-reviewed scientific publications (generated under Component 3).

Develop a mid- and long-term plan to sustain and upscale the biomass energy information system, including the elaboration of funding sources and identification of appropriate web-based platforms to be linked to the biomass energy information system (such as the Afghanistan Environmental Data Centre under development by UNEP, WCS and NEPA).

Component 2: Developing community-based natural resource management (CBNRM) plans and establishing community forests in 2 project areas.

Component 2 will promote Community-based Natural Resource Management (CBNRM) in Afghanistan by focusing on the establishment of functioning CBNRM plans implemented by community-based Forest Management Committees (FMCs) in two pilot project areas. The proposed project areas are Dara-e-Noor district in Nangerhar and Salang district in Parwan – these proposed sites should be reassessed and validated during the implementation phase according to the Site Selection Criteria detailed in Appendixes. CBNRM is an approach under which communities are assigned legal responsibility for the management of natural resources (e.g. forests, rangelands, water) within a designated area. CBNRM is based on the principle that the active participation of local communities in the management of natural resources is a cost-effective approach to increasing productivity and household income while also generating environmental co-benefits¹. Consequently, the success of any CBNRM initiative requires the willing participation of communities and should be complemented by awareness-raising and training activities to build the capacity of local institutions.

Within the scope of this project, activities related to CBNRM under Component 2 will be coordinated with the promotion of sustainable biomass energy use and associated technologies (SBES) within Component 3. The integration of these two components will support the mutual sustainability of activities and will maximise the GHG mitigation potential of the project's activities. The project will build on the ongoing activities of baseline projects and other ongoing initiatives – particularly in the sectors of natural resource management, rural development and community governance – to establish and implement CBNRM plans in participation with government extension officers and representatives of district- and community-level governance (District Development Assemblies, DDAs, and Community Development Councils, CDCs, respectively). Through the implementation of CBNRM plans, the project will establish community forests which will provide a sustainable supply of wood to supplement current biomass sources. These activities will be undertaken through extant community and district-level structures (FMCs, CDCs, and DDAs) and will increase the viability of the project's activities related to the promotion of SBES (cf. Component 3). It is anticipated that this integrated approach will reduce competition for resources at a local level and will promote community participation in the scheme. The community forests will be situated in order to maximise their usefulness in providing valuable ecosystem services (in terms of reduced soil erosion, increased water filtration and slope stabilisation), and the selection of plant species should prioritise those which generate multiple benefits (such as fruits and nuts, or forage), in addition to the provision of wood for biomass fuel to be used in SBESs.

The design and implementation of CBNRM plans by communities will be strongly reliant on the willingness and participation of communities to participate in the project's activities. Consequently, the project will rely on the appointment of a suitably qualified Technical Service Provider (TSP) – preferably a locally-based non-governmental organisation with relevant experience in the project area and related activities – to lead the process of community sensitisation, awareness-raising and training. The French NGO MADERA is proposed as a suitable TSP with extensive experience in capacity-building, training and awareness-raising in rural Afghanistan. MADERA has previous

¹ The World Bank (2004). "Sourcebook: agricultural investment", module 5 - community-based natural resources management.

experience in working with forest management associations and other aspects of natural resource management and is currently implementing a project with a strong CBNRM focus in the Central Highlands. Furthermore MADERA is well-known and respected both by local communities but also within government and is a formally appointed Facilitating Partner of the NSP under MRRD.

Upon the appointment of a TSP, the project's field-based activities under Component 2 will be coordinated by Provincial Coordination Units (PCUs) hosted within Provincial DAIL offices. TSP's will report to Provincial Coordinators appointed by FAO and will designate an experience Team Leader (TL) and at least two Assistant Extension Officers (AEOs) to coordinate the implementation of Component 2 activities within each of the two pilot provinces. TSPs will be responsible for the development and implementation of training programmes (and associated training toolkits, to be generated as a knowledge output of the project) targeted specifically at sub-national government extension officers, and forest-managing communities, respectively. The investments in capacity-building and training of these two groups of stakeholders will be ongoing throughout the project implementation period and will be supported by ongoing technical assistance and extension advice from AEOs and FAO. Communities will be assisted to establish FMCs, undertake a participatory process of mapping nearby forests and natural resources, and develop management plans and activities in an open, collaborative fashion. The active participation of communities in the selection of management activities, complemented by training and capacity-building, will ensure that the project's activities are locally relevant and have the support of local community members, therefore supporting sustained implementation of CBNRM plans beyond the project implementation period.

Baseline situation

As a result of widespread deforestation and land conversion, the LULUCF sector is the largest contributor to national GHG emissions. At present, formal management of forests and other natural resources is primarily undertaken by MAIL through the DoF and DoNR. Although national forest policy promotes the management of forests and natural resources by community-based structures such as FMCs, in practice there is limited experience and a low level of awareness of how to establish FMCs and assist them to design and implement CBNRM plans. Consequently, in the absence of GEF resources, the management of forested areas and other natural resources is likely to remain centralised through MAIL while the decentralisation of NRM to communities will only be implemented in a fragmented *ad hoc* fashion by donor-driven initiatives. The underlying drivers of deforestation and degradation will not be addressed and as a result the emission of GHGs from land-based sources such as forests and rangelands will continue to be a major contributor to Afghanistan's GHG emission footprint.

Incremental benefits

Activities under Component 2 will result in the achievement of :

Outcome 2 The CBNRM approach has been incorporated in targeted areas at a district scale.

Outcome 2 will be achieved through the establishment of local capacity and experience for promoting CBNRM and providing technical support to participating communities. Activities within Component 2 will be undertaken in coordination with Component 3 and will: i) introduce integrated approaches to management of natural resources combined with efficient use of biomass fuels; ii) assist willing communities and government extension officers to establish Forest Management Committees (FMCs), and to design and submit locally appropriate management plans for natural resources for approval by DAIL. These Outcomes will be supported by the development of ongoing training tools and programmes tailored according to the specific needs of government extension staff and FMCs, respectively.

The project will aim to establish and capacitate at least 10 FMCs across the project districts (Dara-e-Noor in Nangerhar and Salang in Parwan, respectively). The project will initially focus on providing training, capacity-building and technical assistance to existing FMCs within the pilot districts which have been established but which have not yet completed or submitted CBNRM/CBFM plans (detailed further in Appendix 9). With the assistance of trained government extension staff,

technical service providers and FAO technical support, FMC members will be provided with ongoing training and capacity-building to design and implement CBNRM plans. Furthermore, the project will assist interested communities to organise and establish new FMCs to be included in further capacity-building and training for implementing CBNRM plans.

The implementation of CBNRM plans by the newly established and trained FMCs will be undertaken across a targeted area of at least ~12,000 ha in each of the two pilot districts, resulting in a total reduction of GHG emissions by at least ~36,820 tonnes CO₂e over the project's three-year implementation period.

Over a 20 year period, the project's activities will contribute to a **total reduction of GHG emissions of ~696,819 tonnes CO₂e**.

Outcome 2 will be achieved through the following outputs and related activities (elaborated further in Appendix 10.1):

Output 2.1 At least thirty (30) representatives of provincial and district-level government in pilot areas trained on CBNRM and SFM.

Establish two Provincial Coordination Units (PCU) in Parwan and Nangarhar Provinces, including local representatives of all implementing partners and baseline projects. The PCUs will be established within Provincial MAIL offices and will coordinate the implementation of project activities in pilot districts in participation with district-level authorities and Community Development Councils established through the NSP. The establishment of the PCUs will initiate activities related to CBNRM and SBES under Components 2 and 3, respectively.

Develop Module 1 of the updated training toolkit for governmental extension officers on integrated CBNRM and SFM principles, based on best-practice guidelines and successful approaches developed through past and ongoing related initiatives in Afghanistan. Training toolkits will focus on increasing capacity of provincial extension officers to introduce the principles of Community Based Natural Resources Management (CBNRM) and Sustainable Forest Management (SFM) to decentralised community management associations, in alignment with National Forest Policy. Training toolkits produced in support of this component will include a focus on *inter alia*: i) supporting communities to establish Forest Management Committees (FMCs) within CDCs; ii) supporting community-based inventories and mapping of forests and natural resources; iii) establishment of management plans for sustainable use of forests and natural resources; iv) establishment of community-managed nurseries for restoration of degraded ecosystems; v) management of forests and natural resources for generation of sustainable biomass fuels; vi) establishment and management of community-based woodlots for generating sustainable biomass fuels in alignment with activities under Component 3; and vii) promotion of CBNRM and SBES as part of a strategy to adapt to, and mitigate against, climate change.

Through the PCUs established in two pilot provinces, identify provincial technical staff from governmental line agencies to be included in training activities on integrated CBNRM, based on best-practice guidelines and successful approaches developed through past and ongoing related initiatives in Afghanistan. In each of two pilot provinces, technical staff to be trained should include at least five (5) extension officers from each of the following ministries and agencies: i) NEPA's Climate Change departments; ii) MAIL's provincial NRM departments; and iii) MRRD's provincial staff.

Design and implement a continuous training programme for governmental extension officers based on training toolkit established in Activity 2.1.1.2. The training programme and training toolkit will be reviewed and updated systematically according to successful approaches and activities identified during the project implementation period.

Output 2.2 Representatives of at least twenty (20) CDCs, in at least two (2) pilot areas, trained on CBNRM and SFM principles.

In participation with governmental extension staff trained under Output 2.1.1, apply and update the site selection criteria developed during the PPG phase to identify potential sites and communities to participate in CBNRM and SFM.

Based on the potential sites and communities identified in Activity 2.1.2.1, undertake participatory workshops with representatives of District Development Authorities (DDAs) and Community Development Councils (CDCs) to introduce the project's proposed activities and identify eligible and willing communities. Communities which have already established FMCs, or which have expressed interest in establishing FMCs, should be prioritised for inclusion. The approach to Participatory Rural Appraisals (PRAs) should be informed by the best practices established by other related initiatives e.g. FAO/UNEP's SAISEM project, UNEP's BERA programme.

Develop Module 1 of the updated training toolkit and ongoing training programme for households on community-based approaches to NRM and SFM. Training toolkits will be aligned with the content of the Module generated under Output 2.1.1, and will focus on increasing capacity of communities to design and implement decentralised CBNRM and SFM management plans, with the support of district- and provincial-level extension officers. Training toolkits and training programmes will include a focus on *inter alia*: i) community-based inventories and mapping of forests and natural resources; ii) establishment of decentralised local management plans for sustainable use of forests and natural resources; iii) establishment of clear and feasible targets to be achieved by CBNRM management plans; iv) establishment of community-managed nurseries for reforestation and establishment of woodlots; v) management of forests and natural resources for generation of sustainable biomass fuels; vi) establishment and management of community-based woodlots for generating sustainable biomass fuels in alignment with activities under Component 3; and vii) identifying and promoting opportunities to increase household income through sustainable management of commercially valuable NTFPs generated by community-managed areas.

Design and implement a continuous training programme for FMCs based on training toolkit established in Activity 2.1.2.3. The training programme aims to include at least ten (10) representatives from at least ten (10) FMCs and/or CDCs interested in establishing FMCs, in each of two (2) pilot provinces, annually. The training programme and training toolkit will be reviewed and updated systematically according to successful approaches and activities identified during the project implementation period. The training programme will aim to include at least five (5) additional new CDCs in the second and third years of the project.

Develop and implement a district-wide programme to raise awareness on the concept of CBNRM and the potential for communities to secure rights to manage forest resources through establishment of FMCs and CBNRM plans. The awareness-raising programme should include incentives to motivate CDC representatives to apply for training, including access to subsidised SBESs in Outcome 3.

Output 2.3 Community-based natural resource management plans and community forest plans designed in 2 pilot areas in Parwan and Nangarhar Provinces, promoting sustainable biomass investments through sustainable forest management (SFM) principles and methods and providing additional livelihood benefits.

Produce high-quality spatially detailed maps and inventories of forests and natural resources within pilot districts based on updated and freely available geospatial imagery (including satellite imagery such as LANDSAT, data held by aligned agencies such as UNOPS or other sources, as relevant) to support information-based decision-making by community members. Geospatial analyses should be undertaken through a suitably qualified external service provider such as Treemetrics or with the provision of Technical Support Services by FAO.

FMCs established and trained under Output 2.1.2 undertake participatory mapping of surrounding natural resources, including forests, rangelands and agricultural areas within pilot districts. Maps produced under Activity 2.1.3.1 will be updated to reflect community-driven mapping of resources and areas to be prioritised for management.

FMCs identify priority activities to be introduced within proposed CBNRM plans, including: i) restoration and revegetation of degraded forest and rangeland areas; ii) establishment of nurseries for producing locally adapted plant species, with an emphasis on commercially valuable NTFPs and woodfuel-producing species to support sustainable biomass energy generation; iii) establishment of woodlots to supplement availability of sustainable biomass fuels; iv) use of 'Qorog' system and other appropriate methods of reducing extraction pressure on forests; and v) establishment of sustainable rates of use of natural resources in forest and rangeland areas, with an emphasis on commercially valuable NTFPs, woody biomass, and grazing areas for livestock.

FMCs, with the support of implementation partners and district-level extension officers, prepare and submit Natural Resource Management (NRM) plans for approval by Provincial MAIL offices in alignment with provisions for CBNRM under National Forest Policy.

FMCs review and, if necessary, revise CBNRM plans based on ongoing community-based monitoring and evaluation and identified successful approaches/best-practices in Output 2.4.

Output 2.4 Community forest and natural-resource management plans (see 2.3) implemented in at least 24,000 hectares in 2 pilot areas, increasing sustainable wood supply for bioenergy purposes, and enhancing local livelihoods.

FMCs implement sustainable management of forests and natural resources according to CBNRM plans, including monthly ongoing monitoring of usage rates by individual fmc members. Monthly monitoring of usage rates of forest and natural resources should include *inter alia* reporting of livestock grazing, collection of woodfuel from woodlots and forests, and collection of commercially valuable NTFPs generated by community-managed areas.

FMCs establish nurseries for revegetation of priority degraded forest and rangeland areas and for establishment of woodlots to supplement sustainable biomass fuels. Block grants are made available to communities to support initiation of activities prioritised by communities, including *inter alia* establishment of nurseries, purchase of seedlings, establishment of *Qorog*, establishment of woodlots and agroforestry plots.

FMCs undertake periodic monitoring and inventories of natural resources, including forestry resources, using appropriate low-cost, simple techniques. Communities are provided with ongoing training and extension support to undertake periodic monitoring and inventories of forest areas. Communities will also be provided with a basic package of forest monitoring equipment including *inter alia* GPS-enabled mobile phone with camera, calipers, measuring tape, signposts, set square and stationery.

FMCs implement ongoing mechanisms for forest protection including establishment of *Qorog* exclusion fences, patrols by local forest guards, and enforcement of controlled sustainable grazing management plans.

Component 3: Promoting the demonstration and deployment of sustainable biomass energy systems, with a CBNRM approach.

Under Component 3, the project will demonstrate the benefits of efficient approaches and technologies for household use of biomass energy, particularly through the adoption of Sustainable Biomass Energy Systems (SBES), as a strategy for climate change mitigation, environmental protection and rural development. Activities within Component 3 are intended to be complementary to, and coordinated with, activities related to CBNRM under Component 2. Consequently, the project will emphasise the demonstration of SBESs particularly within the two proposed pilot areas of Dara-e-Noor district in Nangerhar and Salang district in Parwan. These proposed sites should be re-assessed and validated during the implementation phase according to the Site Selection Criteria in Section 2.1).

The demonstration of SBESs – and associated activities related to awareness-raising, training and capacity building by communities – will be strongly reliant on the willingness and participation of communities to participate in the project's activities. Consequently, the project will rely on the appointment of a suitably qualified Technical Service Provider (TSP) – preferably a locally-based non-governmental organisation with relevant experience in the project area and related activities – to lead the process of community sensitisation, awareness-raising and training. The NGO BORDA is proposed as a suitable TSP with extensive experience in capacity-building, training and awareness-raising in rural Afghanistan, with particular expertise in promoting and demonstrating renewable biomass technologies such as anaerobic biogas digesters. BORDA has established Memorandums of Understanding as a technical service provider and facilitating partner of both MRRD and MEW, has previous experience in working with community-based organisations to increase access to sustainable energy, and is currently implementing projects with a focus on biogas digesters in the Central Highlands province of Bamiyan. BORDA has a strong focus on building technical capacity for implementation of SBESs, including both at the community level and at the level of national technical

staff and policy-makers. Finally, BORDA's activities also include provision of training on how to design, construct and market biogas digesters and is therefore suitably experienced to lead the development of activities under Component 3.

Following the appointment of a TSP to lead the development of SBES demonstration, training, and capacity-building, the project will implement Component 3 in a phased approach that will gradually identify and upscale successful approaches and technologies over the course of the project's three-year implementation period. The first year of project implementation will be used to pilot the demonstration of SBESs in a small number of willing households within participating communities. In the first year of implementation, the project will aim to demonstrate at least three kinds of SBES technology, including Fuel-efficient Cookstoves (FECs), Fuel-efficient *Bukhari* (FEBs) and anaerobic biogas digesters. This initial pilot phase will be used to sensitise communities to the potential benefits of the piloted technologies, thereby reducing local scepticism for unfamiliar or non-traditional approaches. The suitability of the selected SBESs to the local context will be assessed during this pilot phase, including through undertaking scientific research to assess the performance of SBESs demonstrated. A strong emphasis will be placed on consulting the participating households on the performance and suitability of the SBESs. Based on the experiences of past projects, this approach can potentially be used to improve the efficiency and user-friendliness of the designs by soliciting feedback from users.

Following the initial pilot phase of the first year of project implementation, the project will upscale the demonstration of successful SBES by increasing the number of SBESs in communities who participated in the first pilot phase and also by demonstrating SBES in new communities, replicating the approach undertaken in the first year. Finally, the third year of project implementation will see the further replication and upscaling of successful approaches to include the participation of additional communities and households. This phased approach promoted by the project is based on the recommendations of several stakeholders and past initiatives, most importantly the emphasis on 'starting small' and promoting successful approaches to interested communities. Importantly, this approach allows some flexibility with respect to the number of households and communities that will participate, and also with respect to the specific technologies that will be promoted in each of the two pilot districts.

The proposed targets for SBES demonstration aim to increase annually over the three years of the project implementation period within a proposed minimum of 20 CDCs at each of two pilot sites (detailed further under Outcome 3, below).

Throughout the implementation phase, a strong emphasis will be placed on providing training and capacity-building to both provincial-level government extension staff as well as to members of participating communities. The TSP will be responsible for the development and implementation of targeted training programmes as well as training toolkits, which will be generated as a knowledge product of the project to be publicly disseminated via the online platform developed under Component 1. In addition to providing this introductory training to government staff and community members, the project will also target at least five skilled government staff to be sent for specialised technical training on bioenergy through an international workshop hosted by the Chinese Academy of Sciences (CAS). This investment in capacity-building will contribute to the establishment of a national pool of expertise on bioenergy, thereby supporting the capacity development objectives of MRRD, MEW and BORDA and ensuring that the project's activities can be sustained and upscaled beyond the implementation period.

An important output of this component is the undertaking of detailed scientific research to assess the technical performance, efficiency and GHG mitigation potential of SBESs demonstrated by the project. It is proposed that this work can be undertaken by the KURE laboratory with the input of TSPs, FAO representatives and the technical working group established under Component 1. The results of research on SBESs should be prioritised for publication in academic journals, thereby institutionalising the information generated and ensuring that future initiatives can benefit from research undertaken. Research results will also be used to inform policy briefs and awareness-raising

materials and will eventually inform the recommendations of proposed policy revisions and implementation plans under Component 1. Finally, the results of technical research into SBESs will support the monitoring of the project's impacts, particularly with respect to GHG emissions, and can be used to improve and prioritise appropriate technologies to be promoted by the project.

Outcome 3 Innovative and sustainable biomass energy technologies, tested and deployed in two pilot areas.

Baseline situation

In the baseline situation, ~75% of Afghanistan's population live in rural areas. Within these rural areas, less than 4% of households have access¹. The lack of access to electricity at present is significant in light of the fact that over half of Afghanistan's Gross Domestic Product (GDP) came from rural areas in 2012. There is therefore a severe crisis in terms of meeting household energy and fuel demands². Virtually all rural households are dependent on solid biomass fuels to supply energy for cooking and heating³. These fuels typically include wood, crop residues or dried animal dung, and their use has resulted in significant deforestation and land degradation. Historically and culturally, fuel collection and cooking are roles that are typically filled by women, and consequently the reduction in available fuel, as well as any changes in fuel-burning efficiency, has a differentially high impact on women's lives and health. Consequently, there is an urgent need to develop improved alternatives to traditional biomass energy use to limit the negative environmental, social and health impacts of unsustainable biomass fuel use. Several previous initiatives have promoted approaches such as the adoption of SBES, however there remains a low level of awareness and adoption of these technologies. At present, national policies for energy and rural development focus primarily on the promotion of renewable energies such as solar and hydropower. Therefore, without GEF resources, it is likely that rural households in the target sites will continue to depend on unsustainably managed forest resources to supply biomass energy for inefficient cooking and heating, continuing or exacerbating current levels of deforestation and land degradation. As a result, burning of biomass fuels will remain a significant contributor to GHG emissions and will continue to result in negative health impacts and environmental degradation.

Incremental benefits

Under Outcome 3, the project will promote and demonstrate at least three approaches to sustainable biomass energy using SBESs such as fuel-efficient cookstoves and *bukhari* heaters (FECs and FEBs) and anaerobic biogas digesters. The activities related to promotion of SBESs will be undertaken in coordination with promotion of CBNRM within Component 2 and will focus on the same communities and intervention sites as far as possible. Activities to promote SBESs will be complemented by training programmes and toolkits targeted at sub-national government staff, and community representatives, respectively. The training and awareness-raising activities targeted at communities under this Outcome will aim to include representatives of at least 20 CDCs in each of the two pilot districts. The promotion and distribution of SBESs will be undertaken in a phased approach that will demonstrate the proposed SBESs to a small selection of households in the first year of project implementation (aiming to reach at least 10 CDCs in each of the two pilot districts). Technical studies on the user preferences, fuel use efficiency and GHG emissions of piloted SBESs will be undertaken under Outcome 3.2 to inform further design improvements and identify successful approaches to be upscaled. Following the initial pilot phase, the project will increase the scale of SBES promotion in the second and third years of implementation, aiming to disseminate at least ~1800 low-cost FECs/FEBs and ~120 anaerobic biogas digesters. The proposed pilot phases in Years 1, 2 and 3 are detailed further below. The costs of procurement of SBESs will be subsidised by GEF resources by a proposed amount

¹ GoIRA, 2007. Energy Sector Strategy for the Afghanistan National Development Strategy.

² Hassan, Z. and P. Kant, 2011. REDD in Afghanistan: Empowering Women and Increasing Access to Energy. IGREC Working Paper IGREC-20: 2011, Institute of Green Economy, New Delhi.

³ Smith KR, Mehta S, Feuz M (2004) Indoor smoke from household solid fuels. In: Ezzati M, Rodgers AD, Lopez AD, Murray CJL (eds) *Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors*, Geneva: World Health Organization, Vol 2.

of 50%, to be validated in participation with CDC representatives during the implementation phase. The level of subsidy should be assessed on at least an annual basis to balance the concerns that: i) an inadequate subsidy reduces the incentive for communities to invest in SBESs; and ii) an excessive subsidy reduces the potential for upscaling the project's activities.

In Year 1, the project will target the participation of ~10 CDCs in each pilot district, a total of 20. The biogas digesters, which are relatively expensive and time-consuming to construct, are anticipated to be more difficult to promote in all participating communities, therefore a target of ~5 communities to receive biogas digesters is proposed for the first year while the low-cost FECs should be promoted in ~10 communities in each pilot area. Based on stakeholder consultation and past project experience, it is recommended to install a minimum of 3 digesters in any community in order to increase the visibility of the system and to encourage community members to discuss the SBESs and share ideas.

Following the first year of project implementation, the technical performance and community impressions of the piloted technology will be assessed. This information can be used to update or revise the proposed implementation plan based on identification of successful approaches, potential improvements and community feedback on energy needs. Subsequently, the second phase of the implementation period, in Year 2, will focus on upscaling the project's activities within the participating communities as well as replicating the approach in additional neighbouring communities. The same approach to reviewing, updating and upscaling will be adopted for the final phase of project implementation in Year 3. The programmatic approach to piloting and upscaling demonstration of SBES is proposed in table 11 below.

Table 11. Proposed programmatic approach to piloting and upscaling the demonstration of SBES.

SBES	Number of locations (across two districts)	Units per location per year			Total number of new units
		Year 1	Year 2	Year 3	
Biogas digesters	10	3			30
FE Bukhari	20	5			100
FE Cookstove	20	5			100
Biogas digesters	10		3		30
FE Bukhari	40		10		400
FE Cookstove	40		10		400
Biogas digesters	20			3	60
FE Bukhari	40			10	400
FE Cookstove	40			10	400
Total	40				1920

Consequently, an estimated 1,800 FE stoves and 120 biogas digesters will be distributed through the project's activities, thereby benefiting ~13,500–14,000 people in Dara-e-Noor and Salang districts. Emission reductions resulting from the dissemination of SBESs are estimated to be ~10,297 t CO₂e over the project implementation period. These estimates will be revised over the course of the project implementation period based on improved technical data and assessments originating from research under Output 3.3.

Currently, renewable energy policies and investments are focused primarily on promotion of solar and hydropower technologies and there is no process to develop skills or capacity to promote sustainable biomass energy technologies. In general, there is a low level of awareness of SBESs and alternative biomass fuel options among rural communities. Within government, particularly at the level of sub-national government extension officers, there is some fragmented awareness of the benefits of SBESs as a result of previous initiatives, however there is very limited technical capacity to develop and implement SBES-related activities within ongoing rural development programmes. Furthermore, the limited availability of technical information such as production costs, lifespan and fuel use efficiency

of SBESs prevents further investment by entrepreneurs and promotion by policy-makers. Educational facilities such as the Vocational Training Centres (VTCs) currently do not offer courses or training related to production or marketing of SBES technology such as biogas digesters or efficient stoves, and in consequence there are very few private entrepreneurs involved in the manufacture of improved SBESs. In response to these gaps in knowledge and capacity, initiatives such as the Biogas Consortium of Afghanistan (BCA) have been established. The BCA will function as a knowledge hub to inform interested parties, policies and planners in best practices, socio-economic aspects and to consolidate and disseminate lessons learnt from the development of biogas in Afghanistan. However, this is a newly formed, voluntary organisation, with no mandate as yet.

Therefore, without GEF resources, the GoIRA will continue to rely on isolated, *ad hoc* projects that do not provide a coordinated framework for the mainstreaming of SBESs in Afghanistan. Limited capacity to monitor and evaluate the sustainability of SBESs will continue to be a barrier to increased investments in SBESs.

Under Output 3.3 within Component 3, GEF resources will be used to establish technical skills, training tools and scientific research to enhance Afghanistan's capacity to adopt improved, sustainable practices for efficient biomass fuel use. These investments will include undertaking and publishing scientific research on the SBESs piloted by the project, thereby supporting monitoring of the project's impacts in addition to establishing technical capacity and a knowledge base to inform future initiatives. The project will engage technical service providers to develop locally appropriate training programmes and training toolkits targeted at government extension staff, to increase the awareness and technical capacity of these stakeholders to promote SBESs (targeting at least 30 government staff within the two pilot provinces). In addition to the basic training provided to government staff in the pilot provinces, GEF resources will be used to train at least five (5) national experts in bioenergy to establish a foundation of technical expertise within government's renewable energy engineers. Finally, to support private investment and promotion of SBESs, GEF resources will be used to train artisans such as tinsmiths, masons, and plasterers to design, manufacture and market the SBESs piloted by the project within Outcome 3, thereby establishing a base of skills and interest to supply SBESs to local markets.

Outcome 3 will be achieved through the following outputs and indicative activities (elaborated further in Appendix 10.2):

Output 3.1 At least two sustainable biomass energy technologies (SBES) (including household-scale biogas digesters and efficient bukhari stoves for cooking and heating) tested and deployed in 2 pilot areas with a CBNRM approach

Establish two Provincial Coordination Units (PCU) in Parwan and Nangarhar Provinces, including local representatives of all implementing partners and baseline projects. The PCUs will be established within Provincial MAIL offices and will coordinate the implementation of project activities in pilot districts in participation with district-level authorities and CDCs established through the NSP. The establishment of the PCUs will initiate activities related to CBNRM and SBES under Components 2 and 3, respectively.

In alignment with the biomass energy roadmap developed under Component 1 and in participation with the BEWG, prepare and present an updated portfolio and workplan to describe the SBES approaches that will be promoted through the project in three annual phases. SBES technologies that will be promoted will include at least the following: i) locally constructed biogas digesters, fuelled by livestock waste, based on the design and training activities promoted by BORDA; ii) low-cost SBES for cooking, particularly the fuel-efficient cookstove (FEC) based on the stove design promoted and distributed by UNEP in Koh-e-Baba project; and iii) low-cost SBES for household heating, particularly a fuel-efficient *Bukhari* stove (FEB) based on the stove design promoted and distributed by USAID in the ILGNRM project.

Pilot phase 1a of SBES Demonstrations: Distribute demonstration models of two low-cost SBES, including a Fuel-efficient Cookstove (FEC) and an Improved Bukhari stove (IBS), to be tested by interested households in pilot areas. The proposed target for the initial phase of SBES promotion is to

distribute at least ten (10) SBES units per participating CDC, across at least ten (10) CDCs per pilot area i.e. ~200 SBES units to be distributed for Phase 1 of initial demonstration. Members of existing FMCs should be prioritised to benefit from SBES distribution. Construction of low-cost SBESs will be undertaken by the tinsmiths trained under Output 3.4. Collection of household energy data should be prioritised from those households benefitting from demonstration SBES, in exchange for free demonstration model of low-cost SBES.

Pilot phase 1b of SBES Demonstrations: Install household-scale biogas digesters in participation with interested households in pilot areas. An initial target of installation of at least three (3) digesters per participating community is proposed, in at least five (5) CDCs, in both pilot areas i.e. at least thirty (30) digesters in total. Construction of biogas digesters will be undertaken by the masons trained under

Output 3.2 Forty (40) communities trained on the operation and maintenance of piloted SBES, as well as on practical measures to increase availability and efficiency of use of biomass.

Engage representatives of CDCs in pilot areas in consultative workshops to: i) identify primary household energy needs and priorities; and ii) introduce and demonstrate the benefits of the SBES to be promoted by the project. Identification of appropriate communities to be included should be aligned with the community engagement process outlined in Output 2.2.

Develop Module 2 of the updated training toolkit for households on integrated CBNRM and SFM principles, focusing on promotion of Sustainable Biomass Energy Systems (SBES). Training toolkits will be separated into modules for men and women, based on user needs identified during consultations held in Activity 3.1.2. Training toolkits produced in support of this component will include a focus on increasing the awareness and knowledge of communities on *inter alia*: i) methods and approaches for increasing the efficiency of biomass-based cooking and heating systems; and ii) methods for displacing woody biomass fuels by adopting alternative renewable energies.

Undertake pilot training programme on efficient use of woody biomass fuel for cooking and heating, based on toolkit developed in Activity 3.1.2. This component of the pilot training programme will be focused on CDCs engaged through Activity 3.1.2 on a pilot demonstration basis. An initial target of 100 men and 100 women from participating households is proposed, representing at least 10 CDCs in each of two pilot areas. Members of existing FMCs should be prioritised for inclusion in training programmes. Training activities that should be prioritised include: i) operation and maintenance of low-cost SBES; ii) environmental, economic and health benefits of reduced biomass use; iii) methods and approaches for fuel-efficient cooking; and iv) potential alternative sources of biomass fuel such as biomass briquettes, woodlot management and crop residue collection.

Undertake pilot training programme on displacing woody biomass fuels by adopting alternative renewable energies, based on toolkit developed in Activity 3.1.2. This component of the pilot training programme will be focused on CDCs engaged through 3.1.3 on a pilot demonstration basis. Members of existing FMCs should be prioritised for inclusion in training programmes. An initial target of 30 men and 30 women from participating households is proposed, representing at least 5 CDCs in each of two pilot areas. Training activities should be based on those outlined in Activity 3.2.3 but should also include a focus on: i) operation and maintenance of household-scale biogas digesters, including during winter; ii) potential applications of biogas slurry as a fertiliser and supplementary household fuel; and iii) monitoring of energy and gas volumes generated by biogas digesters.

Output 3.3 Research findings and appropriate technology innovations on integrated CBNRM and SBES (see 2.1.1) for dissemination among the national and regional research networks, involved policy-makers and the general public, including through the biomass energy information system (see 1.4).

Establish Memorandum of Understanding between Kabul University Renewable Energy (KURE) Lab and Implementing Partners to define: i) research objectives; ii) data gaps; and iii) roles and responsibilities, to be addressed by technical research programme on SBES demonstrated by the project. In particular, these details should be aligned with the research needs elaborated by the SBEWG established in Component 1.

In participation with KURE and Implementing Partners, initiate technical studies on at least two of the three piloted SBES to: i) address technical information gaps to assess the fuel use efficiency,

annual energy production, and reduced emissions, as a result of SBES adoption; and ii) improve the design of piloted SBESs, particularly with respect to user-friendliness and energy efficiency.

In participation with KURE and Implementing Partners, provide funding and technical support to two post-graduate students to undertake research projects identified in Activity 3.3.2.

Design and manufacture prototypes of improved SBESs based on: i) feedback and recommendations from household-level users identified in Output 3.1.1; and ii) technical data generated by Activity 3.3.2 - 3.3.3.

Based on research undertaken in Output 3.3 – particularly research focused on demonstration activities piloted in Activity 3.1.3 and Activity 3.1.4 – assess the suitability, technical performance and cost-effectiveness of piloted SBES technologies and propose revisions to the workplan and portfolio established in Activity 3.1.2, if necessary, to inform Pilot Phase 2 of SBES Demonstrations. The revised workplan and portfolio should include any technical refinements or revised design of SBESs resulting from ongoing research and development.

Pilot phase 2a of SBES Demonstrations: Increase distribution of two improved low-cost SBES that have been demonstrated and improved based on Pilot Phase 1a. The proposed target for Phase 2a of SBES demonstration is to: i) increase the distribution of SBES within participating CDCs by at least ten (10) households in at least ten (10) CDCs in each of two pilot areas; and ii) to expand pilot demonstrations of SBESs to at least ten (10) households in at least ten (10) additional CDCs in each of two pilot areas. i.e. increase number of households using SBES in existing participating CDCs by at least 400, and to introduce demonstrations of SBES into at least 400 households in newly participating CDCs.

Pilot phase 2b of SBES Demonstrations: Increase distribution of household-scale biogas digesters that have been demonstrated and improved based on Pilot Phase 2a. The proposed target for Phase 2b of SBES demonstration is to install at least three (3) digesters per participating community, in at least five (5) CDCs, in both pilot areas i.e. at least thirty (30) digesters in total. SBES demonstrations should prioritise the inclusion of CDCs that did not participate in Phase 2a if possible.

Repeat steps of Activity 3.1.4 - 3.1.6, to revise the proposed SBES portfolio and workplan and replicate the phased approach to demonstration of SBESs. Proposed targets for Phase 3a-3b of SBES demonstration include at least an additional 800 households adopting low-cost SBES and at least 60 additional households with installed biogas digesters. The decision to focus on introduction of SBES to new communities and CDCs, as opposed to increasing the penetration of SBES in already-participating communities, can be determined based on internal reviews and adaptive management during the implementation period.

Output 3.4 Specialised training conducted for at least fifteen (15) local engineers, skilled workers and entrepreneurs on the design, construction and marketing of piloted SBES in each of two pilot provinces in Afghanistan.

In participation with representatives of CDCs and DDAs, identify skilled artisans and entrepreneurs to be engaged in training activities related to manufacturing and promoting piloted SBES. In particular, individuals to be targeted for training include tinsmiths, bricklayers, masons and plumbers.

Based on the approaches applied in USAID ILGNRM project and UNEP Koh-e-baba project, engage at least five (5) tinsmiths in each project area to undertake the construction of FECs and IBSs to be distributed under Output 3.1, including at least two (2) training sessions to explain the benefits and advantages of SBESs.

Based on the approaches applied in BORDA's Afghanistan programme, engage and train at least five (5) masons and bricklayers in each pilot district to undertake construction of biogas digesters.

Output 3.5 At least fifteen (15) representatives of provincial planning and governmental agencies trained on planning, promotion and implementation of sustainable biomass energy projects, in each of two pilot provinces in Afghanistan.

Develop Module 2 of the updated training toolkit for governmental extension officers on integrated CBNRM and SFM principles, focusing on promotion of Sustainable Biomass Energy Systems (SBES). Training toolkits will focus on increasing capacity of provincial extension officers to plan, promote and integrate SBES into sectoral and development planning. Training toolkits produced in support of this component will include a focus on *inter alia*: i) supporting communities to identify and address

urgent household energy needs and challenges; ii) training communities to select, operate and maintain appropriate sustainable approaches and technologies for biomass energy use; iii) inclusion of SBESs and improved management of biomass resources within community- and district-level priority plans; and iv) increasing awareness and knowledge of communities of the benefits and potential approaches to sustainable biomass energy use, including through adoption of SBESs.

Train at least five (5) national staff through a 'training of the trainers' course conducted by BORDA Afghanistan, including participation in international training programmes at Chinese Academy of Sciences (CAS).

Train at least five (5) national staff from within NEPA's Climate Change departments – particularly with an emphasis on those technical staff who have benefitted from capacity development under UNEP's LDCF-funded BERA programme – on the benefits and importance of SBES and CBNRM as an approach to climate change mitigation.

Design and implement a continuous training programme for governmental extension officers based on training toolkit established in Activity 2.1.2. The training programme and training toolkit will be reviewed and updated systematically according to successful approaches and activities identified during the project implementation period.

Component 4: Awareness raising and monitoring and evaluation.

The objective of Component 4 is to ensure that lessons learned and best practices from the GEF project are broadly disseminated to help promote and raise awareness of CBNRM and SBESs in Afghanistan, that the project is well monitored, as well as that appropriate external evaluations are conducted. Funds under this component will mainly be used to undertake: i) the monitoring and evaluation of the project progress for adaptive management to respond to arising risks and unpredictable changes; ii) the dissemination of information and best practices through knowledge management platforms, national and international cooperation and awareness raising.

Under this component, project demonstration site visits will be organised and the project experiences will be disseminated to various interested stakeholders in order to increase the replication potential of the project. Multiple dissemination tools such as leaflets, radio, community forums, and websites will be used for effective dissemination. An annual report and periodical newsletter on best practices, information on country level projects and key indicators of progress made under the project prepared and distributed to key stakeholders and agencies.

An independent final evaluation will be conducted three months prior to the end of the project. The final evaluation will look at the impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefit goals. The final evaluation will also provide recommendations to the follow-up activities. After completion of the project, the project performance monitoring will be conducted to study the technical, financial, environmental and socio-economic performance of the projects.

Outcome 4 Increased national awareness and promotion of SBES and CBNRM .

In the baseline, there is generally a low level of awareness and low rate of adoption of the approaches and activities promoted by the project, particularly with respect to: i) concepts such as CBNRM, sustainable forest management (SFM and PFM; and ii) practices and technologies for efficient use of biomass energy. At a national level, there are existing policies and strategies that promote the project's approaches and as a result there is some existing awareness of these concepts within national government staff, however the practical implementation of these policies is fragmented and isolated mainly to donor-driven initiatives. At a local level, the traditional approaches to use of biomass and natural resources use are well-established and there is very little awareness of the benefits and potential approaches to enhancing these traditional practices.

Under Outcome 4 of Component 4, GEF resources will be used to collate and disseminate awareness-raising materials targeted at national-level decision-makers, sub-national technical government staff and the general public. These knowledge products will be generated over the course of the project implementation period and will include results and best practices emerging from field-

based activities within Components 2 and 3, and will be publicly accessible via the information system hosted through the CTCN within Component 1.

In particular, this outcome will focus on extraction and synthesis of results and lessons learnt, identification of best practices for wider sharing and dissemination, and cooperation between existing initiatives and knowledge hubs. This outcome of the project will also include benefit from technical inputs and knowledge-sharing with other existing initiatives and knowledge centres, notably the information generated through initiatives such as the BCA and hosted by platforms such as the CTCN. This outcome will be supported by: i) synthesis of lessons learnt and generation of best practices; ii) application of research results and best practices of previous projects; iii) integration of the project into knowledge exchange platforms; and iv) an environmental education and awareness raising strategy.

Outcome 4 will also emphasise systematic data collection from the field to effectively monitor and evaluate project progress indicators, monitor risk mitigation measures and design new measures to face unexpected risks, and to extract lessons learned (including successes and failures) that might be useful for future GEF initiatives. Financing under this component will address: i) the design and operation of the project's M&E system based on results-based management; ii) mid-term and final project evaluations, including defining response strategies to recommendations provided by these evaluations and, if necessary, adjustment of project implementation arrangements.

Outcome 4 will be achieved through the following outputs and indicative activities:

- 4.1 Awareness raising and communication strategy designed, developed, and delivered in pilot sites and at national level.
- 4.2 Project-related "Best Practices" and "Lessons Learned" published.
- 4.3 Project monitoring system operating providing systematic information on progress in meeting project outcome and output targets.
- 4.4 Final evaluation conducted.

2.4 GLOBAL ENVIRONMENTAL BENEFITS

(Note: the methods used for quantifying global environmental benefits are detailed extensively in Appendix 8, 9 & 10, particularly the latter).

The project will lead to direct reduction of GHG emissions from project sites in Dara-e-Noor district in Nangerhar and Salang district in Parwan as a result of:

- Avoided emissions from deforestation and degradation through the adoption of improved NRM and SFM practices;
- Increased sequestration of carbon in plant biomass and soil as a result of sustained implementation of CBNRM plans beyond the period of project implementation; and
- Reduced and avoided GHG emissions from domestic use of biomass fuels, through the adoption of sustainable biomass energy systems such as efficient stoves and anaerobic biogas digesters by at least ~1,920 households.

The project will aim to introduce sustainable practices for natural resource management to the project areas across a total spatial area of at least 24,000 ha (~12,000 ha in each of the two project districts). The project will target communities in two separate intervention areas, aiming to include at least 20 Community Development Councils in training and awareness-raising activities in each of the two project areas, representing an estimated population of ~30,000 people in each of the two project areas. Further direct benefits of the project, aside from GHG emission reductions, will include:

- increased livelihood opportunities based on increased availability of valuable natural resources through improved management under CBNRM plans;
- increased income for at least 15 local tinsmith artisans, masons and builders who will be contracted and trained to manufacture and market SBES; and
- increased capacity for at least 45 provincial- and district-level extension staff in the two pilot areas, through targeted training programmes and workshops.

Additional indirect benefits of the projects activities that will not be monitored over the project implementation period include *inter alia*:

- enhanced conservation of threatened fauna and floral biodiversity in two distinct ecosystem types, including the Eastern Forest Complex and Central Highlands steppe woodlands;
- increased provision of beneficial ecosystem services through adoption of improved NRM practices, such as reduced incidence of erosion, landslides and flooding;
- reduced fuel collection time and/or expenditure through improved efficiency of biomass energy use (further detail below); and
- improved health, particularly for women and children, through reduced exposure to indoor pollution (further detail below).

The total GHG reduction potential of the project is summarised in Table 11, below. The estimated emission reductions during the three year project implementation period are estimated to be ~37,491 tonnes CO₂e per annum. Over a 20 year period, the project's activities will contribute to a **total reduction of GHG emissions of ~838,267 tonnes CO₂e**. The majority of the GHG emission reductions and sequestration through forest and rangeland management and rehabilitation interventions will occur after the completion of the project implementation period. Therefore, the project's activities are designed to establish a base of skills, experience and guidelines to support sustained future investments in successful approaches identified by the project. By establishing this enabling environment, the project will facilitate a gradual long-term decrease in emissions of GHG, because of reduced deforestation and degradation in community-managed forests and rangelands.

Table 12. Total estimated reduction of GHG emissions as a result of project activities.

		Baseline emissions (tCO ₂ e/yr)	Project avoided emissions (AE) in tCO ₂ e			
			Avoided annual emissions	AE over project lifetime (3 years)	AE over yrs 4-20	Total AE from project sites
Dara-e-Noor	Emissions from land use change (12,000 ha)	5,786	-5,786	-17,358	-115,722	-133,080
	Emissions from household use of biomass fuel (20000 households)	8,986	-1,716	-5,149	-23,468	-28,617
			Project sequestration in tCO ₂ e			
			Additional annual sequestration	Additional sequestration over project lifetime	Additional sequestration over years 4-20	Total AE from project sites
	Carbon sequestration (12,000 ha)		-1,4792	-44,376	-251,468	-295,844
	Subtotal	14,772	-22,294	-66,883	-390,658	-457,541
Salang		Baseline emissions (tCO ₂ e/ yr)	Project avoided emissions (AE) in tCO ₂ e			
			Avoided annual emissions	AE over project lifetime (3 years)	AE over yrs 4-20	Total AE from project sites
	Emissions from land use change (12,000 ha)	2,477	-2,477	-7,433	-49,530	-56,963
	Emissions from household use of biomass fuel (20000 households)	315,911	-1,716	-5,149	-87,529	-92,677
			Project sequestration in tCO ₂ e			
			Additional annual sequestration	Additional sequestration over project lifetime	Additional sequestration over years 4-20	Total Sequestration from project sites
	Carbon sequestration (12,000 ha)		-11,004	-33,012	-187,070	-231,086
	Subtotal	318,388	-15,197	-45,594	-324,129	-380,726
	Total emissions	333,160	-37,491	-112,476	-714,787	-838,267

National and household benefits

The specific targets of the GEF project interventions are the communities of Salang District, Parwan and Dara-e-Noor, Nangahar. These populations are generally poor and particularly vulnerable to the effects of climate change. The GEF project aims to implement CBNRM plans to reduce local-level land degradation and deforestation across a spatial extent of at least 12,000 ha in each of the two project districts. The establishment of community forests and promotion of alternative livelihood schemes will reduce pressure on natural resources. In this way the project outcomes will increase community resilience through increasing the resilience of natural resources to extreme weather events and long term climate change patterns. Long term sustainable resource management will enhance the availability of other natural resources such as water, while reforestation through the establishment of community forests will provide the opportunity for livelihood diversification. Opportunities will be created through the sustainable use of natural provision of NTFPs, including honey, resin, mushrooms and medicinal plants, and through value-added processing, such as the production of furniture and crafts.

Project interventions will lead to a reduction in the amount of time spent gathering fuel within the target populations, by providing more efficient household use of energy (including through promoting of SBESs). This will provide communities with the opportunity to undertake alternative livelihood practices. Community members can then dedicate time to learning, whether by simply being able to spend more time in school or acquire additional skills directly applicable to CBNRM. Household expenditure on purchasing fuel inputs such as firewood, charcoal and oil-based fuels will be significantly reduced as a result of the improved efficiency of fuel use. Average annual household expenditure on these fuel sources is estimated to range from ~USD 750 – 1,800 per annum, which could be reduced by approximately half through adoption of SBESs (elaborated further in Appendix 9).

Furthermore, clinical studies have demonstrated the direct health benefits gained from a shift from open fires to improved stoves and biogas, through a reduction in carbon monoxide inhalation and associated respiratory illnesses¹. A simple shift in home cooking and heating practices can therefore provide the dual role of improving health and reducing the workload associated with fulfilling family fuel requirements. The project will distribute a minimum of 1800 stoves and 120 biogas digesters, thereby improving the health of at least 1920 households (~14,000 people) across the project implementation sites. As stated previously, providing community members with training on producing, repairing and selling fuel-efficient stoves and biogas digesters will support further upscaling of appropriate technologies, thereby leading to improved health beyond the project's implementation period and sites.

A further benefit of using SBESs will result from the reduced reliance on animal dung for energy requirements. This will lead to an increased availability of manure for fertiliser, enhancing potential agricultural yields within project areas. Furthermore, the empowerment of local community members to manufacture SBESs will allow some community members to supplement their income, thereby reducing dependence on subsistence farming.

The GEF project, in line with the National Action Plan for the Women of Afghanistan, as well as United Nations Development Assistance Framework and GEF guidance, will engage women in the planning and implementation of both local- and national-level project activities. In particular, as the primary end-users of SBESs, the input of women into the design of project activities is particularly relevant. Furthermore, women are likely to be responsible for the operation and maintenance of biogas digesters. Therefore, wherever possible the project will prioritise the participation of women in activities which are culturally appropriate. NEPA and other relevant government agencies (MAIL,

¹ Clark, M.L., Peel, J.L., Burch, J.B., et al. (2009) Impact of improved cookstoves on indoor air pollution and adverse health effects among Honduran women. *International Journal of Environmental Health Research* 19, 5 (2009), 357–368 [Online] DOI: 10.1080/09603120902842705

MEW and MRRD) have already committed to working to increase the participation of women in natural resource management and governance, and the GEF project will facilitate this process through its capacity-building activities. The District Development Authorities are represented by both male and female members (~30% female) and as a result the project will emphasise close engagement with DDAs as a mechanism to support the inclusion and representation of women in the project's activities.

2.5 COST EFFECTIVENESS

The GEF project's interventions have been designed to be as cost-effective as possible and to achieve sustainable results by leveraging substantial baseline investments from both the forestry and rural development sectors. The strong focus on implementing field-based activities through participating communities will allow the project to benefit from labour contributions from communities, in alignment with the approach of the NSP and NABDP. Additionally, the leading role that communities will play in the selection of activities to be implemented will support local 'buy-in' and therefore improve the sustainability of the project.

Several alternative designs and approaches were considered for cost-effectiveness during project design, particularly with respect to potential approaches that could be applied to forest/natural resource management interventions and the choice of specific SBESs to be promoted. The project's approach of mitigating GHG emissions – namely through conservation and improved management of forest resources and increasing the efficiency of biomass fuel use – can be considered to be “no-regrets” investments which will generate multiple co-benefits at the project demonstration sites. Emissions from the LULUCF sector account for the majority of Afghanistan's GHG emissions. Other major sources of GHG emissions include electricity generation based on fossil fuels and the transport sector. Alternative approaches to reducing GHG emissions which could be considered in Afghanistan include: i) promotion of renewable energy technologies such as off-grid solar PV and micro-hydro power; ii) increased efficiency of electricity generation and usage; and iii) substitution of fuels used in the transport sector.

Previous studies have emphasised the importance of sustainable forest management, forest conservation and afforestation as cost-effective approaches for mitigating against climate change, although noting the variability in costs and total mitigation potential between different project instances. A meta-analysis undertaken by Valatin and Price (2013)¹ found that cost-effectiveness of GHG mitigation through forest management could range from ~\$2 - \$150/tCO₂e. By contrast, the promotion of household-scale (i.e. off-grid) solar PV systems was found to be comparatively less cost-effective, with estimated costs ranging from ~\$100 - \$576/tCO₂e (assuming a lifespan of 40 years).

A second meta-study provides comparison between multiple mitigation strategies available to policy-makers and assessed the relative cost-effectiveness of the various approaches². The latter study estimated the cost-effectiveness of afforestation/reforestation activities to be ~\$20/tCO₂e. Of the forms of renewable energy assessed, biomass-based energy systems such as anaerobic biogas digestion was estimated to be ~\$40/tCO₂e. Wind, solar thermal and micro-hydro were found to be increasingly expensive per unit of CO₂e at ~\$80, \$90 and \$100/tCO₂e. Consequently, the promotion of efficient biomass use of biomass energy and promotion of carbon sequestration in the LULUCF sector has been demonstrated to be particularly cost-effective in several different contexts, although both meta-studies also note that the total global potential of the more expensive renewable energy technologies is considerably greater.

¹ Valatin, G. Price, C. (2013). How cost-effective is forestry for climate change mitigation? Centre for Ecosystems, Society and Biosecurity, Forest Research, Scotland. [http://www.forestry.gov.uk/pdf/Bookchapter-Cost_effectiveness_of_forestry.pdf/\\$FILE/Bookchapter-Cost_effectiveness_of_forestry.pdf](http://www.forestry.gov.uk/pdf/Bookchapter-Cost_effectiveness_of_forestry.pdf/$FILE/Bookchapter-Cost_effectiveness_of_forestry.pdf)

² Sweeney, J. A Cost-effectiveness Analysis of AB 32 Measures. Undated presentation. Precourt Institute for Energy Efficiency, Stanford University.

Several design features of the project's activities have been specifically included to increase cost-effectiveness and sustainability of the project's investments. The GEF project's forestry interventions will focus primarily on restoration and regeneration through sustainable management practices, rather than reforestation through replanting. The former is considerably cheaper, as it does not necessitate nurseries, irrigation or intensive site-preparation and is reliance on transferring skills and practices to the communities responsible for forest management. Furthermore the approach of promoting recovery of existing forest stocks will result in immediate results whereas the approach of reforestation/enrichment planting necessitates some delays in producing, planting and establishing seedlings. However, although the primary focus of the project's field-based activities will be on natural forests and woodlands, there is still potential to promote the establishment of woodlots to provide supplementary woodfuel at selected sites. This approach is considerably cheaper than reforestation/afforestation, for several reasons including: i) reduced spacing of woodlots, relative to plantations and natural forests, reduces the opportunity cost of using land; ii) the costs of establishment are lower because there is no need to transport and transplant seedlings to plantation sites, and seedlings can be raised and managed close to the homestead; and iii) no extensive protection measures are needed.

The inclusion of communities in the monitoring and inventories of forest areas under Component 2 is considered to be a particularly cost-effective approach to assessing the impacts of the project's interventions. Previous assessments of community-based forestry stocktaking and monitoring has proven to be at least as accurate as that undertaken by professional service providers¹, and is considerably more cost-effective. The GEF project will make use of this method to account for biomass gains in community forests. The method is easily taught to people with between 4 – 7 years of primary school education. Steps include boundary mapping, identifying forest strata, pilot survey of estimating variance, laying out and recording the location of permanent plots, and measuring the biomass within each.

The GEF project's interventions primarily focus on management practices. Therefore, procurement will not be a major cost component. Those materials which are required, primarily for construction of SBESs, will be sourced from local suppliers to reduce costs while contributing to the development of local economies. The project will dedicate resources to training local artisans to ensure that workmanship is of good quality. Under Component 3, household bio-digesters will be fabricated *in situ* (on-site) by local artisans, rather than transporting prefabricated units from Kabul to target communities, which reduces the cost of this intervention by ~50%. Also under this component, FECs will be produced by local artisans from local materials at a cost of less than ~US\$50 per unit. The project will disburse SBESs at a partially subsidised rate, which will support a cost-effective balance between incentivising adoption of subsidised technology while encouraging communities to make their own cash contributions, thereby supporting 'buy in'. By buying the product, a household is incentivised to make full use of the investment. In comparison, when an item is gifted its value may not be appreciated and the motivation to learn how to use it can be lacking.

The project's proposed approach to procurement of technical skills and service providers will focus on the involvement of well-capacitated and experienced NGOs to act as technical service providers. This approach will minimise the costs allocated to international consultancy fees and travel by prioritising national expertise where available. Notwithstanding, where international expertise is unique or exceptionally credible, it will be utilised. Only where the difference in cost is determined to be justified by the increase in value of knowledge, or the requisite skill is not available within Afghanistan, will the international expert be sought. This approach will rely strongly on soliciting the participation of NGOs such as BORDA and MADERA who have the benefit of experienced international and local staff, established presence and familiarity to local communities, and extensive stakeholder contacts.

¹ Skutsch, M.M., van Laake, P.E., Zahabu, E.M., Karky, B.S and Phartiyal, P., 2009, Realising REDD+ - National strategy and policy options, Chapter 8: Community Monitoring in REDD+, pp. 103 – 105, ed: Angelsen, A, CIFOR

Another cost-effective design feature is the selection of pilot districts that are relatively accessible and have existing infrastructure to support implementation. The provincial coordination units will be hosted at government facilities, thereby reducing the costs for establishing and renting office space. The FAO has an existing presence, infrastructure and capacity in Nangerhar with a field office in Jalalabad, in addition to their ongoing dairy project in Parwan. Both pilot regions are relatively accessible from Kabul by car (both districts) and by plane (Jalalabad).

2.6 INNOVATIVENESS

The integrated approach to generating benefits in the forestry, renewable energy and rural development sectors is a new and innovative approach in Afghanistan. This cross-sectoral approach will be underpinned by policy and institutional reforms that integrate carbon emission reductions and sequestration targets into integrated land-use, forestry and renewable energy plans at national, provincial and local levels. Additionally, this approach will be compatible with other alternative energy systems, such as parabolic and photovoltaic solar systems, and micro-hydro systems and can therefore be applied in multiple local contexts. The integration of approaches for reducing net fuel demand under Component 3 with increased forest productivity under Component 2 will result in combined benefits for local communities, forest/woodland areas and net emission of GHGs.

The GEF project will also use on-the-ground CBNRM approaches that have not previously been widely applied in Afghanistan, such as community-based resource stocktaking and monitoring. The approach to CBNRM will be based on the approach first piloted under FAO's PFM project (2009-2011), which was identified as an appropriate initiative to be replicated and upscaled in the future. By maintaining a strong emphasis on training and management practices, the project will promote adaptive learning and application of knowledge acquired through research and practice. In particular, the training activities will focus on concepts related to productivity and integrity of natural resources so that beneficiary communities have the knowledge and capacity to utilize natural resources sustainably by balancing resource extraction with regeneration.

The project will demonstrate SBES types that have previously been piloted in Afghanistan. However, GEF resources will be used to support further technical studies and improvement in design of SBESs, in order to develop SBES approaches that are specifically tailored to local users needs, based both on the findings of previous projects as well as research and user feedback collected during the implementation phase. Training in the design and manufacture of stoves will also include lessons on how to look for further improvements or customizations that can be made to FECSs as well as refinements in the tools and production methods.

Afghanistan's recent history of development assistance has resulted in extensive locally available experience in CBNRM, SBESs and similar fields. The institutional knowledge contained within these agencies has been incorporated into the design of the GEF project, but opportunities to improve and lessons learned from less-successful projects have also been factored in. Continual evaluation of project interventions will also allow the GEF project to refine its approaches throughout project implementation.

The use of local NGOs as technical service providers is an innovative alternative to procuring international consultants, which is an expensive and time-consuming process. Rather, the reliance on locally experienced NGOs will strengthen linkages with local stakeholders and ongoing projects and reduce costs while contributing to local capacity development.

SECTION 3 – FEASIBILITY (FUNDAMENTAL DIMENSIONS FOR HIGH QUALITY DELIVERY)

3.1 ENVIRONMENTAL IMPACT ASSESSMENT

The proposed project is classified as a ‘Category C’ project. The project is not expected to result in any negative environmental or social impacts. The project will test methodologies and technologies that will help prevent deforestation, improve air quality and reduce the emission of greenhouse gases. The project activities will not result in any major changes to the landscape and will not prevent local communities from pursuing traditional ways of life, for example with respect to traditional practices for natural resource management.

Environmental and social considerations have been taken into consideration in the detailed design of the project and the risk analysis in Section 3.2. In accordance with FAOs governing principles¹, the consideration and implementation of the Voluntary Guidelines on Planted Forests² within the project will be a functional equivalent of an Environmental Impact Assessment (EIA). In particular, the project will observe guidelines under the three identified environmental principles: Principle 9 – Maintenance and conservation of environmental services; Principle 10 – Conservation of biological diversity; and Principle 11 – Maintenance of forest health and productivity.

Under Principle 9, the following guidelines will be incorporated into the project:

- formulating policy and planning framework so as to encourage maintenance, conservation of environmental functions;
- adopting integrated watershed management approaches and the protection of soil from erosion (through alignment with UNEP and other projects);
- considering carbon sequestration and the provision of carbon sinks in the planning, management, utilisation and monitoring of planted species;
- applying sound operational standards and field practices, including contractor arrangements, in the establishment, management, harvesting and utilisation of planted forests in order to minimise negative environmental impacts; and
- recognising the positive impact that planted forests can have on the provision of environmental services, including rehabilitation of degraded lands, restoration of landscapes, reclamation of site and combating of desertification.

Under Principle 10, the following guidelines will be incorporated into the project:

- adapting management practices to help maintain and enhance the diversity of plants and animals and conserve genetic resources;
- recognising the role that planted forests (such as woodlots) can play in relieving pressures on naturally regenerating forests and in providing habitats for indigenous flora and fauna;
- preparing baseline studies to monitor the impact of planted forest management and CBNRM on the maintenance of plants and animals and the conservation of genetic resources;
- avoiding the conversion of naturally regenerating forests or ecosystems of significant conservation value into planted forests;
- controlling illegal practices such as hunting or the removal of animals, as well as foraging and harvesting plants;
- selecting indigenous species for the establishment of planted forests, if they are equal to or better than introduced species for the purpose intended; and
- evaluating the risk that introduced species may become invasive and have adverse effects on local biodiversity.

Under Principle 11, the following guidelines will be incorporated into the project:

¹ As set out in the Environmental impact assessment: Guidelines for FAO field projects (2012)

² Available at: <ftp://ftp.fao.org/docrep/fao/009/j9256e/j9256e00.pdf>. Accessed on 03 December 2014.

- recognising the high productivity of intensively managed forests in terms of forest products and services;
- promoting reforestation, soil conservation and other measures after harvesting forests;
- applying sound biosecurity measures (prediction, prevention, monitoring, rapid response to outbreaks and restoration) to reduce the incidence and impact of invasive species by controlling encroachment in degraded areas;
- managing the use of herbicides, pesticides, fungicides and other chemicals responsibly, in accordance with legal requirements and best-practice standards;
- selecting species and reproductive materials with the end-use/product objective, site conditions, environmental impact, genetic diversity and risk of invasiveness in mind;
- avoiding the use of planned fire in land clearing and preparation where science indicates conditions that could be adversely affected by fire;
- undertaking site-establishment practices that maintain or enhance productivity potential and forest health, while minimising environmental impact;
- supporting education, training, scientific research and networking in forest protection, forest health and sustainability of site and crop productivity;
- adopting silvicultural management and monitoring practices that balance the trade-offs between maintaining the health and productivity of planted forests and reducing environmental risks, including those from neighbouring land uses.

In addition to conforming to guidelines set out in the environmental cluster, the project is also aligned with a number of guiding principles under the institutional, economic, social clusters. These include: i) good governance; ii) integrated decision-making and multi-stakeholder approaches; iii) effective organisational capacity; iv) recognition of the value of goods and services; v) recognition of the role of the market; vi) recognition of social and cultural values; vii) maintenance of social and cultural services; and viii) management of landscapes for social, economic and environmental benefits. Through aligning itself with these guiding principles, the project will ensure that all social and environmental risks are considered, and appropriate mitigation measures are integrated into the project's design.

Certification

Project Category C	Yes	No
I affirm that I have performed an environmental review of this project and certify that the project conforms to the pre-approved list of projects excluded from environmental assessment and that the project will have minimal or no adverse environmental or social impacts. No further analysis is required.	X	

Title, name and signature of project leader: _____

3.2 RISK MANAGEMENT

Project risks have been identified and analysed during the full project preparation and mitigation measures have been incorporated in the project design. With the support from and under the supervision of FAO, the National Project Implementation Unit will be responsible for the day-to-day management of these risks and the effective implementation of mitigation measures. The NPIU will also be responsible for monitoring the effectiveness of mitigation measures and adjusting mitigation strategies as needed and identify and manage any eventual new risks not foreseen during project development in dialogue with FAO and other concerned project partners.

The six-monthly Project Progress Report (see section 4.5.3) is the main tool for project risk monitoring and management. The reports include a section on systematic following-up on identified risks and mitigation actions in previous reporting periods as well as another section for identification of eventual new risks or risks that still needs attention, their rating and mitigation actions including by whom and by when they should be completed. FAO will monitor the project risk management closely and follow up if needed, providing support for the adjustment and implementation of risk mitigation strategies. Reporting on risk monitoring and rating will also be part of the annual Project Implementation Review prepared by FAO and submitted to the GEF Secretariat (see section 4.5.3).

3.2.1 Risks and mitigation measures

Risks identified during the preparation of the PIF for the achievement of the project objectives and results have been further analysed and additional risks have been identified and analysed as part of the project risk assessment, undertaken during the design of the project. Mitigation measures have, in each case, been developed and incorporated into the full project design. Appendix 4 summarizes all risks identified, their rating, and mitigation measures incorporated in the design of project components.

The approach to implementing project activities will be explicitly focused on establishing sustainable practices for the management of forest and natural resource use, including the establishment of allowable harvesting rates of commercially valuable products. The establishment of CBNRM plans will focus on enhanced protection and restoration of existing natural forests rather than reforestation/afforestation of degraded areas, and as a result the primary focus of CBNRM will be on the restoration of indigenous plant species and biodiversity. Consequently, the project is aligned with the FAOs governing principles¹, in that it will enhance biodiversity and ecosystem functionality. However, the activities related to CBNRM will be selected by participating communities and could also include complementary activities such as establishment of woodlots and enrichment planting of degraded areas, and as a result it may be the preference of communities to include non-indigenous species that generate commercially valuable products. In the latter scenario, the project will promote the use of non-invasive species, and will be complemented by awareness-raising and training activities that will emphasise the importance of maintaining indigenous biodiversity. Guidance and advice from local botanical, ecology and forestry specialists will be integral to the development of the project's activities and will ensure that interventions are environmentally appropriate, socially beneficial and economically viable.

A strong emphasis will be applied to establishing sustainable harvesting practices within target communities. The project's dual aspects of limiting the demand for biomass while increasing supply is directed at minimising negative environmental impacts and maximising beneficial practices. To ensure this takes place, training on the sustainable harvesting of natural resources will be emphasised. This will include training on: a) preferred species; b) seasonal harvesting on particular species; c) harvest techniques to promote regrowth e.g. coppicing, selective pruning, collection of deadwood; d) ensuring adequate availability of seedlings and seedstock to allow for regeneration of harvested areas; e) establishing systems for rotational harvesting and grazing to support recovery of harvested areas; f) limits to harvesting on single specimen; and g) impacts of harvesting deadwood. Guidelines of grazing, browsing and rangeland management will also be included as part of this training.

The activities supported by GEF funds will be aligned with the Environmental Law and Forest Law and will ensure that participating communities are actively engaged in the selection and implementation of activities that are aligned with the laws and traditional practices of CDCs and district councils.

¹ As set out in the Environmental impact assessment: Guidelines for FAO field projects (2012)

Table 13. Identified risks and mitigation measures

Identified Risk	Impact	Likelihood	Mitigation Measures
Potential conflict and increased internal security risks	High	High	<p>The identified pilot districts are considered to be relatively secure at present, and have had a low incidence of conflict over the last ten years. Furthermore, a full security analysis will be undertaken before sites are finalised during the implementation phase. Preference will be given to secure and stable intervention sites with a good working relationship with the project-executing agency or sub-contracted NGOs, aligned with the site selection criteria proposed during the inception workshop.</p> <p>Project will operate under United Nations minimum operational security standards (MOSS).</p> <p>Strong participatory stakeholder consultation will be undertaken to ensure reasonable project expectations, clarify roles and responsibilities and to ensure local buy-in.</p> <p>Continual engagement with local political structures (<i>shuras</i>, CDCs and community leaders) will enhance legitimacy and community ownership.</p> <p>The project's approach to field-based activities will prioritise the employment of national consultants and staff and will be implemented with the assistance of NGOs who are well-respected and familiar to local communities.</p>
Availability of sufficiently competent local technical expertise	High	High	<p>An experienced project coordinator will be selected to ensure that government staff are motivated and have adequate access to technical support and training.</p> <p>To complement and strengthen national capacities, working relationships with International Agencies and NGOs with 'on-the-ground' capacity such as UNEP, MADERA and BORDA will be prioritised. These agencies have a strong emphasis on appointment of national staff and have well-established relationships with government staff. Consequently, close engagement with the aforementioned agencies will ensure that the project's activities are focused on building on existing capacity and provides a means of introduction to particularly experienced or skilled individuals.</p>

			<p>Both FAO and UNEP have years of operational experience in challenging circumstances in Afghanistan.</p> <p>Project activities will strongly emphasise capacity-building, awareness-raising and the development of dedicated training tools, tailored to the individual needs of government staff, community members and independent bioenergy experts. This will include a process of ‘training of trainers’ to ensure a constant focus on transfer of knowledge and technical skills.</p>
Inadequate national and institutional priority given to climate change mitigation measures because of limited knowledge	Medium	Medium	<p>Awareness and technical capacity relating to climate change mitigation is relatively low within government. However, several ongoing initiatives are focused on increasing institutional capacity and awareness of climate change, for example through UNEP’s Building Environmental Resilience in Afghanistan (BERA) programme and LDCF1 and LDCF2 projects. NEPA is the institution mandated with coordinating GoIRA’s climate change response while MAIL is the UNFCCC focal point, consequently the project will be imbedded in the government institutions with the most direct relevance to climate change.</p> <p>The project’s activities will include a focus on establishing data, information and policy briefs to inform GoIRA’s response to climate change, particularly with respect to monitoring and reporting on GHG emissions.</p>
Climate change-induced extreme weather and associated phenomena (droughts, floods and sandstorms) or extreme climatic variations / natural hazards may reduce effectiveness of project interventions or damage infrastructure.	Medium	Medium	<p>Project interventions will be designed to reduce the potential impacts of climate change and to increase the resilience of local communities to climate impacts through the provision of locally available resources and ecosystem services.</p> <p>MADERA baseline programme has experience and expertise in activities such as improved thermal insulation and passive solar heating of households, therefore communities will benefit from additional information and training on multiples methods of increasing efficiency of household heating.</p> <p>The project will also build upon baseline and related initiatives that are focused on</p>

			reducing the vulnerability of communities, therefore the project's activities will be strengthened by the investments of previous initiatives.
Limited government engagement	High	Low	<p>The GoIRA, under NEPA, MAIL and the MRRD, has already expressed its commitment to the project.</p> <p>The project addresses specific priorities identified by the GoIRA (see Section 1.1.5), and has been developed in close participation with project partners, including MAIL, MRRD, NEPA, MEW, BORDA, MADERA, Kabul University, and local DDAs, CDCs and FMCs.</p> <p>Continuous stakeholder engagement through the project lifetime and capacity building within NEPA, MAIL, MEW and the MRRD at national, provincial and district level will sustain national support and enhance the capacity for project implementation within the relevant agencies.</p>
Livelihood dependence of communities in pilot projects may undermine the project's efforts to promote sustainable NRM.	Medium	Medium	<p>A community-based management approach combining natural resource management and integrated energy planning will be undertaken to ensure that project activities directly address community desires and needs in an integrated approach.</p> <p>Project activities will be designed to enhance livelihoods and reduce the dependence of local communities on natural resources, allowing for their use to be sustainable.</p> <p>To reduce the extractive pressure on forests and natural resources by local community members, the project will promote and distribute at least two SBESs that will reduce use of non-renewable biomass energies. Specifically, the project will promote both: i) low-cost energy-efficient woodfuel cookstoves and <i>bukhari</i> heaters, that will reduce the rate of woodfuel use; and ii) household-scale biogas digesters, which will displace unsustainable woodfuel use by promoting livestock waste as an alternative biomass fuel.</p>
Limited sustainability and upscaling of project outcomes after project completion	Medium	Medium	Project activities include empowerment of private sector to undertake design, construction and marketing of SBESs, which will increase the long-term sustainability of the project's interventions

			<p>impacts. Although there will be inherent risk of failure in private sector ventures, successful outcomes will expand and increase their market share.</p> <p>Furthermore, the selection of activities and specific species to be managed within CBNRM plans will prioritise commercially valuable forest products and livelihood-generating activities such as nursery establishment, thereby creating new revenue streams for community members.</p> <p>Strong stakeholder ownership will be promoted through continual engagement, training and integration of project outcomes into national policymaking procedures.</p> <p>By laying the groundwork for Afghanistan to access further development funding through the CDM and REDD+ mechanisms, the project will facilitate significant long-term integration of CBNRM and SBES processes and approaches into national development strategies.</p>
Women may have limited efficacy over proposed interventions	Medium	Medium	<p>Site-selection criteria will include the presence of an active and motivated women's group or advisory committee, which will be engaged with throughout project design and implementation.</p> <p>CDCs are composed of at least 30% female representatives. Consequently the participation of women in the project's activities is assured. In practice the ease of including the participation of women in certain activities is likely to be variable between communities according to local dynamics.</p> <p>Training programmes will be based on specific activities which are appropriate for the inclusion of women, particularly those activities related to the operation of SBESs (which is traditionally the domain women).</p> <p>Gender disaggregated indicators will be developed and used for monitoring and evaluation.</p>

SECTION 4 – IMPLEMENTATION AND MANAGEMENT ARRANGEMENTS

4.1 INSTITUTIONAL ARRANGEMENTS

General institutional context and responsibilities

The implementation of the project will be dependent on the support and participation of multiple stakeholders, including representatives of three line ministries and the GEF focal point agency NEPA. Furthermore, at a local level the project will require the logistic and technical support of technical service providers to act as facilitating partners in participation with provincial departments of line ministries. Communities are represented by formal development committees and district-level development authorities established through the ongoing activities of MRRD. In addition to the important roles played by technical service providers and government representatives in providing support to local communities, the project will also rely on the involvement of academic institutions to lead the technical research on the performance and efficiency of SBESs demonstrated by the project. An organogram representing the roles of each stakeholder in the project's implementation plan can be found in Section 4.1 c). Table 14 (below) provides description of the roles and responsibilities of each stakeholder.

Table 14. Stakeholder involvement plan

Stakeholder	Roles and responsibilities
United Nations Food and Agricultural Organisation (FAO)	The FAO is the GEF implementing agency for the project. It will provide technical support for the project as a whole through its global expertise and in-country infrastructure. This oversight role includes the identification and recruitment of suitable expertise (particularly in-house expertise) to ensure that project activities can be suitably planned and executed. In addition, it will facilitate the monitoring and evaluation of the project outcomes, and will sit on steering and management committees to provide essential project support.
Ministry of Agriculture, Irrigation and Livestock (MAIL)	MAIL is the government institution responsible for strengthening Afghanistan's licit agricultural economy through increased production, efficient natural resource management and market development. MAIL has both a Natural Resource Management Department and a Forestry Department. MAIL also chairs the Agriculture and Rural Development cluster of the National Priority Programmes. Consequently MAIL will be the lead executing partner for the GEF project and will host the National Project Implementation Unit (NPIU) and Provincial Coordination Units (PCUs). The responsibilities of MAIL to execute the project will be overseen by an appointed National Project Director (NPD). MAIL is the agency best situated to undertake activities related to design and implementation of activities such as CBNRM and development of alternative rural livelihoods. Furthermore the technical capacity within MAIL will provide a foundation for the forest monitoring/inventory activities that will support the development of carbon markets. Consequently, the provincial directorates of MAIL will lead interventions under Component 2 in coordination with MRRD's implementation of interventions under Component 3. MAIL will also contribute to institutional strengthening activities under Component 1, and public awareness-raising activities under Component 4, where relevant. The representation of MAIL in the PSC and the Sustainable Biomass Energy Working Group (SBEWG) will be critical to support clear coordination of activities and responsibilities between project partners.

Stakeholder	Roles and responsibilities
National Environmental Protection Agency (NEPA)	<p>NEPA is Afghanistan's national GEF focal point. It currently chairs the inter-ministerial Committee for Environmental Coordination and the National Climate Change Committees, which are responsible for the coordination of inter-ministry responses to cross-cutting and multi-sectoral issues. NEPA has been identified as an Executing partner for this and other projects under multilateral environmental agreements (MEAs), and will therefore coordinate both the local and international stakeholders for the GEF project implementation as well as with other aligned initiatives.</p> <p>Consequently, NEPA will chair the PSC and will be represented in the National Project Implementation Unit (NPIU) and SBEWG. Furthermore, NEPA will support the implementation of field-based activities under Components 2 and 3 by MAIL and MRRD, respectively. Provincial NEPA staff will therefore be represented in the Provincial Coordination Units (PCUs) established in the pilot provinces. The participation of NEPA provincial staff will be particularly valued in activities related to NRM, community capacity-building and public education/awareness-raising.</p> <p>NEPA will also contribute to policy revision under Component 1, where relevant, and will support the awareness-raising activities under Component 4 through ongoing public outreach and awareness-raising activities.</p>

Stakeholder	Roles and responsibilities
Ministry of Rural Reconstruction and Development (MRRD)	<p>The MRRD is the government agency mandated with improving rural infrastructure, enhancing local planning and management capacity, and promoting rural livelihoods. It is currently undertaking the majority of the government's off-grid and local power generation activities, largely through the large-scale National Area-Based Development Programme (NABDP), and to a lesser extent through the National Solidarity Programme (NSP). The NSP has established community development committees (CDCs) throughout Afghanistan, and these are the ideal structures through which the GEF Project will interact with the communities. The establishment of such structures will facilitate the ease of CBNRM planning for community forestry and integrated energy plans within the pilot areas. Furthermore, the GEF Project will interact with the MRRD to build capacity for CBNRM, SBES and REDD+/CDM activities to improve Afghanistan's ability to promote low-carbon sustainable development.</p> <p>Consequently, the provincial directorates of MRRD will lead the implementation of field-based activities under Component 3 as well as providing support to MAIL's implementation of interventions under Component 2. Provincial MRRD representatives, in participation with provincial- and district-level government, will lead the identification and engagement of CDCs and District Development Authorities (DDAs) to participate in the project's activities. Further, the integration of the project's activities into ongoing district-level planning, including management and sustainable use of natural resources and biomass fuels, will be facilitated by MRRD through the mechanisms established by the NABDP and NSP.</p> <p>At a national level, the representation of MRRD in the NPIU, PSC and SBEWG will support clear coordination of roles and responsibilities between project participants. MRRD will be the agency responsible for executing the activities related to dissemination of SBESs within Component 3 in close participation with MEW, with an emphasis on coordinating workplans and priority activities of both ministries. Close coordination between MRRD and MEW will be necessary throughout the project implementation period to ensure that the activities of the project, for example the choice of which SBESs are promoted, are relevant and aligned with national development goals related to renewable and rural energy.</p> <p>MRRD and MEW will be expected to contribute equally to institutional-strengthening activities under Component 1, most importantly: i) integrating CBNRM and sustainable biomass energy into existing strategies and ongoing development plans; ii) identifying technologies and approaches to be promoted by the project; iii) establishment of roadmap for promotion of SBES and CBNRM at a national level beyond the project implementation period; and contribution of existing data, information, best practice guidelines etc. that have been generated by past projects.</p>

Stakeholder	Roles and responsibilities
Ministry of Energy and Water (MEW)	<p>MEW is the national department mandated with managing Afghanistan's energy needs and has overseen significant improvements in national electricity production. MEW is an essential partner for this project to facilitate mainstreaming of efficient alternative energy systems based on biomass.</p> <p>MEW will contribute to policy revisions under Component 1 and assist in identifying appropriate renewable energy technologies to be promoted and disseminated in Component 3 with the execution of MRRD. The representation of MEW in the NPIU, PSC and SBEWG will be critical for clear coordination of roles and responsibilities between project participants.</p> <p>Close coordination between MRRD and MEW will be necessary throughout the project implementation period to ensure that the activities of the project, for example the choice of which SBESs are promoted, are relevant and aligned with national development goals related to renewable and rural energy. MRRD and MEW will be expected to contribute equally to institutional-strengthening activities under Component 1, most importantly: i) integrating CBNRM and sustainable biomass energy into existing strategies and ongoing development plans; ii) identifying technologies and approaches to be promoted by the project; iii) establishment of roadmap for promotion of SBES and CBNRM at a national level beyond the project implementation period; and contribution of existing data, information, best practice guidelines etc. that have been generated by past projects.</p>
Bremen Overseas Research and Development Association (BORDA)	<p>BORDA is an international organisation concerned with poverty alleviation, sustainable protection of natural resources, and the strengthening of social structures. As part of its mandate to provide access to electricity in remote rural villages, BORDA has implemented a number of biogas initiatives in Bamyan Province. Furthermore, BORDA was instrumental in the establishment of Afghanistan's Biogas Consortium in October 2014. The Biogas Consortium is a partnership between organisations that wish to promote, contribute to, and learn about the sustainable development of biogas in Afghanistan.</p> <p>BORDA will be a field-implementing partner for the GEF project and will provide technical support and guidance for renewable energy interventions. Consequently, BORDA will be invited to join the Sustainable Biomass Energy Working Group (SBEWG) and the Project Steering Committee.</p>
Mission d'Aide au Développement des Economies Rurales en Afghanistan (MADERA)	<p>MADERA is an international organisation that has been promoting rural development in Afghanistan since 1988. MADERA – through the NSP – has supported 1267 CDCs implement community projects throughout Afghanistan and support for a further 435 CDCs is planned for 2015¹. As part of its 2014–2017 strategic plan, MADERA aims to collaborate with complimentary forestry and CBNRM projects to reintroduce its agroforestry initiatives and continue with CBNRM interventions that have been in abeyance since 2013.</p> <p>Consequently, MADERA will be a field-implementing partner for the GEF project, providing technical support and guidance for CBNRM and forestry interventions. Furthermore, MADERA will be invited to join the SBEWG and PSC.</p>

¹ MADERA Strategic Plan 2014–2017. Available at: <http://www.madera-asso.org/english/strategic-plan/strategic-plan-2014-2017-1/>. Accessed on : 09 December 2014.

Stakeholder	Roles and responsibilities
UN Environment Programme (UNEP)	<p>UNEP has been consulted during the initial stages of the project design, and is an essential partner for providing technical assistance. UNEP PCDMB has provided ongoing technical support to NEPA in the management of MEA obligations and implementation of GEF and other projects in Afghanistan. UNEP's local office is currently providing executing support to NEPA for two other GEF projects.</p> <p>Consequently, UNEP will be invited to contribute to the PSC and SBEWG to improve coordination and sharing of information and best practices between initiatives. In 2015 UNEP will operationalise the Climate Technology Centre and Network (CTCN) for Afghanistan which will host the biomass energy information system created by the project.</p>
Kabul University	<p>Kabul University, in particular the Kabul University Renewable Energy Lab (KURE Lab), will be leading the technical analyses and studies of SBES technologies to support monitoring and evaluation of emission reductions, as well as producing published academic studies. Kabul University and KURE will also be invited to join the Sustainable Biomass Energy Working Group (SBEWG) and the Project Steering Committee (PSC).</p> <p>These measures will support detailed carbon monitoring in future projects and will establish capacity and reference data for national GHG monitoring.</p>
District Development Assemblies (DDAs); Community Development Councils (CDCs); and Forest Management Committees (FMCs)	<p>Local communities will be engaged with early in the PPG process, to identify relevant project implementation sites. DDAs will be consulted to identify communities represented by suitable CDCs and FMCs for project interventions.</p> <p>Community consultation will continue throughout project implementation. The planning, design and management of project activities under Component 2, such as CBNRM and SBES pilots, establishment of multiple-use community forests and associated sustainable land management plans, will include direct participation of local communities, through FMCs, in order to ensure community buy-in and the appropriateness of on-the-ground interventions to address real community needs.</p>
Private sector	<p>The GEF Project will include private sector enterprises by promoting and training identified local businesses and communities in the establishment of suitable SBES solutions. The cultivation of private sector enterprises will facilitate the upscaling and rolling out of successful SBES activities to the broader community subsequent to project completion.</p>

Coordination with other ongoing and planned related initiatives

The principle baseline activities upon which the GEF Project will build are the ASERD, the National Water and Natural Resources Development Program (NWNRD) under MAIL, NEPA's ongoing baseline activities and the mandate of BED under MEW. In addition the project will build on the ongoing baseline activities of BORDA and MADERA's respective programmes in Afghanistan. These are described in greater detail in Section B.1. The GEF Project will build upon the activities undertaken under these baseline activities in a complementary manner in order to achieve the project goals. The project coordination unit for the GEF project will meet regularly with these programmes in order to ensure that the identified synergies are fully developed, and to facilitate feedback of information between the respective projects.

Several other GEF projects are currently underway in Afghanistan, and are being coordinated by NEPA. Through the central GEF focal point, interaction between these projects will be ensured, and wherever possible synergies in terms of training and project management will be developed:

GEF Trust Fund project "Developing core capacity for decentralised MEA implementation and natural resources management in Afghanistan" 2012 – 2015 (UNEP – US\$ 910,000). This project is designed to build national management and coordination capacity for the implementation of MEAs. An important outcome of this programme is the formation of a centralised GEF and MEA coordination entity housed within NEPA, which will allow Afghanistan to properly coordinate the implementation

of GEF projects. In addition, through building knowledge of the impacts of climate change and implementation capacity for MEAs within key national agencies, it will assist in laying the groundwork for the GEF Project's activities relating to REDD+ and CDM capacity-building.

LDCF project "Building adaptive capacity and resilience to climate change in Afghanistan" 2012 – 2016 (UNEP – US\$5,390,000). The focus of this project is primarily on the development of national adaptive capacity to increase resilience of vulnerable communities under conditions of climate change. The project will develop Afghanistan's national capacity relating to planning for and dealing with the effects of climate change. Additionally, the project has a strong focus on ecosystem management approaches to climate change adaptation at local and national levels. This has strong overlaps with the establishment of multiple-benefit forest restoration projects coupled with the CBNRM approach to be undertaken for ensuring SBESs in the GEF Project. The two projects will therefore regularly meet to exchange lessons learned, project successes and challenges, and to integrate these into on-going activities to enhance project success. The National Climate Change Committee will sit on the project steering committees for both these projects, ensuring that good oversight and understanding of the projects is provided from all necessary ministries.

GEF Trust Fund project "Establishing integrated models for protected areas and their co-management in Afghanistan" 2013 – 2016 (UNDP – US\$7.25 million). This project has recently been approved by the GEF, and will be accessing the CBD and CCD components of the GEF allocation. It is currently in the PPG phase. The principal focus of this project is on the operationalisation of a network of protected areas for Afghanistan, including the formation of a Parks and Wildlife Authority to administer them. Of particular relevance to the GEF Project is the establishment of sustainable land management procedures with communities around the proposed protected areas, and the building of capacity within MAIL and NEPA to implement the project activities. There is no direct overlap in project activities between these two projects, but lessons learned during project implementation will be exchanged to facilitate increased efficiency and effectiveness. It is anticipated that the sustainable land management approaches undertaken through this project will provide useful input for the GEF Project, whilst strategies for coordination of national and particularly local-level activities may be pertinent to the overall project.

Other proposed interactions:

The UNEP/Finland Koh-e-Baba Partnership for Women and Natural Resources is a UNEP project working with a local Afghan NGO, the Conservation Organisation for Afghanistan Mountain Areas (COAM). The principle focus of this small project was on community-based natural resource management for communities situated in Bamyán Province around the proposed Koh-e-Baba national conservation area. The project has implemented a clean cookstove initiative, as well as developed improved briquettes for burning, two models of locally-appropriate improved cookstoves, and a solar water heater. The project has distributed over 230 household stoves, set aside community conservation areas to protect local shrubs, established community woodlots and trained local communities. The total cost for this project was under US\$ 50,000. The very high cost effectiveness of this programme can provide valuable lessons for other potential biomass energy projects.

The USAID-funded Afghan Clean Energy Project (ACEP) (Sep 2009 – Sep 2011) built some rural capacity for off-grid and local electric power options, including photovoltaic, solar water heaters, wind and micro-hydropower plants in 12 provinces. It also established the KURE Lab, which provides renewable energy education, research, component testing and evaluation for engineers. KURE specifically focuses on solar, wind and water-generated power solutions. Collaboration between the GEF Project and KURE may facilitate the development of locally-adapted renewable energy solutions, and could strengthen the long-term integration of SBESs into national energy strategies as graduates of the system are taken up into civil service. The GEF Project could also build on the momentum already established in the project regions to mobilise communities to implement SBES solutions.

4.2 IMPLEMENTATION ARRANGEMENTS

Roles and responsibilities of the executing partners

Execution Partners: The project will be implemented through the FAO Representation in Afghanistan and its office in the MAIL compound in Darulaman. MAIL is proposed as the lead national executing partner of the project and will oversee the timely execution of project activities in participation with other project partners. The close working relationship established between FAO and MAIL over the last decade, and the mandate of FAO as the agricultural development partner and service provider to the Ministry, will support effective and coordinated implementation. However, as a result of the cross-sectoral focus of the project's activities, the active participation of MRRD, NEPA and MEW is required for execution of various outputs of the project. NEPA is requested to play a role of coordination – both between participating stakeholders as well as with other ongoing initiatives – and to chair the Project Steering Committee. This role is proposed to be suitable for NEPA on the basis of this agency's mandate as GEF Operational Focal Point and chair of the National Climate Change Committee.

The responsibilities of MAIL as lead executing agency will be managed by an appointed National Project Director (NPD). The NPD will be designated by MAIL in consultation with the FAO Budget Holder (BH) and the Lead Technical Officer (LTO). The NPD will be a senior staff member of the MAIL with relevant experience, and will be able to devote sufficient time to take part in the project during its implementation. Among the many duties of the NPD, he/she will act as the responsible focal point at the political and policy level within MAIL and he/she will ensure that all necessary support and inputs from Government personnel are provided by MAIL to enable the project to implement all of the proposed component activities. His/her Terms of Reference can be found in Appendix 6. For the first two years of the project, the NPD will get professional backstopping from a CTA in all ecological and climate change aspects of the project's activities.

Other executing government agencies of the project – specifically NEPA, MEW and MRRD – will be represented by suitably qualified focal points, to be nominated by the respective executing agencies and formally designated in participation with BH and LTO. These ministerial focal points will participate in key project management structures, particularly the PSC and NPIU, to guide implementation of the project's activities and support coordination with ongoing initiatives. Furthermore, the responsibilities of these national focal point representatives of NEPA, MEW and MRRD will include the facilitation of cooperation and support from provincial government representatives, thereby assuring high-level political support for the field-based work of the project undertaken by the Provincial Coordination Units (PCUs). All executing agencies should be represented in the Sustainable Biomass Energy Working Group (SBEWG) under Component 1. However, the individual representative of each ministry in the SBEWG may be the aforementioned national focal point or alternatively an additional individual nominated by the respective ministries.

An important objective of the PSC should be to ensure regular communication and clear coordination of activities between the above stakeholders. All participants should focus on identifying potential opportunities for synergies between ongoing projects and initiatives, while avoiding parallel activities and duplicated efforts.

MAIL – and its provincial representation DAIL – will be leading the implementation of activities under Component 2 of the GEF project with the support of project staff and Technical Service Providers (TSPs). In particular, the responsibility of MAIL in this component of the project will be the engagement and provision of technical guidance to support communities to establish FMCs and implement CBNRM plans. The NPD based in Kabul will ensure that Provincial Coordination Units, hosted by provincial MAIL representatives, are provided with adequate institutional support and resources to oversee the implementation of field-based activities in Components 2 and 3.

Other partners supporting project execution will work closely with MAIL through their nominated technical focal points at the national, provincial and local levels. NEPA is the GEF focal point and will assist with coordination within the project's components and participants, in addition to supporting coordination between the GEF project and other ongoing initiatives.

Under Component 1, MAIL, NEPA, MRRD and MEW will contribute to activities relating to institutional strengthening within their particular mandates to promote and implement SBES and CBNRM at a national level. Interventions under Component 2 will be led by MAIL with support from the provincial directorates of MRRD and NEPA, implemented through the Provincial Coordination Units (PCUs) established in each of the pilot provinces. Interventions under Component 3 will be led by the provincial directorates of MRRD in participation with MEW, with executional support from MAIL as necessary. Other execution partners for the project will include representatives of DDAs within each of the pilot districts and a targeted number of at least 20 CDCs within each pilot district.

The project is designed to achieve many of its key outputs by means of letters of agreement (LoA) with key partners. These LoA are listed under the “Contracts” Budget Line of the project budget. Further detail on results-based LoA work plans and budgets will be developed during inception phase of the project. Specific LoA will be elaborated and signed between FAO and the respective collaborating partners. Funds received under a LoA will be used to execute the project activities in conformity with FAO’s rules and procedures.

- a) *FAO’s role and responsibilities, as the GEF Agency (and as an executing agency, when applicable), including delineation of responsibilities internally within FAO*

FAO will be the GEF implementing agency. As the GEF Agency, FAO will be responsible for project oversight to ensure that GEF policies and criteria are adhered to, and that the project efficiently and effectively meets its objectives and achieves expected outcomes and outputs as established in the project document. FAO will report on project progress to the GEF Secretariat and financial reporting will be to the GEF Trustee. FAO will closely supervise the project by drawing upon its capacity at the global, regional and national levels, through the concerned units at FAO-HQ, the Sub-Regional Office in Bangkok and the FAO Representation in Afghanistan. There is a complete separation between the GEF oversight responsibilities and project execution roles and responsibilities, as described below. FAO, in consultation with the NPD, will deliver procurement and contracting services to the project using FAO rules and procedures, as well as financial services to manage the GEF resources. For more detail, please see description below.

Executing Responsibilities (Budget Holder): Under FAO’s Direct Execution modality, the FAO Representative in Afghanistan will be the Budget Holder (BH) of this project. The BH, working in close consultation with the Lead Technical Officer (LTO), will be responsible for timely operational, administrative and financial management of the project. The BH will head the multi-disciplinary Project Task Force established to support the implementation of the project and will ensure that technical support and inputs are provided in a timely manner. The BH will be responsible for financial reporting, procurement of goods and contracting of services for project activities in accordance with FAO rules and procedures. Final approval of the use of GEF resources rests with the BH, also in accordance with FAO rules and procedures.

Specifically, working in close collaboration with the LTO, the BH will: i) clear and monitor annual work plans and budgets; ii) schedule technical backstopping and monitoring missions; iii) authorize the disbursement of the project’s GEF resources; iv) give final approval of procurement, project staff recruitment, LoAs, and financial transactions in accordance with FAO’s clearance/approval procedures; v) review procurement and subcontracting material and documentation of processes and obtain internal approvals; vi) be responsible for the management of project resources and all aspects in the agreements between FAO and the various executing partners; vii) provide operational oversight of activities to be carried out by project partners; viii) monitor all areas of work and suggest corrective measures as required; ix) submit to the GEF Coordination Unit, the TCID Budget Group semi-annual budget revisions that have been prepared in close consultation with the LTO; x) be accountable for safeguarding resources from inappropriate use, loss, or damage; xi) be responsible for addressing recommendations from oversight offices, such as Audit and Evaluation; and xii) establish a multi-disciplinary FAO Project Task Force to support the project.

Operations and reporting - including the procurement of goods and contracting of services for Project activities - will be done in accordance with FAO rules and procedures. As such, FAO will, in close coordination with the NPD, be responsible for the timely recruitment of key project posts listed above such as the NPD and the CTA. In accordance with FAO rules and procedures, final approval of the use of GEF resources rests with the FAO Representation in Afghanistan.

The FAO Lead Technical Unit (LTU). The Forest Assessment Management and Conservation Division of FAO's Forestry Division (FD) will be the LTU within FAO for this Project and will provide overall technical guidance to its implementation. FOM will delegate the responsibility for direct technical supervision to the FAO Regional Office for Asia Pacific (RAP) - Natural Resources and Environment Group (NREG).

FAO Lead Technical Officer (LTO) The Senior Forestry Officer of RAP/NREG will be the LTO for the Project and will have primary accountability for the timeliness and quality of the technical services provided throughout project execution. The LTO will work in close collaboration with the National Project Director. Under the general technical oversight of the LTU, the LTO will provide technical guidance to the Project team to ensure delivery of quality technical outputs. The LTO will coordinate the provision of appropriate technical backstopping from all the concerned FAO units represented in the Project Task Force. The Project Task Force is thus composed of technical officers from the participating units (see below), operational officers, the Investment Centre Division/GEF Coordination Unit and is chaired by the BH. The primary areas of LTO support to the project include:

- review and ensure clearance by the relevant FAO technical officers of all the technical Terms of Reference (TOR) of the project team and consultants;
- ensure clearance by the relevant FAO technical officers of the technical terms of reference of the LoA and contracts;
- in close consultation with MAIL, MRRD, NEPA, and MEW review and clear the selection of the project staff, consultants and other institutions to be contracted or with whom an LoA will be signed; as well as review and clear technical reports, publications, papers, training material, manuals, etc.;
- monitor technical implementation as established in the project results framework;
- review the Project Progress Reports (PPRs) and prepare the annual Project Implementation Review (PIR);
- represent FAO in the PSC;
- provide technical support to the National Project Director;
- provide technical inputs to procurement and contract documentation;
- review and clear final technical products delivered by consultants and contract holders financed by GEF resources before the final payment can be processed; and
- support the NPIU in preparing the AWP/B, with support from the Budget Holder and clearing it prior to submission to the PSC.

FAO Project Task Force (FAO-PTF). The FAO-PTF will be led by the Budget Holder and include the LTU, LTO, TCI Asia Service and GEF Coordination Unit, and other technical units supporting the project's work. The main role of the task force is to provide technical guidance to the LTO and the NPIU for the implementation of the project, contribute to specific project activities as required, and troubleshoot should implementation issues arise.

FAO GEF Coordination Unit in Investment Centre Division will review and approve PPRs, annual PIRs and results-based financial reports and budget revisions. The GEF Coordination Unit will organize annual independent supervision missions, in consultation with the LTU, LTO, the BH and TCIB. The PIRs will be included in the FAO GEF Annual Monitoring Review submitted to GEF by the GEF Coordination Unit. The GEF Coordination Unit will work closely with the FAO Evaluation Office (OEDD) to ensure that the project's mid-term review and final evaluations meet GEF requirements by reviewing evaluation ToRs and draft evaluation reports. Should the PIRs or mid-term review highlight risks affecting the timely and effective implementation of the project, the GEF

Coordination Unit will work closely with the BH and LTO to make the needed adjustments in the project's implementation strategy.

The **Investment Centre Division Budget Group (TCID)** will provide final clearance of any budget revisions.

The **FAO Finance Division** will provide annual Financial Reports to the GEF Trustee and, in collaboration with the GEF Coordination Unit and the TCID Budget Group, call for project funds on a six-monthly basis from the GEF Trustee.

b) Project technical, coordination and steering committees

Project Steering Committee (PSC): A project PSC will be established and chaired by NEPA with the participation of MRRD, MAIL, MEW, and FAO. Women's participation will be prioritised and promoted. Observers from NGOs (such as MADERA and BORDA) as well as academia (such as Kabul University) will also be invited to participate. The PSC will meet a minimum of once a year and its specific responsibilities will be: i) overall oversight of project progress and achievement of planned results as presented in the results-based annual work plan and budget (AWPB) and reported in six-monthly Project Progress Reports; ii) take decisions in the course of the practical organization, coordination and implementation of the project; iii) facilitate cooperation between the NPIU and project participating partners; iv) advise the NPIU on other on-going and planned activities facilitating collaboration between the Project and other programmes, projects and initiatives in Afghanistan; v) facilitate that co-financing support is provided in a timely and effective manner; and vi) review six-monthly Project Progress and Financial Reports/Budget Revisions and approve AWP/B.

Technical Working Group: A Sustainable Biomass Energy Working Group will be established and chaired by MAIL, with the voluntary participation of MRRD, MEW, NEPA, FAO, UNEP, NGOs (such as BORDA and MADERA), BCA, and academia (such as Kabul University). The working group will coordinate with the NPIU and, where appropriate, will provide technical support and guidance for GEF project interventions.

National Project Implementation Unit (NPIU): will be hosted by MAIL and will be responsible for day-to-day project operations. The role of the NPIU will be, in close consultation with the PSC and Sustainable Biomass Energy Working Group members, to ensure the coordination and execution of the Project through the timely and efficient implementation of annual work plans. The NPIU will act as secretariat to the PSC. It will coordinate work and follow the implementation of project activities closely, handle day-to-day project issues and requirements, coordinate project interventions with other on-going activities and ensure a high degree of provincial and local inter-institutional collaboration, monitor project progress and ensure the timely delivery of inputs and outputs. It will organize workshops and annual meetings for the GEF project for monitoring project progress and develop results-based work plans with detailed budget for the next year to be approved by the PSC. It will be responsible for implementing the project's M&E plan, setting up and managing its monitoring system and communication programme, the elaboration of six-monthly Project Progress Reports and assist in the preparation of the annual Project Implementation Review (PIR) and midterm and final evaluations, which include gender reports. Project Progress Reports on implemented activities and progress in achieving project outputs and outcomes, and financial statements of expenditures and status for the previous year will be submitted together with the Annual Work Plan and detailed Budget (AWP/B) to the PSC and FAO via MAIL's Project Director.

The NPIU will consist of the following MAIL, MRRD, NEPA, and MEW staff:

- a part-time Project Director from MAIL in charge of overall coordination and supervision of the project and coordination with other sector departments;
- a full time **National Project Manager (NPM)** managing project information and documentation, and distribution of project reports, newsletters and training materials to relevant stakeholders; managing project M&E, and conducting regular field M&E visits to project sites. The NPM will

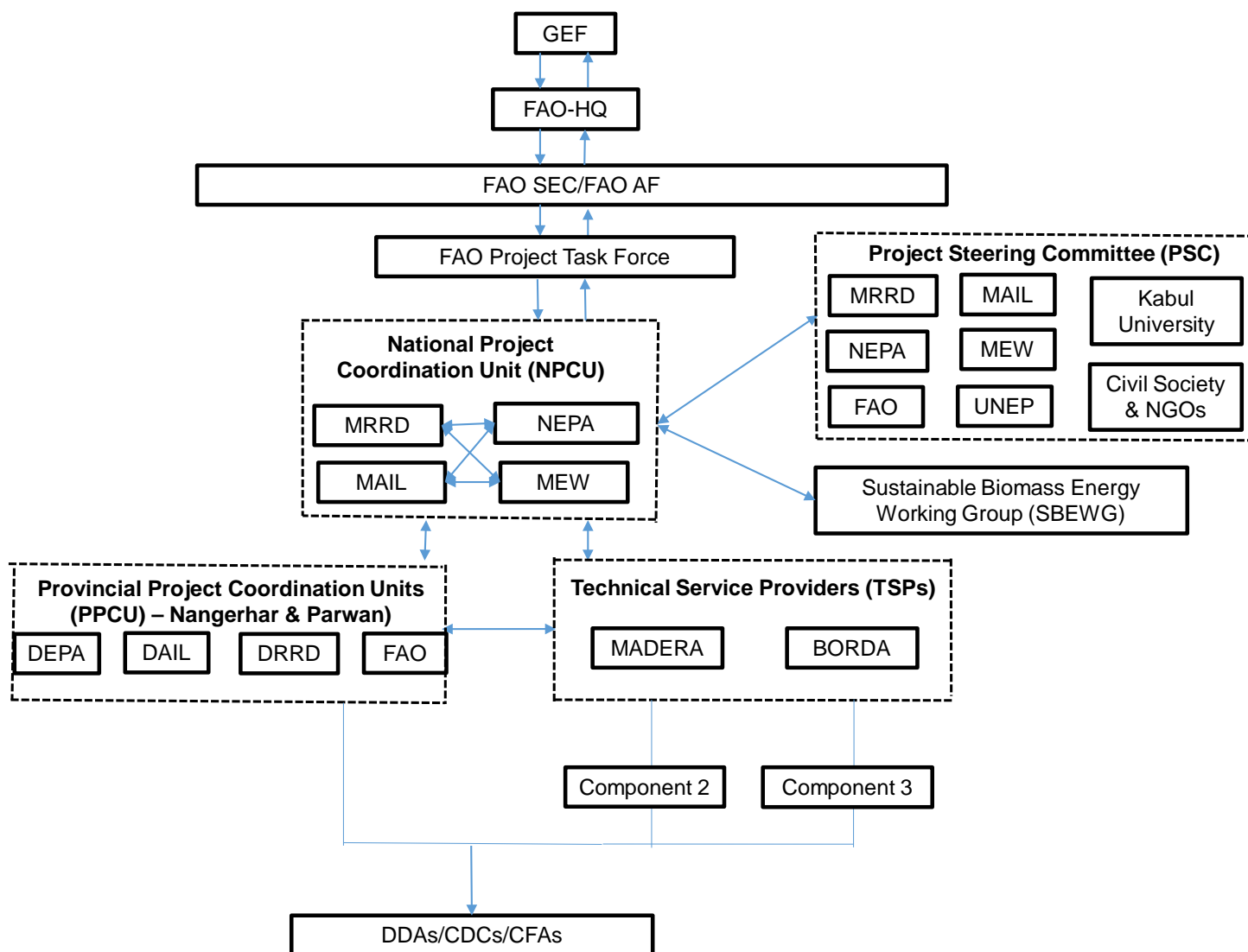
be in charge of daily project management and technical supervision including, preparing AWP/B and allocating tasks to Field Offices, preparing TORs and technical requirements for consultancy services contracting documents and material and equipment procurement documents, providing technical supervision and guidance to the Field Offices in implementing project activities, conducting regular field supervision visits and provide on-site guidance to local technical staff, day-to-day coordination and communication with Field Office staff in charge of the GEF project, and preparing the project progress reports;

- an **Administrative and Financial Assistant** (based in the FAO Representation) in charge of preparing visa and travel requests for the employees of the Project, consultants in accordance with FAO standard operating procedures, solution of organizational issues on project staff's travel; preparing of short-term contracts in accordance with FAO requirements and procedures and exercising control over observance of contract terms and periods; developing of a catalogue of materials on monitoring of the project and project activities (correspondence, reports, budget and financial expenses) in accordance with FAO requirements; preparing logistics of workshops, working meetings, delegations, field expeditions and etc. The administrative and financial assistant will also be responsible for finances. These duties include preparing detailed budgets for cash transfer requests based on the AWP/B and project account cash balance, keeping the financial records and regular review of the project account, reviewing the receipts and financial reports submitted by field offices and sub-contractors and preparing six-monthly financial statement of expenditures, preparing the personnel and services contracting and procurement documents and participate in contracting and procurement processes including of submission of documentation to FAO for ex-antes clearances, and preparing relevant documents for internal and external financial audits;
- a Chief Technical Advisor (CTA) will provide professional backstopping for all aspects of ecosystem-based approaches for climate change mitigation, organic farming, rangeland management and agroforestry as well as environmental awareness, education and capacity building. He/She has to ensure that the project is an active member of a broader knowledge management network on adaptation to climate change and natural resource and land management. This includes emphasising a learning and adaptive approach to project management and implementation in close cooperation with the national partners. The CTA will work closely with the National Project Manager and will deputize him/her when necessary.

Provincial Coordination Units (PCUs) will function as field offices and will be responsible for pilot site activities and work under supervision of the NPIU and work closely with local stakeholders and resource user associations. The PCUs will be staffed by a Provincial Field Site Coordinator and Technical assistants funded by GEF and reporting to the NPIU, as well as other specialised national consultants that support pilot site activities and local staff seconded to the project.

Provincial Coordinating Committee (PCC): The mandate of the PCC will be to: i) provide advice on relevant policies, actions and measures in particular related to participation of local communities at the pilot sites in Nangarhar and Parwan; ii) provide new ideas and thinking on conflict resolution over management of natural resources, options for increased carbon sequestration and sustainable use, and creative initiatives on how to increase public awareness of socio-economic and global environmental benefits generated by CBNRM; and iii) promote communications between the government agencies and local communities and the private sector. The composition of the PCC will include representatives from local DDAs, CDCs, CFCCs/CFAs, as well as provincial representation from MAIL, MRRD, NEPA and MEW. Women's participation will be prioritised and promoted. The PCC will meet back-to-back with the PSC to provide consolidated advice on stakeholder participation and engagement.

c) Organizational chart



4.3 FINANCIAL PLANNING AND MANAGEMENT

4.3.1 Financial plan (by component, outputs and co-financier)

Component/output	BORDA	MADERA	MRRD	MAIL	NEPA	MEW	FAO	Total Co-financing	% Co-financing	GEF	% GEF	Total
Component 1: Strengthening the national policy environment to support sustainable biomass energy systems (based on CBNRM), laying the ground work for investment promotion and future access to carbon markets	12686	5306	166337	150630	44648	69307	200000	648914	81%	154944	19%	803858
1.1	-	-	30375	27507	8153	12656	50000	128692	82%	28295	18%	156987
1.2	12686	5306	22002	19924	5906	9167	50000	124991	86%	20495	14%	145486
1.3	-	-	69538	62971	18665	28974	50000	230149	78%	64775	22%	294924
1.4	-	-	44422	40227	11924	18509	50000	165082	80%	41379	20%	206461
Component 2: Developing community-based natural resource management (CBNRM) plans and establishing community forests in 2 project areas	-	155808	-	600162	177895	-	200000	1133865	65%	617352	35%	1751217
2.1	-	44865	-	172817	51225	-	50000	318907	64%	177767	36%	496673
2.2	-	34209	-	131772	39059	-	50000	255041	65%	135547	35%	390587
2.3	-	32506	-	125210	37114	-	50000	244830	66%	128797	34%	373627
2.4	-	44228	-	170363	50497	-	50000	315088	64%	175242	36%	490330
Component 3: Promoting the demonstration and deployment of sustainable biomass energy systems, with a CBNRM approach	437314	-	758469	-	203589	316029	200000	1915400	73%	706519	27%	2621919
3.1	132545	-	229884	-	61706	95785	40000	559920	72%	214139	28%	774059
3.2	78451	-	136065	-	36523	56694	40000	347732	73%	126745	27%	474477
3.3	58892	-	102141	-	27417	42559	40000	271008	74%	95145	26%	366153
3.4	80680	-	139929	-	37560	58304	40000	356473	73%	130345	27%	486818

3.5	86746	-	150450	-	40384	62687	40000	380267	73%	140145	27%	520412
Component 4: Awareness raising and monitoring and evaluation	-	-	108278	98053	29064	45116	200000	480511	83%	100862	17%	581372
4.1	-	-	32016	28993	8594	13340	66667	149609	83%	29823	17%	179433
4.2	-	-	18593	16837	4991	7747	66667	114834	87%	17319	13%	132153
4.3	-	-	57669	52223	15480	24029	66667	216068	80%	53719	20%	269787
Project Management	-	-	166917	151155	44804	69549	200000	632424	80%	155484	20%	787908
Total Project	450000	161114	1200000	1000000	500000	500000	1000000	4811114	73%	1735160	27%	6546274

4.3.2 GEF inputs

GEF grant resources totalling **USD1,735,160** over the three-year life of the project are allocated primarily for the provision of technical assistance, for capacity building and training, for technical assessments to support the pilot demonstration activities, and for the development and implementation of pilot demonstration activities. The GEF funds will finance inputs needed to generate the outputs and outcomes under the project. These include: i) local and international consultants for technical support and project management; ii) inputs for implementation of pilot site demonstration activities (e.g. procurement of materials for SBESs, forestry interventions, training materials and printing of publications); iii) LoAs/contracts with technical institutions and service providers supporting the delivery of specific project activities on the ground; iv) travel, expendable and non expendable office equipment; and v) training and awareness raising material.

4.3.3 Government inputs

MAIL will provide USD1,000,000 of in-kind co-financing support provided as staff-time, office space, equipment, and extension services. Support of MAIL project staff is particularly important to the execution of field-based activities and to central coordination of project stakeholders through the National Project Implementatin Unit. The total co-financing from MAIL to the GEF project thus comes to **USD1,000,000**.

NEPA will provide support to planning and implementation of NRM in the field-based activities and will support central coordination and planning through a designated chairperson of the PSC. NEPA's in-kind co-financing support will primarily be provided as allocation of supporting staff and operational support. NEPA will provided in-kind co-financing of **USD500,000**.

MRRD will provide support to joint planning activities for the dissemination of SBESs through community-based structures and concomitant training and capacity-building of communities. MRRD will provide supporting staff and technical backstopping to identify priority activities, best practices, and opportunities to replicate and upscale the project's activities. Under the ASERD programme, MRRD is making a total investment of ~USD191 million in promotion and dissemination of renewable energy. Of this total investment, the largest proportion of finance is allocated to dissemination of rural energy technologies. The latter outcome is supported by three complementary outcomes, of which two in particular provide the baseline co-finance investment that will support the GEF project. The two outcomes of the ASERD programme that will provide a baseline foundation for the GEF project include Outcome 2: Policy and Regulation (USD723,078 in the period 2015–2017); and Outcome 4: Capacity Development and Outreach (USD1,286,156) in the period 2015–2017). The ongoing investments of MRRD in community governance and local-level capacity building will provide foundational support to the project's community-based activities and central coordination, amounting to a total co-financing of **USD1,200,000**.

4.3.4 FAO inputs

FAO will provide technical assistance, backstopping, training and supervision of the execution of activities financed by GEF resources with a co-financing commitment of **USD1,000,000**. The GEF project will complement and be supported by ongoing investments by several projects and activities implemented by the FAO Representation in Afghanistan.

4.3.5 Other co-financiers inputs

Financial Records. FAO shall maintain a separate account in United States dollars for the project's GEF resources showing all income and expenditures. Expenditures incurred in a currency other than United States dollars shall be converted into United States dollars at the United Nations operational rate of exchange on the date of the transaction. FAO shall administer the project in accordance with its regulations, rules and directives.

Financial Reports. The BH shall prepare six-monthly project expenditure accounts and final accounts for the project, showing amount budgeted for the year, amount expended since the beginning of the year, and separately, the un-liquidated obligations as follows:

1. Details of project expenditures on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the project document, as at 30 June and 31 December each year.
2. Final accounts on completion of the project on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the project document.
3. A final statement of account in line with FAO Oracle project budget codes, reflecting actual final expenditures under the project, when all obligations have been liquidated.

The BH will submit the above financial reports for review and monitoring by the LTO and the FAO GEF Coordination Unit. Financial reports for submission to the donor (GEF) will be prepared in accordance with the provisions in the GEF Financial Procedures Agreement and submitted by the FAO Finance Division.

Budget Revisions. Semi-annual budget revisions will be prepared by the BH in accordance with FAO standard guidelines and procedures.

Responsibility for Cost Overruns. The BH is authorised to enter into commitments or incur expenditures up to a maximum of 20 percent over and above the annual amount foreseen in the project budget under any budget sub-line provided the total cost of the annual budget is not exceeded.

Any cost overrun (expenditure in excess of the budgeted amount) on a specific budget sub-line over and above the 20 percent flexibility should be discussed with the GEF Coordination Unit with a view to ascertaining whether it will involve a major change in project scope or design. If it is deemed to be a minor change, the BH shall prepare a budget revision in accordance with FAO standard procedures. If it involves a major change in the project's objectives or scope, a budget revision and justification should be prepared by the BH for discussion with the GEF Secretariat.

Savings in one budget sub-line may not be applied to overruns of more than 20 percent in other sub-lines, even if the total cost remains unchanged, unless this is specifically authorised by the GEF Coordination Unit upon presentation of the request. In such a case, a revision to the project document amending the budget will be prepared by the BH.

Under no circumstances can expenditures exceed the approved total project budget or be approved beyond the NTE date of the project. **Any over-expenditure is the responsibility of the BH.**

Audit. The project shall be subject to the internal and external auditing procedures provided for in FAO financial regulations, rules and directives and in keeping with the Financial Procedures Agreement between the GEF Trustee and FAO.

The audit regime at FAO consists of an external audit provided by the Auditor-General (or persons exercising an equivalent function) of a member nation appointed by the Governing Bodies of the Organisation and reporting directly to them, and an internal audit function headed by the FAO Inspector-General who reports directly to the Director-General. This function operates as an integral part of the Organisation under policies established by senior management, and furthermore has a reporting line to the governing bodies. Both functions are required under the Basic Texts of FAO which establish a framework for the terms of reference of each. Internal audits of imprest accounts, records, bank reconciliation and asset verification take place at FAO field and liaison offices on a cyclical basis.

4.4 PROCUREMENT

Careful procurement planning is necessary for securing goods, services and works in a timely manner, on a “Best Value for Money” basis, and in accordance with the Rules and Regulations of FAO. It requires analysis of needs and constraints, including forecast of the reasonable timeframe required to execute the procurement process. Procurement and delivery of inputs in technical cooperation projects follow FAO’s rules and regulations for the procurement of supplies, equipment and services (i.e. Manual Sections 502 and 507). *Manual Section 502*: “Procurement of Goods, Works and Services” establishes the principles and procedures that apply to procurement of all goods, works and services on behalf of the Organisation, in all offices and in all locations, with the exception of the procurement actions described in Appendix A – Procurement Not Governed by Manual Section 502. *Manual Section 507* establishes the principles and rules that govern the use of Letters of Agreement (LoA) by FAO for the timely acquisition of services from eligible entities in a transparent and impartial manner, taking into consideration economy and efficiency to achieve an optimum combination of expected whole life costs and benefits (“Best Value for Money”).

As per the guidance in FAO’s Project Cycle Guide, the BH will draw up an annual procurement plan for major items which will be the basis of requests for procurement actions during implementation. The first procurement plan will be prepared at the time of project start-up, if not sooner. The plan will include a description of the goods, works, or services to be procured, estimated budget and source of funding, schedule of procurement activities and proposed method of procurement. In situations where exact information is not yet available, the procurement plan should at least contain reasonable projections that will be corrected as information becomes available.

4.5 MONITORING AND REPORTING

Monitoring and evaluation of progress in achieving project results and objectives will be done based on the targets and indicators established in the Project Results Framework (Appendix 1 and described in section 2.3 and 2.4). The project M&E Plan has been budgeted at US\$55,000 (see table 16 in section 4.5.4). M&E activities will follow FAO and GEF M&E policies and guidelines. Integrated into all Outcomes, the Project M&E approach will also facilitate learning and mainstreaming of project outcomes and lessons learned into international good practice as well as national and local policies, plans and practices. In addition to these budgeted M&E activities, the regular monitoring and reporting of the project’s progress towards targets related to GHG emission reductions will be the primary responsibilities of the international and national carbon monitoring experts, who will be tasked with collecting and compiling data to inform reporting on GHG emission reduction targets.

4.5.1 Oversight and monitoring responsibilities

The M&E tasks and responsibilities clearly defined in the Project’s detailed Monitoring Plan (see below) will be achieved through: (i) day-to-day monitoring and supervision of project progress (NPIU and PCU offices); (ii) technical monitoring of carbon benefits and ecosystem “status” indicators (NPIU and PCU offices in coordination with other relevant participating technical units at provincial and district level); (iii) specific monitoring plans for carbon sequestration and emissions avoided (NPIU and PCU with support from local communities and other stakeholders); (iv) midterm and final evaluations (independent consultants and FAO Evaluation Office); and (v) continual oversight, monitoring and supervision missions (FAO).

At the initiation of implementation of the GEF Project, the NPIU will set up a project progress monitoring system. Participatory and gender-sensitive mechanisms and methodologies for systematic data collection and recording will be developed in support of outcome and output indicator M&E.

The Project’s Inception Phase begins upon FAO approval of the Project and signature of the Execution Agreement. During the three-month inception phase, specific Project M&E issues will be refined and subsequently discussed at the Inception Workshop (IW): (i) the Project’s RF indicator targets and their means of verification, and assumptions and risks; (ii) the M&E indicators and their baseline; (iii) drafting the required clauses to include in consultants’ ToRs to ensure they complete their M&E reporting functions (if relevant); and (iv) provision of a detailed overview of reporting, M&E

requirements and the respective M&E tasks among the project's different stakeholders; (iv) based on the Project RF and the relevant GEF Tracking Tools, finalisation of the first annual work plan; (v) financial reporting procedures and obligations, and arrangements for annual audit; (vi) schedule of PCC meetings. Roles and responsibilities of all project organisation structures will be clarified and meetings planned.

The Inception Phase will conclude with the holding of an Inception Workshop (IW) organised by the NPIU. The IW will: (a) assist all stakeholders to fully understand and take ownership of the Project; (b) review and confirm/finalise Project indicators and results framework with stakeholders; (c) Review the Project's first AWP with results-based annual budget; (d) discuss the roles, functions, and responsibilities within the Project's decision-making structures; (e) review a detailed M&E work plan and budget based on the M&E plan summary presented in Table 16 below. The first PSC meeting will be held within the two months of the IW.

The day-to-day monitoring of the Project implementation will be the responsibility of the NPIU under the leadership of the NPM, and supported by the CTA. One NPIU staff member will be clearly mandated to be responsible for Project M&E. M&E is to be driven by the preparation and implementation of an AWP/B followed up through six-monthly PPRs. The preparation of the AWP/B and semi-annual PPRs will represent the product of a unified planning process between main project partners. As tools for results-based-management, the AWP/B will identify the actions proposed for the coming project year and provide the necessary details on output targets to be achieved, and the PPRs will report on the monitoring of the implementation of actions and the achievement of output targets.

Following the approval of the Project, the project's first year AWP/B will be adjusted (either reduced or expanded in time) to synchronise it with an annual reporting calendar. In subsequent years, the FSP work plan and budget will follow an annual preparation and reporting cycle as specified in section 4.5.3 below.

4.5.2 Indicators and information sources

The project's result-based framework (RF) indicators will be the main reference point for M&E of Project outcomes, including contributions to global environmental benefits (see Appendix 1). The RF's indicators and means of verification will be applied to monitor Project performance and impact. Data collected will be of sufficient detail to track outputs and outcomes and flag Project risks early on, using FAO's monitoring procedures and progress reporting formats. The NPIU will link each AWP/B to the RF indicators to ensure that Project implementation maintains a focus on achieving the impact indicators as defined. An important element to this will be the elaboration and monitoring of output target indicators in each AWP/B that cumulatively lead to outcome level results. Output targets will be monitored on a semi-annual basis and outcome target indicators will be monitored on an annual basis if possible or as part of the mid-term and final evaluations.

The main sources of information to support the M&E programme will be: i) participatory progress monitoring and workshops with beneficiaries; ii) on-site monitoring of the implementation of forest management plans; iii) PPRs prepared by the NPIU; iv) consultants reports; v) participants training tests and evaluations; vi) mid-term and post project impact and evaluation studies completed by independent consultants; vii) financial reports and budget revisions; viii) PIR prepared by the LTO supported by the BH and the NPIU; and ix) FAO supervision mission reports.

4.5.3 Reporting schedule

Specific reports that will be prepared under the M&E program are: i) Project inception report; ii) Annual Work Plan and Budget (AWP/B); iii) Project Progress Reports (PPRs); iv) annual Project Implementation Review (PIR); v) Technical Reports; vi) co-financing reports; and vii) Terminal Report. In addition, assessment of the GEF Monitoring Evaluation Tracking Tools (METTs) against the baseline (completed during project preparation) will be required at midterm and final project evaluation.

Project Inception Report. Immediately after the Inception Workshop (IW), the NPIU will prepare a

project inception report in consultation with the LTO, BH and other project partners. The report will include a narrative on the institutional roles and responsibilities and coordinating action of project partners, progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. It will also include a detailed first year AWP/B, a detailed project monitoring plan based on the M&E plan summary presented in section 4.5.4 below. The draft inception report will be circulated to the LTO and for review and comments before its finalisation, no later than one month after project start-up. The report should be cleared by the FAO BH, LTO and the FAO GEF Coordination Unit and uploaded in FPMIS by the BH.

Results-based Annual Work Plan and Budget (AWP/B). The draft of the first AWP/B will be prepared by the NPIU in consultation with the Project Task Force and reviewed at the project Inception Workshop. The IW inputs will be incorporated and the NPIU will submit a final draft AWP/B within two weeks of the IW to the BH. For subsequent AWP/B, the NPIU will organise a project progress review and planning meeting for its review. Once comments have been incorporated, the BH will circulate the AWP/B to the LTO and the GEF Coordination Unit for comments/clearance prior to uploading in FPMIS by the BH. The AWP/B must be linked to the project's Results Framework indicators so that the project's work is contributing to the achievement of the indicators. The AWP/B should include detailed activities to be implemented to achieve the project outputs and output targets and divided into monthly timeframes and targets and milestone dates for output indicators to be achieved during the year. A detailed project budget for the activities to be implemented during the year should also be included together with all monitoring and supervision activities required during the year. The AWP/B should be approved by the Project Steering Committee and uploaded on the FPMIS by the BH.

Project Progress Reports (PPR): PPRs will be prepared based on the systematic monitoring of output and outcome indicators identified in the project's Results-based Framework (Appendix 1). The purpose of the PPR is to identify constraints, problems or bottlenecks that impede timely implementation and to take appropriate remedial action. In consultation with the Project Task Force, the NPIU will prepare semi-annual PPRs and submit them to the BH and LTO in a timely manner. PPRs will be prepared based on the systematic monitoring of output and outcome indicators identified in the Project Results Matrix. They will also report on projects risks and implementation of the risk mitigation plan. The BH and LTO will review the progress reports and circulate them to the FAO Project Task Force and GEF Coordination Unit for comments and clearance. In the event of LTO/GEF Coordination Unit comments, the PMO will incorporate them and the revised PPR is re-submitted to the LTO for final endorsement. The BH will submit the draft final version of each PPR to the GEF Coordination Unit for final approval and uploading on the FPMIS. The six-monthly PPRs will be submitted to the GEF Coordination Unit as follows:

- the period 1 January – 30 June and to be submitted no later than 31 July;
- the period 1 July – 31 December to be submitted no later than 31 January.

Annual Project Implementation Review (PIR): The LTO supported by the NPIU and BH, will prepare an annual PIR covering the period July (the previous year) through June (current year) to be submitted to the GEF Coordination Unit for review and approval **no later than 31 July**. The FAO GEF Coordination Unit will clear and submit it to the GEF Secretariat and GEF Evaluation Office as part of the Annual Monitoring Review report of the FAO-GEF portfolio. The GEF Coordination Unit will provide the updated format when the first PIR is due. PIRs will be uploaded on the FPMIS by the GEF Coordination Unit.

Technical Reports: Technical reports will be prepared as part of project outputs and to document and share project outcomes and lessons learned. The drafts of any technical reports must be submitted by the NPIU to the BH who will share it with the LTO. The LTO will be responsible for ensuring appropriate technical review and clearance of said report. The BH will upload the final cleared reports onto the FPMIS. Copies of the technical reports will be distributed to project partners and the Project Steering Committee as appropriate.

Co-financing Reports: The BH, with support from the NPIU, will be responsible for collecting the required information and reporting on in-kind and cash co-financing as indicated in the Project Document/CEO Request. The NPIU will compile the information received from the executing partners

and transmit it in a timely manner to the LTO and BH. The report, which covers the period 1 July through 30 June, is to be submitted on or before 31 July and will be incorporated into the annual PIR. The format and tables to report on co-financing can be found in the PIR.

GEF-5 Tracking Tools: Following the GEF policies and procedures, the GEF5 climate change mitigation (CCM) tracking tools will be submitted at three moments: i) with the project document at CEO endorsement; ii) at the project's mid-term evaluation; and iii) with the project's terminal evaluation or final completion report. At project mid-term and end, the tracking tool will be completed by the NPIU in close consultation with the NPD and the LTO.

Terminal Report: Within two months before the end date of the project, the NPIU will submit to the BH and LTO a draft Terminal Report. The main purpose of the Terminal Report is to give guidance at ministerial or senior government level on the policy decisions required for the follow-up of the project, and to provide the donor with information on how the funds were utilised. The Terminal Report is accordingly a concise account of the main products, results, conclusions and recommendations of the project, without unnecessary background, narrative or technical details. The target readership consists of persons who are not necessarily technical specialists but who need to understand the policy implications of technical findings and needs for insuring sustainability of project results. Work is assessed, lessons learned are summarised, and recommendations are expressed in terms of their application to Afghanistan's ongoing work on sustainable CBNRM, renewable energies, and CCM in the context of its development priorities, as well as in practical execution terms. This report will specifically include the findings of the final evaluation. A final project review meeting should be held to discuss the draft Terminal Report before it is finalised by the NPIU and approved by the FAO LTO and the GEF Coordination Unit.

4.5.4 Monitoring and evaluation plan summary

Table 15. Summary of the main M&E reports, responsible parties and timeframe.

Type of M&E Activity	Responsible Parties	Time-frame	Budgeted costs
Inception Workshop	NPIU supported by the FAO LTO, BH, and the GEF Coordination Unit	Within two months of project start up	US\$5,000
Project Inception Report	NPIU cleared by FAO LTO, BH, and the GEF Coordination Unit	Immediately after workshop	-
Supervision visits and rating of progress in PPRs and PIRs	NPIU, FAO LTO and TCI/GEF Coordination Unit	Annual or as required	The visits of the FAO LTO and the GEF Coordination Unit will be paid by GEF agency fee. The visits of the NPM/NPIU will be paid from the project travel budget
Project Progress Reports	NPIU, with inputs from Field Offices and other partners	Six-monthly	-
Project Implementation Review report	LTO supported by the NPIU and BH and cleared and submitted by the GEF Coordination Unit to the GEF Secretariat	Annual	Paid by GEF agency fee
Co-financing Reports	BH with inputs from NPIU	Annual	Paid by GEF agency fee

Type of M&E Activity	Responsible Parties	Time-frame	Budgeted costs
Technical reports	NPIU, LTO and uploaded on the FPMIS by the BH	As appropriate	-
GEF LD, LULUCF and REDD+ Tracking Tools	NPIU and LTO	Updated at the time of the mid-term evaluation and final evaluation	GEF fee
Two annual review workshops (Years 1 and 2).	FAO Evaluation Office (OEDD) in consultation with the FAOR/Afghanistan, GEF Coordination Unit and project team	After Year 1 and Year 2 of project implementation	US\$5,000 each for two annual review workshops and delivery of review reports (US\$10,000 total). The agency fee will pay for expenditures of FAO staff time and travel.
Final evaluation	FAO Evaluation Office (OEDD) in consultation with the FAOR/Afghanistan, GEF Coordination Unit and project team	At the end of project implementation	US\$30,000 for external consultant. In addition the agency fee will pay for expenditures of FAO staff time and travel
Terminal Report	NPIU, LTO, GEF Coordination Unit, TCSR Report Unit	At least two months before the end date of the Execution Agreement	US\$10,000
Total			US\$55,000

4.6 PROVISION FOR EVALUATIONS

The progress of the project towards achieving targeted outcomes will be assessed on an annual basis during annual review workshops, held at the end of the first and second years of implementation. These workshops will focus on assessing progress and effectiveness of implementation in terms of achieving Project objectives, outcomes, and outputs. Findings and recommendations of these evaluation workshops will be instrumental for bringing improvement in the overall project design and execution strategy for the remaining period of the project's term if necessary. FAO will arrange for the review workshops in consultation with project management. The review workshops will, *inter alia*:

- review the effectiveness, efficiency and timeliness of project implementation;
- analyse effectiveness of partnership arrangements;
- identify issues requiring decisions and remedial actions;
- propose any mid-course corrections and/or adjustments to the implementation strategy as necessary; and
- highlight technical achievements and lessons learned derived from project design, implementation and management.

An independent final evaluation will be carried out three months prior to the terminal review meeting of the project partners. The final evaluation would aim to identify the project impacts and the sustainability of project results and the degree of achievement of long-term results. This evaluation would also have the purpose of indicating future actions needed to expand on the existing project in subsequent phases, mainstream and up-scale its products and practices, and disseminate information to management authorities responsible for related issues to ensure replication and continuity of the processes initiated by the project.

4.7 COMMUNICATION OF PROJECT RESULTS AND VISIBILITY

Giving high visibility to the project and ensuring effective communications in support of the Project's message is to be addressed through a number of activities that have been incorporated into the Project design. These include: i) the enhanced policy, legal and institutional framework as well as increased understanding and awareness of CBNRM and renewable energies under component 1 which will give visibility of the project from high-level sector decision-makers to local communities; ii) the recruitment of one NPIU staff member responsible (inter alia) for communications and knowledge management; iii) the preparation of documents and communication tools that capture the Project's economic, ecological and social benefits; and iv) several awareness raising activities.

These inputs and activities will be integrated into the Project Workplan, and, as such, will come out of the Project's technical activities rather than be stand-alone activities.

SECTION 5 – SUSTAINABILITY OF RESULTS

5.1 SOCIAL SUSTAINABILITY

In general, the sustainability of the project's activities is supported by the following design features and outputs.

During the PPG phase, the importance of selecting pilot districts in provinces which are relatively secure, stable and accessible by road was emphasised. Consequently the project's pilot interventions will be trialled in areas where the risk of disruption due to security challenges is perceived to be low. Furthermore, stakeholders noted the importance of prioritising districts in which there are well-established and active Community District Councils (CDCs). Consequently, the project will identify suitable pilot districts and CDCs in close participation with knowledgeable provincial and district-level authorities.

The sustainability of the project's interventions will be strongly supported by the ongoing investments in capacity-building through the NABDP. One of the priority themes of the National Area-based Development Programme (NABDP) is to strengthen district-level institutions to independently address priority local needs, and it is anticipated that NABDP will continue to develop the capacity of District Development Assemblies (DDAs) through 2015 to coordinate and facilitate their role as a medium for bringing about rural development. The project will focus on designing and implementing activities through the district- and community-level structures established through the NABDP, thereby strengthening the national-scale investments in decentralised capacity building. As a result, the project will approach the integration of climate change mitigation activities into development planning in Afghanistan with an incremental bottom-up approach that can be sustained through replication and upscaling of successful practices.

The project will also emphasise the involvement of diverse social groups within local communities, including prioritising of activities that can be implemented by women. Considering that women are primarily responsible for activities relating to biomass fuel use, including collection of fuel, cleaning and operating stoves etc., the project's activities have been designed to respond to the needs of women as users. For example, examples from previous biogas projects have demonstrated the need to select appropriate systems that can be easily operated and maintained by women¹. Furthermore, experience based on the USAID Improving Livelihoods and Governance through Natural Resource Management (ILGNRM) project demonstrated the benefits of consulting women's user groups on the performance of efficient bukhari stoves, which resulted in notable improvements in ease of use and energy efficiency. Consequently, the monitoring and research of piloted technologies will include periodic consultations with women in participating communities to generate suggestions for improved designs.

The project will pilot the introduction of sustainable forestry and natural resource management practices with the objective of reducing GHG emissions. However, the project will be built to integrate climate change mitigation objectives into the ongoing activities of baseline projects which include an explicit focus on supporting socio-economic development and adapting to the impacts of climate change. Consequently, the project's GHG mitigation targets will be delivered using approaches to forestry and NRM that generate direct and indirect benefits to the livelihoods and wellbeing of local communities. Reforestation and forest regeneration activities will focus on the use of tree and plant species that generate useful or commercially valuable products. Improved rangeland management will increase the productivity and household income from livestock husbandry. Restoration of degraded forests, rangelands and watershed areas will reduce the vulnerability of local communities to climate change-related hazards such as landslides. The project's activities will be implemented in coordination with UNEP, particularly through the UNEP-led "Building Environmental Resilience in Afghanistan" initiative and as a result will benefit from the experience and capacity built by this project to deliver socio-economic benefits through strategic investments in environmental resilience.

Global Environmental benefits

¹ BORDA, pers. comm.

During the implementation phase, the main global environmental benefits of the project's activities will be to reduce net GHG emissions of Afghanistan through introducing pilot climate change mitigation measures at a local scale. These pilot activities will: i) increase the sequestration of carbon of restored and enriched forests; and ii) reduce the rate of removal of woody biomass carbon by reducing local demand for woodfuel. In the long-term, the project will mainstream the CBNRM approach to forest management and promote the sustainable use of woody biomass energy at a provincial and national scale, resulting in sustained reductions in net GHG emissions from Afghanistan's Agriculture, Forestry and Other Land Use sector. The project will generate improved technical data on fuel-use efficiency and emissions from SBES systems that will be publicly available through the online biomass energy information system. In addition, the project will provide training to participating communities and district officials on monitoring and undertaking inventories of forested areas to generate baseline data for AFOLU emissions. As a result, the project's activities will establish benchmarks that will allow accurate calculation of GHGs emitted and sequestered as a result of AFOLU activities, particularly in the context of CBNRM and SBES. The improved availability of baseline emission data will allow for improved monitoring and tracking of GHGs, both for the purposes of supporting national inventories of GHG emissions but also for informing future projects with climate change mitigation targets.

Food security

In addition to restoring forests, the project will distribute diverse multi-purpose trees that generate edible or commercially valuable products (for example, *Chirgozha* pine nuts, pistachio, wild almonds). In addition, the project's activities will indirectly support other livelihood-generating activities such as apiculture. Furthermore, species will be selected that increase the availability of fodder for livestock, thereby increasing the productivity of livestock at a household scale. Sustainable forestry initiatives will also improve dry season water flows by assisting infiltration of rainwater and snowmelt. As a result, the introduction of improved forestry and land management practices will increase the availability of irrigation water, thereby improving crop production potential. Furthermore, the project's activities will indirectly support agricultural productivity and food security by generating composted animal manure in biogas digesters, which can be used as fertiliser on nearby agricultural fields. Representatives of CDCs will be provided with training on the operation and maintenance of biogas digesters, including information on the uses of slurry generated as a by-product of the digesters.

Gender equality and participation

The implementation of certain activities of the project will be particularly reliant on the active participation of women. Lessons learned from previous projects emphasised that biogas digesters must be designed so that female members of the household are physically able to operate the equipment. The project will trial the updated biogas digesters designed and distributed by BORDA, which have been specifically designed to be easily operated by women. The management of these biodigesters will also take into consideration the differing roles of women within Afghan cultural context. Lessons learned from BORDA suggest that an empathy for the cultural context is fundamental to the successful implementation of these systems. Furthermore, as women are primarily responsible for the collection of fuel wood, and the operation of household cooking and heating systems, their active participation in the selection and improvement of these systems will benefit the efficacy of project activities. Previous SBES projects have achieved significant improvements in stove efficiency and ease of use by engaging women's user groups in the design of modified SBES (e.g. the USAID-funded project "(ILGNRM)"). Therefore, the project will prioritise the involvement of women in the selection, testing and improvement of piloted SBES systems.

5.2 ENVIRONMENTAL SUSTAINABILITY

The approach is inherently focused on generating sustainable environmental benefits through restoration and enrichment of forest and rangeland areas and reducing the rate of removal of woody biomass. The methods and strategies used in this project will also be conveyed to district and local-level institutions so that the knowledge will remain within the targeted communities beyond project implementation. CDCs and FMCs will be the prioritised vehicles for institutional knowledge building. The project will mainstream the CBNRM approach into local development planning, which will

include the establishment of sustainable management plans for natural resources such as forest and rangeland areas. The results of the implementation of these plans will demonstrate the value of CBNRM and motivate for its continued practice. The project will include UNEP as an implementation partner, thereby benefiting from their experience and technical expertise. In particular, the project will build on UNEP's BERA initiative as a baseline project and will build on the environmental and social safeguards mainstreamed through the latter project. Furthermore, the project's beneficial impacts on water resources will support existing and future investments in micro-hydro electricity, both by increasing the base flow of surface waters but also by reducing the rate of sedimentation caused by soil erosion.

5.3 FINANCIAL AND ECONOMIC SUSTAINABILITY

The project will engage with national institutions and ministries, NGOs already operating on the ground, and district officials and local communities. This wide stakeholder engagement will facilitate the development of a strong sense of national ownership of project outcomes.

By promoting private sector involvement through development and marketing of local low-technology systems, and providing training to local artisans to build, sell and install SBESs in local markets, a local value chain will be established to support long-term economic sustainability. Training will include business and entrepreneurial skills transferred, such as market identification, product design, adding value, basic accounting and customer services. These skills will help minimise the failure risk of new business units. Skills transfer and capacity building will allow value to be created at source, thereby drawing income to rural communities. This will reduce their dependence on basic, unprocessed natural resources, and therefore reduce the pressure placed on these resources. This will not only build their resilience to economic downturns, but also to climate shocks. It will also decrease migration to urban areas, as rural communities will be able to produce enough income to sustain themselves.

The project will raise the awareness of policy-makers and private sector investors of the combined benefits of a low-carbon development approach for Afghanistan through the integration of SBESs and alternative energy systems into the national energy production mix. These benefits include the capacity to access international funds through REDD+ and carbon markets, as well as the enhanced climate change adaptation capacity resulting from CBNRM and its direct effects on improved rural livelihoods and increased community resilience. In particular, the project will develop a roadmap with clear milestones towards increasing investments in SBES and sustainable approaches to NRM, such as accessing finance from carbon markets and PES. The project will focus on increasing national capacity to access international funds through sources such as REDD+/ARR projects, as well as funding allocated to dedicated finance streams such as GEF and Green Climate Fund (GCF).

5.4 SUSTAINABILITY OF CAPACITIES DEVELOPED

The project will be implemented using the local-level capacities developed by the NABDP. The successful approaches demonstrated by the project will be mainstreamed into local development planning and used to raise the awareness for SBES and NRM. Capacities built by the NABDP will be leveraged through training trainers to further build capacities within their own as well as neighbouring communities.

The project will benefit from the experience in training and engaging communities by aligning with the ongoing activities of MADERA, BORDA and UNEP, all of whom have extensive experience in NRM, SBES and rural development in Afghanistan. For example, the inclusion of BORDA's approach to training of local artisans and technicians to install and repair biogas digesters will ensure that the project establishes sustained capacity to operate, maintain and promote SBES at local levels. The influence of the abovementioned stakeholders will support the integration of their collective knowledge and understanding of implementing projects in Afghanistan.

The project will emphasise the building of capacity within participating CDCs to design and implement context-specific CBNRM planning, including through the promotion of SBES. At the suggestion of consultations held during the PPG phase, the project's approach to trialling new techniques and approaches in pilot areas will rely on demonstration of concepts through well-regarded community leaders. The capacity of these community leaders will be built as a priority in order to encourage broader 'buy-in' of technologies and approaches demonstrated by the project.

5.5 APPROPRIATENESS OF TECHNOLOGY INTRODUCED

The technologies to be piloted by the project will be selected based on the successes and failures of previous projects that have promoted SBES and similar technologies in Afghanistan. Previous projects which have provided learning examples and identified appropriate SBES technologies include the UNEP-Finland Koh-e-Baba initiative, the USAID-implemented ILGNRM project, and the ongoing activities of BORDA and MADERA. These approaches will be verified in the broad and multi-level stakeholder consultations. This will assist in avoiding implementing activities that may not be appropriate in differing regions of Afghanistan's diverse forests and rangelands.

During the PPG phase, stakeholders noted that several previous biogas projects were challenged as a result of inappropriate design features for the Afghanistan context. In particular, it was noted that previous biogas projects have sometimes relied on technologies and design features developed in other countries or regions, and as a result the technologies introduced were either inappropriate for end user needs or did not perform according to technical expectations. This project will promote and disseminate the biogas digester designs developed by BORDA, which have been steadily improved based on the experiences of over two decades of implementing biogas projects. As a result the biogas systems to be piloted have previously been demonstrated successfully in other provinces of Afghanistan and are considered to be appropriate for local climate. It was noted that the performance of biogas digesters is notably reduced under low temperatures, and as a result the project will also include detailed training activities to assist communities to operate their biogas digesters during the colder winter months. Measures which may improve the productivity of biogas digesters include the installation of small plastic 'greenhouse' covers, as well as pre-warming of feedstock and water to be added to the digesters.

The second SBES that will be piloted by the project, specifically the efficient *bukhari* stove, is considered to be particularly appropriate for the Afghanistan context in consideration of the widespread popularity and traditional reliance on *bukharis* for cooking, boiling water and heating households during winter. During the PPG phase, several designs of efficient biomass stoves were considered (e.g. the Ghanaian 'Toyola' model). However it was proposed by stakeholders during the PPG phase that the majority of 'traditional' efficient cookstove designs would be inappropriate in Afghanistan because it was perceived as unlikely that households would be willing to adopt new styles of cooking and household heating. The project will pilot the style of efficient cookstoves promoted by the USAID ILGNRM and efficient *bukhari* heaters promoted by the SHELTER project. The latter SBESs have been developed in close consultation with household stove users, including several improvements to the design based on user recommendations. Consequently, the SBES technologies that will be piloted by the project have previously been demonstrated in Afghanistan and have been refined to reflect the needs and existing capacity of participating households.

REPLICABILITY AND SCALING UP

The project will engage academics from the Universities of Kabul and Jalalabad in the monitoring and improvement of technical performance of SBES, thereby generating data and information to inform other related initiatives. The project will emphasise the generation of knowledge products, including theses and peer-reviewed scientific literature. As replicability is a principle of generating scientific research, this rigorous approach to analysing the impact of project activities will produce knowledge that is transferred to new projects and sites. Additionally, the project will build technical capacity to calculate fuel-use efficiency and energy conversion of SBESs. This will also provide clear reference (i.e. 'baseline') for emissions from relevant LULUCF sectors, which can be used to calculate GHG emissions and sequestrations with a high degree of technical accuracy. These emissions calculations

will support future projects that include activities related to climate change mitigation targets, carbon credits and fuel-use efficiency.

The proposed project will be piloting activities in several districts in Parwan and Nangarhar. These activities will be evaluated and replicated in other CDCs and DDAs in the respective provinces. The provincial pilot components will be implemented in close participation with Provincial MAIL representatives, who will benefit from the training and capacity-building supported by the project. As a result, the capacity build in pilot provinces will allow for successful approaches to be replicated in neighbouring districts.

Furthermore, successful interventions will be spontaneously out-scaled and replicated should their success be evident to neighbouring individuals and communities. Interventions that make use of readily available materials and tools will allow replication to take place without the need for additional projects to implement them. However, the project will still allow for a repository of knowledge to be built and be made readily available for NGO's and government departments to promote them in areas that may be too remote for spontaneous up-take.

The knowledge built during the implementation and evaluation of the project will be used to inform sustained revisions to forestry, renewable energy and natural resources policy. The project will advocate for coherent and integrated policy revisions that promote CBNRM and SBES at a national scale, so that successful approaches and technologies can be piloted on a much larger scale in the future. This component of the project will be supported by the project's engagement with the newly established Biogas Consortium of Afghanistan, which will allow for successful approaches to be shared directly with, and improved by, multiple local stakeholders with interests in biogas.

APPENDICES

APPENDIX 1: RESULTS MATRIX

Project outcomes and impacts: ⁹⁴

Table A1.1: Outcomes and impacts of the project.

Project Objective: To reduce GHG emissions by promoting community forestry, and removing barriers to sustainable biomass energy, while laying the groundwork for climate change mitigation in Afghanistan.

Objectives	Indicator	Baseline	Milestones towards achieving output and outcome targets			
			Mid-term	Final	Means of Verification	Assumptions
Objective. To reduce GHG emissions by promoting community forestry, and removing barriers to sustainable biomass energy, while laying the groundwork for climate change mitigation in Afghanistan	Quantity of GHG emissions reduced from LULUCF sector	The estimated emissions of GHGs resulting from LULUCF activities are estimated to be ~373,000 and 123,000 tCO ₂ e/year in Nangerhar and Parwan provinces, respectively. Within proposed project areas of 12,000 ha in each district, annual GHG emissions from LULUCF activities are ~5,786 and 2,477 tCO ₂ e/yr in Dara-e-Noor and Salang, respectively.	Net annual GHG emissions from LULUCF activities are reduced by 100% relative to the baseline, equivalent to ~5,786 and 2,477 tCO ₂ e/yr in Dara-e-Noor and Salang, respectively.	GHG emissions resulting from avoided deforestation/degradation, forest enrichment and establishment of woodlots reduced by 100% relative to the baseline in two (2) pilot areas of 12,000 ha each. This is equivalent to ~17,358 and 7,433 tCO ₂ e in the three years of project implementation in Dara-e-Noor and Salang, respectively.	- Comparison of land cover by analysis of satellite imagery; - Bi-annual monitoring reports submitted by International and National Carbon Monitoring Experts; - Bi-annual updates and annual reports by Technical Service Provider.	Project's activities will continue to be a priority despite possible changes in Government and political stability. Project coordination and establishment of steering committee is prioritized at the implementation phase.
	Number of households in pilot areas to adopt sustainable biomass energy systems (SBES) demonstrated and researched by the project.	Multiple previous initiatives have promoted technologies and approaches for sustainable biomass fuel use. However there is a low rate of adoption of these technologies and limited availability of data to estimate fuel use efficiency and GHG mitigation potential.	At least 230 households adopting one or more of the SBESs promoted and demonstrated in pilot areas.	At least 1920 households adopting one or more of the SBESs promoted and demonstrated in pilot areas.	- Completed assessments and academic studies on technical performance of SBESs trialled; - Financial reporting on procurement of materials for SBESs; - Bi-annual updates and annual reports by Technical Service Provider.	Budget and staff allocations from line ministries are adequate to ensure logistic and technical support. The GoIRA is committed to integrating SFM and SBES into decision-

⁹⁴ Please insert/delete rows for components as needed

	Quantity of GHG emissions reduced from biomass energy use.	Annual emissions of GHGs from biomass fuel use is estimated to be ~9.0 and 15.8 tCO ₂ e per household in Nangerhar and Parwan provinces, respectively. Within proposed project areas of ~20,000 households, annual GHG emissions from biomass fuel use is estimated to be ~179,723 and 315,911 tCO ₂ e/yr in Dara-e-Noor and Salang, respectively.	~ 2,239 tCO₂e resulting from promotion and adoption of SBES in at least ten (10) CDCs	GHG emission reductions resulting from adoption of SBESs in at least twenty (20) CDCs are estimated to be ~ 10,298 tCO₂e during the project implementation period.	<ul style="list-style-type: none"> - Bi-annual monitoring reports submitted by International and National Carbon Monitoring Experts; - Completed assessments and academic studies on technical performance of SBESs trialled; - Minutes/notes of meetings with CDC representatives; - Bi-annual updates and annual reports by Technical Service Provider. 	<p>making and policy. Policy, institutional and regulatory reform processes in the forestry and renewable energy sectors continue to receive government support at the highest level</p> <p>Relevant training and capacity building of government staff delivered in a timely manner and low turn-over of trained staff</p>
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Component 1

Outcome	Indicator	Baseline	Milestones towards achieving output and outcome targets			
			Mid-term	Final	Means of Verification	Assumptions
Outcome 1. The CBNRM approach and sustainable biomass energy systems have been mainstreamed into national policies and frameworks for renewable energy and forestry.	1.1 Number of national policies and sectoral strategies that promote CBNRM and sustainable use of biomass energy.	Community-based Natural Resource Management (CBNRM) and sustainable biomass energy systems (SBES) are noted within policies for Forestry and Renewable Energy, respectively, however, existing policies are sector-specific and uncoordinated. Furthermore, the existing national policies are not widely implemented at the sub-national level, for example, promotion of CBNRM and increasing access to SBES are not prioritised in pilot district development plans.	Strategic recommendations are provided to support implementation of integrated SBES and CBNRM planning within at least three strategic/planning documents, including the Renewable Energy Strategy and Action Plan; National Forest Management Plan; and Renewable and Rural Energy Strategy.	At least three strategic/planning documents - including the revised Renewable Energy Strategy and Action Plan; the National Forest Management Plan; and the Renewable Rural Energy Strategy - promote integrated SBES and CBNRM planning	- Policy briefs and strategic recommendations presented to sectoral decision-makers; - SBES and CBNRM included within priority activities in ANREP, RREP, NFMP, and corresponding Strategies and Action Plans.	Central, national-level stakeholders continue to commit time and resources to relevant line activities. Low rate of turnover of senior representatives and staff of stakeholder agencies. Project's activities will continue to be a priority despite possible changes in Government and political stability. The GoIRA and other stakeholders support M&E processes, and are committed to continuous learning and exchange of knowledge on SFM and SBES..
	1.2 A national roadmap to promote sustainable biomass energy systems in	At present there is no national-level promotion of integrated planning of biomass energy systems in alignment with principles of CBNRM.	Draft roadmap available for stakeholders' inputs and discussions	A roadmap for sustainable biomass energy systems in alignment with CBNRM principles that includes establishment of	Completed roadmap and presentation of roadmap recommendations to national-level policy-makers	

	alignment with CBNRM principles.	Furthermore there is no strategy to address shortfalls in funding and capacity.		milestones and deliverables, to promote investment in CBNRM and SBES.		
	1.3 Cross sectoral institutional government mechanism to promote sustainable biomass energy use.	There is a need to establish a cross-sectoral working group of stakeholders to improve coordination between ongoing initiatives, and to promote sharing of best practices, related to sustainable biomass energy and natural resource management.	<p>A cross-sectoral national-level working group on sustainable biomass energy (SBEWG) is established and meets at least twice a year.</p> <p>An annual report submitted by SBEWG on strategic recommendations to support implementation of integrated SBES and CBNRM planning within national and provincial planning and national climate change response.</p>	An cross-sectoral national-level working group on sustainable biomass energy institutionalised within government and generating annual strategic recommendations to support implementation of integrated SBES and CBNRM.	<ul style="list-style-type: none"> - Minutes of meetings by SBEWG; - Annual reports by SBEWG. 	
	1.4 Number of knowledge products available through the project's biomass energy information system.	At present there is no centralised platform for compiling and disseminating data and best-practice guidelines to support initiatives related to CBNRM and SBES.	At least one (1) technical report and one (1) popular/grey literature article publicly available through the biomass energy information system.	At least: i) two (2) technical reports and two (2) popular/grey literature article on SBES generated from Component 3; ii) two (2) policy briefs generated from Output 1.1.1; and iii) two (2) training protocols for selecting, operating and maintaining SBESs, generated under Component 3; publicly available through the biomass energy information system.	<ul style="list-style-type: none"> - Monitoring of website traffic/visitors to the biomass energy information system; - Publicly available knowledge products via biomass energy information system. 	

Component 2

	Indicator	Baseline	Milestones towards achieving output and outcome targets			
			Mid-term	Final	Means of Verification	Assumption
Outcome 2 The CBNRM approach has been incorporated in targeted areas at a district scale	2.1 Number of provincial and district-level government and CDCs with capacities to promote and implement CBNRM and SFM	<p>At present there is no training provided to MAIL and NEPA staff to promote CBNRM, and awareness of sustainable biomass-based energy systems is relatively low. There is no standard training protocol or information on CBNRM and SBES for government extension staff.</p> <p>Currently there are a total of six (6) FMCs established within pilot project districts, none of which have received training or capacity-building, and none of which have submitted or implemented CBNRM plans.</p>	<p>- One completed first draft of training toolkit for government extension officers on integrated CBNRM and SFM.</p> <p>- One completed first draft of training toolkit for households and CDC representatives on community-based approaches to NRM and SFM.</p>	<p>- At least thirty (30) government technical extension staff in pilot provinces, including at least five (5) each from MAIL, MRRD, NEPA, trained on CBNRM, principles of SFM, and promotion of SBES.</p> <p>- Representatives of at least twenty (20) CDCs are trained on establishment of FMCs and implementation of CBNRM plans in each of two (2) pilot districts.</p>	<p>- Completed training toolkit;</p> <p>- Training workshop attendance registers;</p> <p>- Bi-annual updates and annual reports by Technical Service Provider.</p>	<p>Security and stability in the pilot sites is adequate to support implementation of the project's activities.</p> <p>Local communities and representatives of local committees are willing to implement new approaches to sustainable management of natural resources.</p>
	2.2 Number of CBNRM plans developed and implemented in pilot districts.	<p>At present, CBNRM plans are not actively implemented by FMCs in pilot areas.</p> <p>At present there are five (5) FMCs established in Dara-e-Noor with management plans established across 12,000 hectares, however the status of implementation of these management plans is unknown. There is one (1) FMC established in Salang district, however at present</p>	<p>- A total of at least five (5) FMCs have developed CBNRM plans for implementation.</p> <p>- Participatory mapping of forest and other natural resources, and identification of activities to be included in CBNRM plans, undertaken by at least five (5) existing FMCs.</p>	<p>- CBNRM plans, including establishment of FMCs and forest use rights, are developed in two (2) pilot districts, and approved at CDC, district, provincial and central (MAIL) levels.</p> <p>- A total of at least ten (10) FMCs are actively implementing CBNRM plans with the support of MAIL and NEPA</p>	<p>- Maps of forest areas produced in participation with FMC members;</p> <p>- Formally registered FMCs;</p> <p>- Completed CBNRM plans submitted to MAIL;</p> <p>- Bi-annual updates and annual reports by Technical Service</p>	<p>Provincial and district-level government representatives are willing and committed to delivering the project's outcomes.</p> <p>Community representatives as well as provincial</p>

		this FMC has not submitted or implemented any planned CBNRM activities.		extension officers.	<p>Provider.</p> <ul style="list-style-type: none"> - Bi-annual updates and annual reports by Technical Service Provider; - Annual update reports from Provincial Coordination Units (PCUs) submitted to MAIL; - Inclusion of CBNRM plans in updated District Development Plans. 	<p>and district-level government staff are provided with adequate training and capacity-building.</p> <p>Low rate of turnover of experienced/skilled government staff.</p>
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Component 3

			Milestones towards achieving output and outcome targets			
	Indicators	Baseline	Mid-term	Final	Means of verification	Assumptions
Outcome 3 Innovative and sustainable biomass energy technologies tested and deployed in two pilot areas.	3.1 Increased capacity among provincial planning and governmental agencies to plan, promote and implement sustainable biomass energy projects	<p>At present there are no training programmes or toolkits to train or increase the capacity of government technical staff to design, implement and manage community-based projects related to forestry and bio-energy.</p> <p>There are no training materials or programmes focused on increasing capacity of community members to adopt CBNRM and SBES practices</p>	- Awareness-raising strategy and first drafts of two (2) training toolkits developed, targeted to the needs and capacity of SBES users, government extension staff and community members, respectively.	<p>- Two (2) updated training modules and toolkits, tailored to the specific needs and capacity of government extension staff and community members, developed and implemented.</p> <p>- A total of at least thirty (30) government technical extension staff in pilot provinces, trained on integrated planning and management of biomass energy resources, including through promotion of SBES and CBNRM.</p> <p>- At least four (4) government technical staff trained through an international 'training of trainers' programme on bioenergy through CAS.</p>	<p>- Completed training toolkit;</p> <p>- Training workshop attendance registers;</p> <p>- Bi-annual updates and annual reports by Technical Service Provider.</p> <p>- Summary presentations provided by internationally trained bio-energy experts to SBEWG and NPIU.</p>	<p>Security and stability in the pilot sites is adequate to support implementation of the project's activities.</p> <p>Local communities and representatives of local committees are willing to adopt alternative approaches to household cooking and heating..</p> <p>Provincial and district-level government representatives are willing and committed to delivering the project's outcomes.</p> <p>Community representatives as well as provincial and district-level government staff are provided with adequate training and capacity-building.</p>
	3.2 Number people with capacity in pilot areas to design, construct, market, operate and maintain	At present there are no training programmes to assist CDC members to access and adopt SBES. There is a low level of	- At least 10 CDCs , including both men and women's groups, provided with training on the benefits and	- Representatives of at least forty (40) CDCs, including both men and women's groups, will benefit from activities related to awareness-	<p>- Training workshop attendance registers;</p> <p>- Bi-annual updates and annual reports by Technical Service Provider.</p>	Low rate of turnover of experienced/skilled government staff.

	<p>SBES, as well as on practical measures to increase availability and efficiency of use of biomass.</p>	<p>awareness of the benefits of SBES (economic, environmental, health).</p> <p>Currently there are very few entrepreneurs or small-to-medium enterprises which are involved in manufacturing or promoting modern SBESs.</p>	<p>operation of SBES.</p> <p>- At least ~5 tinsmiths and ~2 masons are engaged and trained in manufacture and marketing of SBESs.</p>	<p>raising and training on the benefits and operation of SBES.</p> <p>~At least ten (10) tinsmiths and ~five (5) masons are engaged and trained in manufacture and marketing of SBESs.</p>		
	<p>3.3 Number of peer-reviewed scientific publications, policy briefs and popular articles based on the SBESs demonstrated through the project to increase awareness of benefits and technical performance of SBES.</p>	<p>At present there are no technical assessments or research outputs that report on the GHG mitigation potential and technical performance of SBES in Afghanistan.</p>	<p>One (1) independent assessment report generated on technical performance of three SBESs demonstrated, including estimates of fuel use efficiency and GHG mitigation potential.</p>	<p>At least: i) one (1) peer-reviewed scientific journal article reporting on the energy efficiency and reduced GHG emissions achieved by piloted SBES; ii) one (1) independent assessment report on SBES piloted to inform GHG tracking; and iii) one (1) policy brief on the benefits and technical performance of SBES demonstrated.</p>	<p>- Training workshop attendance registers;</p> <p>- Bi-annual updates and annual reports by Technical Service Provider.</p>	

Component 4:

			Milestones towards achieving output and outcome targets			
	Indicators	Baseline	Mid-term	Final	Means of verification	Assumptions
Outcome 4 Increased national awareness and promotion of SBES and CBNRM	4.1 Number of Awareness raising activities and communication strategy at pilot sites and at a national level.		Local awareness-raising strategy developed to be implemented within pilot districts to promote upscaled adoption of SBES and CBNRM at district-level.	- Awareness-raising activities implemented within at least twenty (20) CDCs in pilot districts to promote adoption of SBES and CBNRM. - At least two (2) popular or ‘grey literature’ articles to promote SBES disseminated through government media.	- Awareness-raising strategy implemented at district level; - Bi-annual updates and annual reports by Technical Service Provider.	The GoIRA and other stakeholders support M&E processes, and are committed to continuous learning and exchange of knowledge on SFM and SBESs.
	4.2 Number of Project-related “Best Practices” and “Lessons Learned” available in English and local languages.		At least one “best practices” report based on the first year of implementation and technical assessments of SBES.	At least two (2) “best practices” reports and two (2) policy briefs presented to NPIU and PSC to guide on best practices and lessons learned as a result of implementation.	- Completed policy briefs; - Awareness-raising strategy implemented at district level. - Awareness-raising knowledge products such as popular articles available through government websites and print.	
	4.3 Project monitoring and evaluation system operating providing systematic information on progress in meeting project outcome and output targets.		Mid-term review report on project progress, including estimated GHG emissions reduced by project. Revised workplan for Year 2 submitted by NPIU to PSC, based on mid-term report and lessons learned during Year 1 of implementation.	Terminal review report on project implementation including: - total estimated GHG emissions reduced by project; - summary adaptive management approaches introduced during the implementation period.	- Half-yearly and annual reporting by TSPs; - Annual review submitted by NPIU.	

CCM Tracking Tool

General Data		Target at CEO Endorsement	Notes
Project Title	Reducing Greenhouse Gas emissions through Community Forests and Sustainable Afghanistan		
GEF ID	5610		
Agency Project ID	623884		
Country	Afghanistan		
Region	ECA		
GEF Agency	FAO		
Date of Council/CEO Approval			Month DD, YYYY (e.g., May 12, 2010)
GEF Grant (US\$)	1 735 160		
Date of submission of the tracking tool			Month DD, YYYY (e.g., May 12, 2010)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities under the UNFCCC?	1		Yes = 1, No = 0
Is the project linked to carbon finance?	0		Yes = 1, No = 0
Cofinancing expected (US\$)	114	3 811	

Objective 1: Transfer of Innovative Technologies

Please specify the type of enabling environment created for technology transfer through this project

National innovation and technology transfer policy		Yes = 1, No = 0
Innovation and technology centre and network		Yes = 1, No = 0
Applied R&D support	1	Yes = 1, No = 0
South-South technology cooperation		Yes = 1, No = 0
North-South technology cooperation		Yes = 1, No = 0
Intellectual property rights (IPR)		Yes = 1, No = 0
Information dissemination	1	Yes = 1, No = 0
Institutional and technical capacity building	1	Yes = 1, No = 0
Other (please specify)		
Number of innovative technologies demonstrated or deployed		

3		
Please specify three key technologies for demonstration or deployment		
Area of technology 1	Energy_Efficiency	
Type of technology 1	Fuel-efficient heating and cooking stoves	specify type of technology
Area of technology 2	Renewable_Energy	
Type of technology 2	Biogas digester	specify type of technology
Area of technology 3	LULUCF	
Type of technology 3	Sustainable forest management	specify type of technology
Status of technology demonstration/deployment	3	0: no suitable technologies are in place 1: technologies have been identified and assessed 2: technologies have been demonstrated on a small scale 3: technologies have been deployed 4: technologies have been diffused widely with some commercialization 5: technologies have reached market potential
Lifetime direct GHG emissions avoided	112 476	tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	110 997	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	280 236	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	120 000	tonnes CO2eq (see Special Notes above)

Objective 3: Renewable Energy

Please specify if the project includes any of the following areas

Heat/thermal energy production	1	Yes = 1, No = 0
On-grid electricity production	0	Yes = 1, No = 0
Off-grid electricity production	0	Yes = 1, No = 0

Policy and regulatory framework	4	0: not an objective/component 1: no policy/regulation/strategy in place 2: policy/regulation/strategy discussed and proposed 3: policy/regulation/strategy proposed but not adopted 4: policy/regulation/strategy adopted but not enforced 5: policy/regulation/strategy enforced
Establishment of financial facilities (e.g., credit lines, risk guarantees, revolving funds)	3	0: not an objective/component 1: no facility in place 2: facilities discussed and proposed 3: facilities proposed but not operationalized/funded 4: facilities operationalized/funded but have not started 5: facilities operationalized/funded and have started
Capacity building	4	0: not an objective/component 1: no capacity built 2: information disseminated/awareness raised 3: training delivered 4: institutional/human capacity strengthened 5: institutional/human capacity utilized and sustained
Installed capacity per technology directly resulting from the project		
Wind		MW
Biomass		MW el (for electricity production)
Biomass	286 434,52	MW th (for thermal energy production)
Geothermal		MW el (for electricity production)
Geothermal		MW th (for thermal energy production)
Hydro		MW
Photovoltaic (solar lighting included)		MW
Solar thermal heat (heating, water, cooling, process)		MW th (for thermal energy production, 1m ² = 0.01 MW th)
Solar thermal power		MW el (for electricity production)
Marine power (wave, tidal, marine current, osmotic, ocean thermal)		MW
Lifetime energy production per technology directly resulting from the project (IEA unit converter: http://www.iea.org/stats/unit.asp)		
Wind		MWh
Biomass		MWh el (for electricity production)

Biomass	286 434,52	MWh th (for thermal energy production)
Geothermal		MWh el (for electricity production)
Geothermal		MWh th (for thermal energy production)
Hydro		MWh
Photovoltaic (solar lighting included)		MWh
Solar thermal heat (heating, water, cooling, process)		MWh th (for thermal energy production)
Solar thermal power		MWh el (for electricity production)
Marine energy (wave, tidal, marine current, osmotic, ocean thermal)		MWh
Lifetime direct GHG emissions avoided	10 297	tonnes CO2eq (see Special Notes above)
Lifetime direct post-project GHG emissions avoided	110 997	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (bottom-up)	280 236	tonnes CO2eq (see Special Notes above)
Lifetime indirect GHG emissions avoided (top-down)	120 000	tonnes CO2eq (see Special Notes above)

Objective 5: LULUCF

Area of activity directly resulting from the project

Conservation and enhancement of carbon in forests, including agroforestry	24 000,00	ha
Conservation and enhancement of carbon in nonforest lands, including peat land		ha
Avoided deforestation and forest degradation	24 000,00	ha
Afforestation/reforestation		ha
Good management practices developed and adopted	2	0: not an objective/component 1: no action 2: developing prescriptions for sustainable management 3: development of national standards for certification 4: some of area in project certified 5: over 80% of area in project certified

			0: not an objective/component 1: no action 2: mapping of forests and other land areas 3: compilation and analysis of carbon stock info 4: implementation of science based inventory/r 5: monitoring information database publicly ava
	Carbon stock monitoring system established	3	
	Lifetime direct GHG emission avoided	102 179	tonnes CO2eq (see Special Notes above)
	Lifetime indirect GHG emission avoided		tonnes CO2eq (see Special Notes above)
	Lifetime direct carbon sequestration		tonnes CO2eq (see Special Notes above)
	Lifetime indirect carbon sequestration		tonnes CO2eq (see Special Notes above)

APPENDIX 2: WORK PLAN (RESULTS BASED)

Table A2.1. Result based workplan.

[illegible]

1.4 A biomass energy information system that collects, analyses, and disseminates data on resources and technologies for sustainable energy production and utilisation, as basis for promotion of SBES in alignment with CBNRM principles.	<i>Activity 1.4.2: Undertake a review of existing methodologies for estimating energy efficiency, energy production, and GHG emissions, relevant to biomass energy systems, to establish a reporting standard and methodological approach to research technical performance of piloted SBES.</i>													
	<i>Activity 1.4.3: Research, analyse and disseminate information on the performance of piloted SBES through the biomass energy information system. Data and information on performance of piloted SBES should be packaged for dissemination in media and language tailored to the needs of the intended audiences.</i>													
	<i>Activity 1.4.4: Develop a mid- and long-term plan to sustain and upscale the biomass energy information system, including the elaboration of funding sources and identification of appropriate web-based platforms to be linked to the biomass energy information system (such as the Afghanistan Environmental Data Centre under development by UNEP, WCS and NEPA).</i>													
Component 2: Developing community-based natural resource management (CBNRM) plans and establishing community forests in 2 project areas.		FAO, MAIL, NEPA, TSP												
2.1 At least thirty (30) representatives of provincial and district-level government in pilot areas trained on CBNRM and SFM.	<i>Activity 2.1.1: Establish two Provincial Coordination Units (PCU) in Parwan and Nangarhar Provinces, including local representatives of all implementing partners and baseline projects.</i>													
	<i>Activity 2.1.2: Develop Module 1 of the updated training toolkit for governmental extension officers on integrated CBNRM and SFM principles, based on best-practice guidelines and successful approaches developed through past and ongoing related initiatives in Afghanistan.</i>													
	<i>Activity 2.1.3: Through the PCUs established in two pilot provinces, identify provincial technical staff from governmental line agencies to be included in training activities on integrated CBNRM, based on best-practice guidelines and successful approaches developed through past and ongoing related initiatives in Afghanistan.</i>													

[illegible]

	<u>Activity 3.1.6: Pilot phase 2a of SBES Demonstrations:</u> Increase distribution of two improved low-cost SBES that have been demonstrated and improved based on Pilot Phase 1a. The proposed target for Phase 2a of SBES demonstration is to: i) increase the distribution of SBES within participating CDCs by at least ten (10) households in at least ten (10) CDCs in each of two pilot areas; and ii) to expand pilot demonstrations of SBESs to at least ten (10) households in at least ten (10) additional CDCs in each of two pilot areas. i.e. increase number of households using SBES in existing participating CDCs by at least 400, and to introduce demonstrations of SBES into at least 400 households in newly participating CDCs.													
	<u>Activity 3.1.7: Pilot phase 2b of SBES Demonstrations:</u> Increase distribution of household-scale biogas digesters that have been demonstrated and improved based on Pilot Phase 2a. The proposed target for Phase 2b of SBES demonstration is to install at least three (3) digesters per participating community, in at least five (5) CDCs, in both pilot areas i.e. at least thirty (30) digesters in total.													
	<u>Activity 3.1.8: Repeat steps of Activity 3.1.4 - 3.1.6, to revise the proposed SBES portfolio and workplan and replicate the phased approach to demonstration of SBESs. Proposed targets for Phase 3a-3b of SBES demonstration include at least an additional 800 households adopting low-cost SBES and at least 60 additional households with installed biogas digesters.</u>													
	<u>Activity 3.2.1: Engage representatives of CDCs in pilot areas in consultative workshops to: i) identify primary household energy needs and priorities; and ii) introduce and demonstrate the benefits of the SBES to be promoted by the project.</u>													

APPENDIX 3: RESULTS BUDGET



Output based Oracle
budget templat tool.x

(Budget presented in ‘Output-based budget template tool, attached to this document in the above Oracle template tool)

These tables should be copied in from the Excel budget (click on icon above) deleting the two tables below only inserted for demonstration.

Component. 1: [Insert component title]	Component 2: [Insert component title]	Component 3: [Insert component title]	Component 4: [Insert component title]	Component 5: [Insert component title]
O 1.1.1: [Insert output, eventually abbreviated]	O 2.1.1: [Insert output, eventually abbreviated]	O 3.1.1: [Insert output, eventually abbreviated]	O 4.1.1: [Insert output, eventually abbreviated]	O 5.1.1 : [Insert output, eventually abbreviated]
O 1.1.2: [Insert output, eventually abbreviated]	O 2.1.2: [Insert output, eventually abbreviated]	O 3.1.2: [Insert output, eventually abbreviated]	O 4.1.2: [Insert output, eventually abbreviated]	O 5.1.2: [Insert output, eventually abbreviated]
O 1.2.1: [Insert output, eventually abbreviated]	O 2.1.3: [Insert output, eventually abbreviated]	O 3.2.1: [Insert output, eventually abbreviated]	O 4.2.1: [Insert output, eventually abbreviated]	
O 1.2.2: [Insert output, eventually abbreviated]	O 2.2.1: [Insert output, eventually abbreviated]			
	O 2.2.2: [Insert output, eventually abbreviated]			

Oracle code and description	Unit	No. of units	Unit cost	1	2	3	4	PM	GEF	Y1	Y2	Y3
5300 Salaries professionals												
National Project Coordinator (NPC)	pers/month	36	2300	0	0	0	0	82800	82800	27600	27600	27600
Administration and Financial Officer (AFO)	pers/month	36	2019	0	0	0	0	72684	72684	24228	24228	24228
Drivers (2), 2 provincial drivers to be appointed from 3rd quarter of year 1	pers/month	60	871	0	23227	29033	0		52260	17420	17420	17420
Guards (2), from 3rd quarter of year 1	pers/month	60	577	0	15387	19233	0		34620	11540	11540	11540
Provincial Field Coordinators (PFC) (2, 1 per province), from 3rd quarter of year 1	pers/month	60	2113	0	56347	70433	0	0	126780	25356	50712	50712
				0	0	0	0	0	0			
				0	0	0	0	0	0			
5300 Sub-total salaries professionals				0	94 960	118 700	0	155 484	369 144	106 144	131 500	131 500
5570 International Consultants				0								
Chief Technical Advisor (CTA)	days	90	500	13846	13846	17308	0		45000	15000	15000	15000
Carbon Monitoring Expert (CME)	days	50	500	0	11111	13889	0		25000	15000	10000	
Sustainable Biomass Energy Expert (SBEE)	pers/month	9	5000	0	0	45000	0		45000	22500	22500	
CBNRM/SFM Technical Advisor (MADERA)	pers/month	12	5000		60000	0	0	0	60000	30000	30000	
				0	0	0			0			
Sub-total international Consultants				13 846	84957	76197	0	0	175000	82500	77500	15000
National consultants				0					0			
National Capacity-building and Education Expert (NCEC)	pers/month	8	2638	0	0	0	21104		21104		10552	10552
National Institutional and Policy Expert (NIPE)	pers/month	6	2638	15828	0	0	0		15828		7914	7914
National Carbon Monitoring Expert (NSFME)	pers/month	18	2638	9497	18994	18994	0		47484	15828	15828	15828
National Knowledge Management and Communication Consultant	pers/month	9	2153	19377	0	0	0		19377	6459	6459	6459
National Renewable Energy Expert (NREE)	pers/month	18	2638	13567	0	33917	0		47484	15828	15828	15828
CBNRM/SFM Team Leaders (MADERA), (2, 1 per province) from 3rd quarter of year 1	pers/month	60	801	0	48060	0	0	0	48060	9612	19224	19224

CBNRM/SFM Extension Officers (FEO) (4, 2 per province) (MADERA), from 3rd quarter of year 1	pers/month	120	310	0	37200	0	0	0	37200	7440	14880	14880
				0	0	0	0	0	0			
Sub-total national Consultants				58269	104254	52911	21104	0	236537	55167	90685	90685
5570 Sub-total consultants				72115	189211	129107	21104	0	411537	137667	168185	105685
5650 Contracts												
Technical research and evaluation of piloted SBES	Lump sum	2	14000	0	0	28000	0		28000	14000	14000	
Research stipend for preparation of manuscripts for publication in peer-reviewed journals on performance of SBESs	Lump sum	2	5000			10000	0		10000		5000	5000
Technical services (BORDA): Capacity development and training programme on sustainable biomass energy	Annual lump sum	3	57600	0	0	172800	0		172800	57600	57600	57600
Technical services (MADERA): Capacity development and training programme on community-based NRM and SFM (25% Direct Project Cost, 25% Travel, 36% Support, 14% Administration)	Annual lump sum	3	57600	0	172800	0	0		172800	57600	57600	57600
Biomass energy information system: hosting and maintenance	Annual lump sum	2	14000	28000	0	0	0		28000		14000	14000
Construction of 1800 low-cost SBESs: i) Fuel-efficient cookstoves (FECs) and ii) Improved <i>Bukhari</i> Stoves (IBS)	Lump sum for labour	1800	25	0	0	45000	0		45000	5000	20000	20000
International Study Tour on bioenergy: tuition fees excl. travel	Tuition and course materials per person	4	2400	0	0	9600	0		9600		9600	
TSS: Two annual review reports (Years 1 & 2)	Lump sum	1	10000	0	0	0	10000		10000		10000	
TSS: Final evaluation independent consultants	Lump sum	1	30000	0	0	0	30000		30000			30000
TSS: Project-related "Best Practices" and "Lessons Learned" published.	Lump sum	1	8000	0	0	0	8000		8000			8000
5650 Sub-total Contracts				28000	172800	265400	48000	0	514200	134200	187800	192200
5900 Travel												
International staff travel (CTA, CME)	permission	9	2500	7500	7500	7500	0		22500	10000	10000	2500
TSS travel (3 missions)	permission	3	2500	2500	0	0	5000		7500	2500	2500	2500
Counterpart travel cost/DSA (30) (NEPA, MAIL, MEW, MRRD)	per/month	36	120	1329	1329	1662	0		4320	1440	1440	1440
International Study Tour: travel	Travel per person	4	2500	0	0	10000	0		10000	4000	6000	

National staff travel	pers/month	36	300	3323	3323	4154	0		10800	3600	3600	3600
5900 Sub-total travel				14652	12152	23315	5000	0	55120	21540	23540	10040
5023 Training and workshops												
Workshops for training national government stakeholders		2	2400	4800	0	0	0		4800	2400		2400
Workshops for training provincial government technical staff		4	2400	0	4800	4800	0		9600	4800		4800
Workshops for training district- and community-level representatives		20	1000	0	10000	10000	0		20000	6667	6667	6667
Training conducted for skilled workers, particularly tinsmiths, to construct and market low-cost FECs and <i>bukhari</i>		4	1500	0	0	6000	0		6000	3000	3000	
Training conducted for skilled workers, particularly builders, masons, and plasterers, to construct and market biogas digesters		4	2400	0	0	9600	0		9600	4800	4800	
5023 Sub-total training				4800	14800	30400	0	0	50000	21667	14467	13867
6000 Expendable procurement												
Material for biogas digesters (x90)	Per household	120	400	0	0	48000	0		48000	5333	21333	21333
Material for FECs (x1800)	Per household	1800	25	0	0	45000	0		45000	5000	20000	20000
Block grants for FMC activities, to be selected by FMC members. Grants can be allocated to activities including <i>inter alia</i> establishment of nurseries, purchase of seedlings, establishment of <i>Qorog</i> , establishment of woodlots and agroforestry plots.	Lump Sum	10	8505		85052				85052		42526	42526
Training programme toolkits and printed materials (national stakeholders training and policy briefs)	Lump Sum	2	250	500	0	0	0		500	250		250
Training programme toolkits (provincial stakeholders training and capacity-building)	Lump Sum	4	500	0	1000	1000	0		2000	1000		1000
Training programme toolkits (community-based users of SBES)	Lump Sum	2	1000	0	0	2000	0		2000	1000		1000
Training programme toolkits (community-based forest management committees)	Lump Sum	2	1000	0	2000	0	0		2000	1000		1000
Project 'best practices' and 'lessons learned'	Lump Sum	1	600	0	0	0	600		600			600

6000 Sub-total expendable procurement				500	88052	96000	600	0	185152	13583	83859	87709
6100 Non-expendable procurement												
Office Equipment (5 PCs, 3 Printers, 2 Cameras, 3 Internet dongles)	Lump Sum	1	4999	1250	1250	1562	937		4999	4999		
Forest management packages (GPS-enabled mobile phone, calipers, measuring tape, signposts, set square, stationery)	Lump Sum	10	1050	0	10500	0	0		10500	5250	5250	
6100 Sub-total non-expendable procurement				1250	11750	1562	937	0	15499	10249	5250	0
6300 GOE budget												
Operating costs	month/cost	36	3000	27000	27000	33750	20250		108000	36000	36000	36000
District sundries (from third quarter of year 1)	Month/ District Unit	60	442	6627	6627	8284	4970		26508	5302	10603	10603
6300 Sub-total GOE budget				33627	33627	42034	25220	0	134508	41302	46603	46603
TOTAL				154944	617352	706519	100862	155484	1735160	486352	661204	587604

APPENDIX 4: RISK MATRIX

Please use format from the “FAO Guide to the Project Cycle”

APPENDIX 5: PROCUREMENT PLAN

Please use format from the “FAO Guide to the Project Cycle”

APPENDIX 6: TERMS OF REFERENCE (TORS)

Terms of Reference

1. Project Steering Committee

The Project Steering Committee (PSC) will be the ultimate decision making body with regard to activities, institutional arrangements and other issues affecting the achievement of the project's objectives. A representative of NEPA will be invited to chair the PSC as a representative of national GEF operational focal point. The PSC will be responsible for providing general oversight of the execution of the Project and will ensure that all activities agreed upon under the GEF project document are adequately prepared and carried out. In particular, it will:

- Provide overall guidance to the project management team in the execution of the project at national and provincial levels.
- Ensure all project outputs and targets are in accordance with the Project document.
- Review, amend if appropriate, and approve the draft Annual Work Plan and Budget of the project for submission to FAO.
- Provide inputs to the mid-term and final evaluations, review findings and provide comments for the Management Response
- Ensure dissemination of project information and best practices

The PSC meetings should be held bi-annually, but the Chairperson has the discretion to call additional meetings if necessary. Meetings of the PSC would not necessarily require a physical meeting and could be undertaken electronically. A maximum of 7 months may elapse between PSC meetings. The official language of the PSC shall be English and Dari.

Invitations to a regular PSC meeting shall be issued not less than 90 days in advance of the date fixed for the meeting. Invitations to special meetings shall be issued not less than forty days in advance of the meeting date.

The PSC members will include representatives of all participating government agencies (including NEPA, MAIL, MRRD and MEW) and FAO. MADARA and BORDA should be represented on the PSC, both in the capacity of technical service providers as well as representatives of civil society. GIZ and UNEP will be invited to participate as observers and provide guidance and support to coordination where necessary. Kabul University will be invited to participate in the PSC as representatives of academia as well as a party involved in the technical research undertaken by the project.

The Secretariat

The National Project Implementation Unit (NPIU) will act as Secretariat to the PSC and be responsible for providing PSC members with all required documents in advance of PSC meetings, including the draft Annual Work plan and Budget and independent scientific reviews of significant technical proposals or analyses. The NPIU will prepare written report of all PSC meetings and be responsible for logistic arrangements related to meetings.

Chairperson

The Chairperson shall exercise the functions conferred on him elsewhere in these rules, and in particular shall:

- declare the opening and closing of each PSC meeting;
- direct the discussions at such meetings and ensure observance of these rules, accord the right to speak and put questions and announce decisions;
- rule on points of order;
- subject to these Rules, have complete control over the proceedings of meetings;
- appoint such ad hoc committees of the meeting as the PSC may direct;
- ensure circulation by the Secretariat to PSC members of all relevant documents;

- sign approved Annual Work Plans and Budgets and any subsequent proposed amendments submitted to FAO;
- in liaison with the PSC Secretariat, the Chairperson shall be responsible for determining the date, site – if appropriate – and agenda of the PSC meeting(s) during his/her period of tenure and the chairing of such meetings.

Reports and recommendations

1. At each meeting, the PSC shall approve report text that embodies its views, recommendations, and decisions, including, when requested, a statement of minority views.
2. A draft Report shall be circulated to the Members as soon as possible after the meeting for comments. Comments shall be accepted over a period of 20 days. Following its approval by the Chairperson, the Final Report will be distributed and posted on the Workspace as soon as possible after this.

Decision-making

All decisions of the PSC shall be taken by consensus.

2. National Project Director (NPD)

The Government of the Islamic Republic of Afghanistan will appoint a national coordinator for this FAO project. The National Project Director (NPD) will be designated by the national executing partner MAIL and MRRD, in consultation with the FAO Representation in Afghanistan and the LTU. The National Project Director (NPD) will be a senior staff member of the MAIL with relevant experience and sufficient time to oversee the project during its implementation. The NPD supports the project and acts as a focal point on the part of the Government. This responsibility will entail ensuring effective communication between partners and monitoring of progress towards expected results. More specifically, s/he would perform the following duties and responsibilities:

- Act as the responsible focal point at the political and policy level with other Government agencies, FAO and outside implementing agencies;
- Ensure that all Government inputs committed to the project, particularly co-financing are made available to the project in a timely manner and in accordance with the project Work Plan;
- Ensure all necessary support from Government personnel is provided to enable the project to implement all of the proposed component activities;
- Ensure that appropriate and adequate office space and utilities are provided to the national project office at MAIL compound in Kabul, and at Provincial DAIL offices in pilot project provinces, and that these offices are empowered to implement the project;
- Work collaboratively with the FAO Representation and the National Project Manager to ensure they effectively manage the project and supervise other members of the project team to perform their duties effectively;
- Facilitate signature of Agreements between FAO and Government partners, and the clearance of financial reports and other reports and correspondence in line with the project document;
- Promote the mainstreaming of project results into sectoral plans and policies;
- Ensure regular communication between the Project Steering Committee and all project partners;
- Review Annual Work Plans and Budget (AWP/B) prepared by the NPIU and provide any additional inputs before submission to FAO and the PCC for approval;
- Provide general guidance and support in the implementation of project activities and monitoring of project progress;
- Promote close collaboration between the project and relevant ongoing and planned Government initiatives, local partners and organisations and other initiatives in the region;
- Mobilise and report on co-financing from the Government;
- Perform other related duties as required.

Experience and qualifications

- University degree in agriculture, Environmental science or related field;

- Experience in planning and operating development cooperation programmes in developing countries;
- Experience in planning and operating development cooperation programmes in developing countries;
- Excellent communication skills, taking into account cultural and gender differences;
- Excellent planning and organising skills with attention to detail;
- Working knowledge of English and Dari or Pashto;
- Experience in the UN system is an advantage.

3. National Project Manager (NPM)

Background

The NPM, will be a locally recruited national selected based on an open competitive process. He/She will be responsible for the overall management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. The NPM will be tasked with the day-to-day management of project activities, as well as with financial and administrative reporting. The NPM's prime responsibility is to ensure that the project produces the planned outputs and achieves the planned indicators and indicator targets by undertaking necessary activities specified in the project document to the required standard of quality and within the specified constraints of time and cost. This will require linking the indicators to the work plan to ensure Results-Based Management.

The NPM will report to FAOR for all of the project's substantive and administrative issues. The NPM will be responsible for meeting government obligations under the project and will perform a liaison role with the Government, FAO and other UN Agencies, NGOs and other project partners.

Duties and Responsibilities

- Supervise and coordinate the project to ensure its results are in accordance with the Project Document and the rules and procedures established by FAO
- Assume primary responsibility for daily project management - both organizational and substantive matters – budgeting, planning and general monitoring of the project
- Ensure adequate information flow, discussions and feedback among the various stakeholders of the project
- Ensure adherence to the project's work plan, prepare revisions of the work plan, if required
- Assume overall responsibility for the proper handling of logistics related to project workshops and events
- Prepare, and agree with FAO on terms of reference for national and international consultants and subcontractors
- Guide the work of consultants and subcontractors and oversee compliance with the agreed work plan
- Maintain regular contact with FAO Country Office and the National Project Director on project implementation issues of their respective competence
- Monitor the expenditures, commitments and balance of funds under the project budget lines, and draft project budget revisions
- Assume overall responsibility for meeting financial delivery targets set out in the agreed annual work plans, reporting on project funds and related record keeping
- Liaise with project partners to ensure their co-financing contributions are provided within the agreed terms
- Assume overall responsibility for reporting on project progress vis-à-vis indicators in the Project Results Framework
- Undertake any other actions related to the project as requested by FAO or the National Project Director
- Act as a Secretary of the PSC and invite for meetings on behalf of the National Project Director as stated in the ToR of PSC

- Provide technical assistance and co-ordination for sustainable forest management criteria & indicators, LULUCF and REDD+ activities, integration into forest and land management plans and carbon monitoring
- Assuring technical co-ordination among consultants to be hired

Qualifications

- Proven management expertise – must be able to fluidly handle the political, technical, and people management challenges that will face the NPM on a daily basis. This is first and foremost the most important qualification.
- A university degree in Engineering, Management or Environmental Sciences or related fields;
- At least 8 years of experience in natural resource management or project/programme management;
- At least 5 years of project/programme management experience;
- Working experience with ministries, national institutions and forestry sector in Afghanistan;
- Ability to effectively coordinate a large, multi-stakeholder project;
- Ability to administer budgets, train and work effectively with counterpart staff at all levels and with all groups involved in the project;
- Strong drafting, presentation and reporting skills;
- Strong computer skills, in particular mastery of all applications of the MS Office package and internet search;
- Strong knowledge of sustainable forest management issues in Afghanistan, including the political, institutional and socio-economic contexts;
- Strong knowledge and experience on regional and international forestry strategies, programmes and implementations
- Excellent writing and communication skills in English and Dari or Pashto.

4. Admin and Finance Officer (AFO)

The AFO will be a locally recruited national selected based on an open competitive process. He/she will be responsible for the operational and logistical aspects of the project. The AFO will be responsible for the day-to-day management of project operations and with financial and administrative reporting. The AFO's primary responsibility is to ensure that the project activities specified in the project document are facilitated to the required standard of quality and within the specified constraints of time and cost.

Duties and Responsibilities

- Support the day-to-day operation of the project activities;
- Establish and organize project task forces and ensure timely provision of suitable inputs (personnel, training, equipment and supplies) including preparing initial and regular budget revisions and providing overall administrative and operational support to the project;
- Liaise with donors and government authorities as required;
- Ensure timely submission of regular project progress and implementation reports including identification of project follow up requirements and project closure including reporting;
- Ensure timely and complete information data entry into the field programme management information system (FPMIS) throughout the whole project cycle;
- Monitor the project in close collaboration with the technical officers, the assistant FAO representations and other units at headquarters and at country level;
- Monitor delivery estimates and contribute to regular reports at the request of the budget holder and NPM;
- Supervise project consultants and support staff in relation to the assigned tasks;
- Carry out financial management and supervision of project budgets on behalf of the budget holder;
- Lead, in collaboration with the NPM, the preparation of the preparation of annual work plans and budget;

- Appraisal and operational clearance of project documents, preparation of budgets and active participation in project discussions;
- Prepare detailed budgets for cash transfer requests based on the AWP/B and project account cash balance;
- Maintain the project's disbursement ledger and journal;
- Keep the financial records and regular review of the project account;
- Review the receipts and financial reports submitted by field offices and sub-contractors;
- Prepare six-monthly financial statement of expenditures;
- Prepare the personnel and services contracting and procurement documents;
- Participate in contracting and procurement processes including of submission of documentation to FAO for clearances; and
- Prepare relevant documents for internal and external financial audits.

Experience and qualifications

- University degree in Economics, Finance Management or a related field;
- A minimum of 5 years' experience working in one of the above fields;
- Experience managing the administration and finances of large projects;
- Excellent communication skills;
- Excellent planning and organising skills; accurate with attention to detail;
- Able to work as part of a multi-national team;
- Working knowledge of English and Dari or Pashto;
- Experience in the UN system.

5. Provincial Field Coordinators (PFC)

The two Provincial Field Coordinators (PFCs) will be locally recruited nationals selected based on an open competitive process. They will report to National Project Manager (NPM) and assist the NPM in the coordination of the FAO-GEF project in pilot provinces. The PFCs will oversee project implementation at field level including procurement, recruitment and operations logistics. In addition, they will assess support requirements against project objectives and operating environment.

Duties and Responsibilities

- Assist the NPM in managing project staff and consultants working at field sites and ensure that their reports and results are delivered on time;
- Assist the NPM to prepare GEF quarterly project progress reports, as well as any other reports requested by the Executing Agency and FAO;
- Act as NPM in case of his/her absence;
- Overall, provide all necessary support to the NPM in field implementation of the project;
- Provide general administrative support to ensure the smooth running of the Field Offices;
- Monitor the use of non-expendable equipment (record keeping, drawing up regular inventories);
- Provide technical assistance and co-ordination for capacity building activities at field sites on carbon-focused forestry activities and sustainable forest and land management.

Experience and qualifications

- University degree in Engineering, Management or Environmental Sciences or related fields;
- A minimum of 5 years' experience in the area of implementation of natural resources management projects at small and medium scale in the field;
- Experience working with local communities, preferably in the CBNRM context;
- Extensive experience of planning and reporting on international funded projects;
- Good secretarial skills and good organizational capacity;
- Good computer skills in common word processing (MS Word), spread sheet (MS Excel), and accounting software;
- Appropriate English and Dari language skills, both spoken and written.

6. Chief Technical Advisors (CTA)

The Chief Technical Advisor (CTA) will be responsible for the technical backstopping of the project's activities, particularly with respect to CBNRM, dissemination of SBESs, and appropriate techniques and methodologies for monitoring the project's targets related to climate change mitigation and GHG emission reductions. S/he will provide on-going support to the project for i) adaptive management; ii) best practice assessment; and iii) implementation to enable the project to maintain strategic direction by helping project management remain focused on overall results in addition to the day-to-day implementation concerns. This includes emphasizing a learning and adaptive approach to project management and implementation in close cooperation with the national partners. The CTA will work closely with the National Project Manager to ensure timeliness, effectiveness and technical relevance of project activities. The CTA will also provide guidance and technical backstopping to the TSPs responsible for Components 2 and 3, respectively, to ensure that all deliverables and activities are aligned with the project's objectives and results-based management, as well as international best practice. S/he will work under the overall guidance of the FAO Representative and the technical supervision of the Regional Forestry Officer based in Ankara.

Duties and Responsibilities:

- Technical backstopping for all aspects of climate change mitigation, community based natural resource management, sustainable biomass energy and agroforestry including environmental awareness, education and capacity building on these aspects;
- Provide support to the National Project Manager (NPM) in implementing adaptive management by working to facilitate effective monitoring of project activities and an ongoing, reflective evaluation of the project's progress;
- Promote cross-project knowledge management and up-scaling of best practices in Sustainable Forest management (SFM)/Natural Resource Management (NRM) and assist the NPM to establish cross-project linkages related to energy efficiency schemes for local communities, where this project can learn and share lessons effectively from/with other initiatives in the region and worldwide;
- Support and facilitate project staff and Government partners by taking part in and contributing to workshops/round table discussions and conferences that tackle natural resource management and climate change mitigation issues;
- Identify, analyse and communicate lessons learnt that may be useful in design and implementation of similar projects;
- Assist the NPM – as well as supporting technical stakeholders such as TSPs and International and National Carbon Monitoring Experts (CME and NCME, respectively – in compiling annual project progress reports and other monitoring and evaluation report requirements;
- Establish a continuous and firm link between local communities and the project;
- Provide advice on the establishment of community forest monitoring systems and integrated forest management planning;
- Facilitate linkages with other projects on CBNRM in the region for the purpose of exchange of knowledge and experience, and applying the latest technologies in CBNRM including use and training on methodologies for monitoring forest and land use change;
- Support NPIU and technical service providers in implementing technical studies of soils and land properties, analysis of salinization and ameliorative actions, biofertilizers and biogas;
- Prepare TORs for the technical service providers on: i) capacity-building; ii) community participation; iii) implementing CBNRM; and iv) promoting SBES using the following methodologies: participatory analysis and planning, participatory monitoring and evaluation and learning and knowledge sharing;
- Any other tasks assigned by the FAO Representative.

Experience and qualifications

- Rural development specialist with hands-on experiences in community based natural resources management in a rural context and renewable energies;
- A university degree in Biology, Ecology or Environmental Sciences or related fields;

- At least 8 years of experience in community based natural resource management including participatory planning techniques, adaptive management, project monitoring and evaluation processes;
- Familiarity with climate change mitigation and integrated land-use planning in Central Asia;
- Familiarity with knowledge management systems on CBNRM;
- Good knowledge of sustainable biomass energy and agroforestry techniques, especially Central Asia;
- Good knowledge in organizing public relations, environmental awareness, education and capacity building activities;
- Familiarity with the socio-economic and political context of Afghanistan;
- Familiarity with the institutions related to forestry, agriculture and energy in Afghanistan;
- Strong interpersonal and communication, reporting and presentation skills.
- Work experience with projects funded by international donors;
- Excellent knowledge of English, both spoken and written.

7. International Carbon Monitoring Expert

The International Carbon Monitoring expert will be responsible for the design and development of monitoring techniques for forest carbon and sustainable biomass. S/he will ensure the development and implementation of appropriate carbon monitoring techniques.

Duties and Responsibilities:

- Collaborate with and guide the National Carbon Monitoring expert and CTA on the development and implementation of appropriate carbon monitoring techniques
- Assess and identify strategic synergies for Participatory Carbon Monitoring (PCM) with emerging assessment processes for biodiversity, ecosystem services and REDD+ in Afghanistan and within the region;
- Examine the appropriateness of various methodologies and approaches regarding carbon such as i) compensated reductions; ii) adjusted reference levels; iii) stock flow approach; and iv) combined incentives among others to establish reference levels;
- Develop and put in place a carbon monitoring system in the context of CBNRM, including the selection of possible criteria and indicators meeting local and national monitoring needs;
- Ensure the appropriate carbon monitoring techniques and priority activities are aligned and incorporated in the Natural Resource Management plans at national level;
- Contribute to the development of training material for established FMCs to undertake participatory mapping, carbon monitoring and inventories of natural resources, particularly forests;
- Provide technical support on carbon monitoring to studies on at least two of the three piloted SBES to address technical information gaps to assess the fuel use efficiency, annual energy production and reduced emissions as a result of SBES adoption;
- Collate research findings and appropriate technology innovations on integrated CBNRM and carbon monitoring and disseminated among the national and regional networks;
- Develop, in collaboration with the NCM expert, a road map including a long-term strategy to i) continue monitoring carbon emissions from the pilot district to eventually upscale to provincial and national level; and ii support national policies and REDD+ actions; and

Experience and qualifications

- Post-graduate qualification related to Forestry Management, Environmental Sciences, Biology or related field;
- Familiarity with the institutions related to forestry, agriculture and energy in Afghanistan;
- Excellent knowledge on carbon monitoring techniques;
- Experience with participatory approaches to biodiversity and forest monitoring, including indicator selection, data collection and management;
- Experience working with local communities, particularly in the context of CBNRM;
- Familiarity with the socio-economic and political context of Afghanistan;

- Demonstrated experience in delivering capacity building, preferably in a developing country context;
- Demonstrated ability to work under limited supervision and to take initiatives;
- Experience developing training programmes on carbon monitoring;
- Strong interpersonal and communication, reporting and presentation skills;
- Previous working experience for the UN or another relevant international organization is an advantage;
- Excellent knowledge of English, both spoken and written.

8. National Carbon Monitoring Expert

The National Carbon Monitoring Consultant will be locally recruited and will report to the National Project Manager (NPM). The NCM will be responsible to provide input to the implementation of a carbon monitoring system within the local context.

Duties and Responsibilities:

- Collaborate closely with the International Carbon Monitoring Expert on the design and implementation of appropriate carbon monitoring technologies in the selected regions in Afghanistan;
- Contribute to the review of existing SBES methodologies in Afghanistan for estimating energy effects, energy production and a reduction in GHG emissions;
- Prepare a list of indicators to monitor forest carbon;
- Ensure that the developed and implemented carbon monitoring systems are aligned and consistent at national level;
- Provide input on carbon monitoring for the development of a SBES roadmap aligned with national policies and CBNRM principles;
- Contribute to the research, analysis and dissemination of the performance of piloted SBES through the biomass energy information system;
- Ensure, with the International Carbon Monitoring Expert and Technical Service Providers (TSPs), that FMCs undertake participatory mapping, periodic carbon monitoring and inventories of natural resources;
- Prepare and present an updated portfolio and workplan on the carbon monitoring approaches in alignment with the developed biomass energy road map;
- Develop PCM data collection and management protocols/manuals, providing a step-by-step instruction to field data collection teams and local data managers.

Experience and qualifications

- University degree in Environmental Sciences, Forestry, Biology or related field;
- Familiarity with the institutions related to forestry, agriculture and energy in Afghanistan;
- Excellent knowledge on carbon monitoring techniques and biomass energy;
- Experience working with local communities, particularly in the context of CBNRM;
- Strong interpersonal and communication, reporting and presentation skills;
- Work experience with projects funded by international donors;
- Excellent knowledge of English and Dari languages, both spoken and written.

9. Sustainable Biomass Energy Expert (SBEE)

The Sustainable Biomass Energy Expert will be responsible for the overall design and development of biomass energy in the project areas. The SBEE will work together with the NREE and report to the NPM.

Duties and Responsibilities:

- Assess the suitability, technical performance and cost-effectiveness of piloted SBES technologies and propose revisions to the workplan and portfolio;

- Review existing methodologies and best-practices for estimating energy efficiency, energy production, and GHG emissions, relevant to biomass energy systems, to establish a reporting standard and methodological approach to research technical performance of piloted SBES;
- Provide technical input to the development of i) a training toolkit for households on SBES; and ii) a pilot training programme on efficient use of woody biomass fuel; and iii) a pilot training programme on displacing woody biomass by alternative renewable energies;
- Support the implementation of two SBES in two pilot areas;
- Collate research findings and provide information on i) gaps to assess the fuel use efficiency, annual energy production, and reduced emissions, as a result of SBES adoption; and ii) improve the design of piloted SBESs, particularly with respect to user-friendliness and energy efficiency to be disseminated through the biomass energy information system;
- Provide technical input to the research topics for two post-graduate students;
- Contribute to specialised training on SBES for local engineers and governmental agencies.

Experience and qualifications:

- Post-graduate degree in Environmental Sciences, Forestry, Biology or related field;
- 5 years' experience in developing biomass energy techniques, preferably in Central Asia;
- Familiarity with the institutions related to forestry, agriculture and energy in Afghanistan;
- Good knowledge of sustainable biomass energy techniques, especially in Central Asia;
- Experience working with local communities, particularly in the context of CBNRM;
- Strong interpersonal and communication, reporting and presentation skills;
- Demonstrated work experience with projects funded by international donors;
- Excellent knowledge of English, both spoken and written.

10. National Renewable Energy Expert

The National Renewable Energy Expert will work closely with the Sustainable Biomass Energy Expert to develop and implement a sustainable biomass energy system. The main task of the NREE is to provide input and assistance with the development of renewable energies. More specifically, the NREE will:

- Provide input to the development of a roadmap to integrate SBES and CBNRM at a national level;
- Review existing methodologies for estimating energy efficiency, energy production, and GHG emissions, relevant to biomass energy systems, to establish a reporting standard and methodological approach to research technical performance of piloted SBES;
- Ensure implementation of two SBES in two pilot areas, including a CBNRM approach;
- Ensure the renewable energy interventions are aligned across levels and appropriate to the local context;
- Provide technical input to revise the proposed SBES portfolio and workplan;
- Provide technical input to the development of i) a training toolkit for households on SBES; and ii) a pilot training programme on efficient use of woody biomass fuel; and iii) a pilot training programme on displacing woody biomass by alternative renewable energies;
- Contribute to technical studies to address gaps on energy production and reduced emissions in participation with KURE and Implementing Partners;
- Contribute to the training programme of local engineers and entrepreneurs on the design and construction of SBES;
- Contribute to the updating of the training toolkit on SBES based on the pilot projects.

Experience and qualifications

- University degree in Environmental Sciences, Forestry, Energy or related field;
- Familiarity with the institutions related to forestry, agriculture and energy in Afghanistan;
- Good knowledge of sustainable biomass energy techniques, especially in Central Asia;
- Experience working with local communities, particularly in the context of CBNRM;
- Strong interpersonal and communication, reporting and presentation skills;

- Previous working experience for the UN or another relevant international organization is an advantage;
- Excellent knowledge of English and Dari languages, both spoken and written.

11. Technical Service Provider: Promoting the demonstration and deployment of sustainable biomass energy systems (Component 3).

A technical service provider (TSP) will be appointed by the project to support implementation of the project's activities under Component 3 in participation with provincial- and district-level government extension staff. The TSP will be a non-governmental organisation (NGO) or private consulting firm with local representation in Afghanistan and sufficient administrative and logistic support (e.g. local office facilities, adequate financial and administrative staff to support communication and reporting of project activities, drivers and vehicles to support transport etc.) to support implementation as well as administration of the project's field-based activities. The TSP should also include experienced and qualified technical staff with extensive expertise related to capacity-building and demonstration of sustainable biomass energy systems.

In particular, the TSP will be responsible for the development and implementation of activities related to capacity building and training of local communities and government representatives, respectively, to support the demonstration and deployment of Sustainable Biomass Energy Systems (SBES) and efficient domestic use of biomass fuel. The TSP will be responsible for the delivery of associated training toolkits for local communities and government extension workers, respectively, to be developed and improved iteratively over the project implementation period.

The TSP will work in close collaboration with the Sustainable Biomass Energy Expert (SBEE) and National Renewable Energy Expert (NREE) to ensure the timeliness, effectiveness and technological relevance of the project's outputs and activities related to sustainable domestic energy use and SBES in the project's field-based activities. Furthermore the TSP will work closely with the International and National Carbon Monitoring Experts (CME and NCME) to ensure that training programmes and dissemination of SBESs is undertaken in an approach that will support easy monitoring of GHG emission reductions as a result of the project activities.

A further role played by the TSP will include general support to the project's activities by contributing in-kind support through local administrative staff, office facilities and drivers. The TSP will also assist the project to coordinate and align with other ongoing and future initiatives by making use of the TSP's existing network of contacts and working relationships in Afghanistan.

Duties and Responsibilities:

- Engage CDC representatives in introduction workshops on household energy needs and the benefits of SBES;
- Work closely with the technical consultants – such as the SBEE, NREE, the CME and the NCME – to achieve the project's targets on SBES and GHG emission reductions using SBES;
- Provide training to government staff on the benefits of SBES and CBNRM as an approach to climate change mitigation;
- Undertake training, based on the input from the Sustainable and Renewable Energy experts, on i) the efficient use of woody biomass fuel; and ii) adopting alternative renewable energies as a replacement of woody biomass;
- Provide training to selected artisans and entrepreneurs to manufacture SBES;
- Provide training to selected tinsmiths to construct FECs and IBSs and their benefits;
- Provide training to selected masons and bricklayers to construct biogas digesters;
- Provide training to representatives of provincial planning agencies to plan and implement sustainable biomass energy projects;
- Develop a toolkit, including a training manual for government extension staff, based on their specific capacity needs, to replicate the training in other districts and provinces;

- Develop a training manual for local communities and households based on their specific capacity needs regarding Sustainable Biomass Energy Systems, to replicate in other districts and provinces;
- Coordinate training of national staff for a “training the trainer” course, including participation in international training programmes at Chinese Academy of Sciences (CAS).
- Provide administrative and logistical support using access to the TSP’s offices, drivers and administrators to facilitate project implementation;

Experience and qualifications:

- Extensive experience and track record of implementation of related initiatives in Afghanistan;
- Extensive experience in the field of SBES and/or renewable energy, preferably in Afghanistan as well as elsewhere internationally;
- Demonstrated experience in capacity building and developing training and workshop materials, preferably in a developing country context;
- Good knowledge of sustainable biomass energy techniques, especially in Central Asia;
- Specific expertise and experience in the SBESs to be demonstrated by the project, including biogas digesters and efficient stoves;
- Experience working with government and local communities, particularly in the context of CBNRM;
- Demonstrated experience in developing training and workshops materials, particularly for local communities;
- Strong communication skills and experience of presenting complex technical information in an easily comprehensible way for non-specialists;
- Existing MoU with one of the government ministries participating in the project;
- Excellent knowledge of English and Dari languages, both spoken and written.

12. Technical service provider: Support capacity development on CBNRM and SFM (component 2).

A technical service provider (TSP) will be appointed by the project to support implementation of the project’s activities under Component 2 in participation with provincial- and district-level government extension staff. The TSP will be a non-governmental organisation (NGO) or private consulting firm with local representation in Afghanistan and sufficient administrative and logistic support (e.g. local office facilities, adequate financial and administrative staff to support communication and reporting of project activities, drivers and vehicles to support transport etc.) to support implementation as well as administration of the project’s field-based activities. The TSP should also include experienced and qualified technical staff with extensive expertise related to capacity building and demonstration of community-based natural resource management (CBNRM) and sustainable forest management (SFM).

In particular, the TSP will be responsible for the development and implementation of activities related to capacity building and training of local communities and government representatives, respectively, to support the capacity development of CBNRM and SFM. The TSP will be responsible for the delivery of associated training toolkits for local communities and government extension workers, respectively, to be developed and improved iteratively over the project implementation period.

It is anticipated that the TSP will undertake delivery of technical outputs related to CBNRM and SFM through the coordinated efforts of multiple individual, comprising locally-based staff of TSP or externally contracted experts as necessary. The work of the TSP in each of the two pilot provinces will be coordinated through a dedicated Team Leader (TL) and two Forest Extension Officers (FEO), who will be primarily responsible for coordinating and providing technical guidance to government extension officers and members of participating communities. Furthermore, the TSP will appoint an appropriately qualified Forestry Technical Advisor (FTA) to oversee the technical relevance and alignment with international best practice of the project’s activities related to CBNRM and SFM. The project budget has included specific allocations for each of these individual consultants and project staff and can consequently undertake the procurement and contracting of these staff internally if the TSP is unable to identify appropriately qualified individuals

In addition, the TSP will work closely with the International and National Carbon Monitoring Experts (CME and NCME) to ensure that training programmes and implementation of activities related to CBNRM and SFM are undertaken in an approach that will support easy monitoring of GHG emission reductions as a result of the project activities.

A further role played by the TSP will include general support to the project's activities by contributing in-kind support through local administrative staff, office facilities and drivers. The TSP will also assist the project to coordinate and align with other ongoing and future initiatives by making use of the TSP's existing network of contacts and working relationships in Afghanistan.

Duties and Responsibilities:

- Work closely with the technical consultants – including the CTA, Forestry TA, CME and the NCME – to achieve the project's targets on implementation of CBNRM/SFM and associated GHG emission reductions;
- Undertake participatory workshops with representatives of District Development Authorities (DDAs) and Community Development Councils (CDCs) to identify willing communities;
- Develop a training programme for extension officers of the government, based on their specific capacity needs and best-practice guidelines through past and ongoing initiatives in Afghanistan;
- Support training to local communities to establish Forest Management Committees (FMCs) within CDCs;
- Provide training to established FMCs to i) identify priority activities within the proposed CBNRM plans on degraded forests and rangelands; ii) the establishment of nurseries and woodlots; and iii) undertake participatory mapping of natural resources;
- Coordinate with district- and provincial-level extension officers to increase the capacity of communities to design and implement decentralised CBNRM and SFM management plans;
- Develop a training toolkit, including a training manual for government extension staff, based on their specific capacity needs, to replicate the training in other districts and provinces;
- Develop a training toolkit, including a manual, for local communities and households based on their specific capacity needs regarding design, implementation and monitoring of CBNRM and SFM – to be replicated and upscaled in other districts and provinces;
- Provide administrative and logistical support using access to the TSP's offices, drivers and administrators to facilitate project implementation;

Experience and qualifications:

- Extensive experience and track record of implementation of related initiatives in Afghanistan;
- Extensive experience in the field of CBNRM and SFM, rural development, and capacity-building of both government and communities, preferably in an international arena in/for developing countries as well as specific experience in Afghanistan;
- Demonstrated experience in capacity building and developing training and workshop materials, preferably in a developing country context;
- Experience working with government and local communities, particularly in the context of CBNRM and SFM, preferably in Central Asia;
- Experience in developing training and workshops materials;
- Strong communication skills and experience of presenting complex technical information in an easily comprehensible way for non-specialists;
- Existing MoU with one of the government ministries participating in the project;
- Excellent knowledge of English and Dari languages, both spoken and written.

APPENDIX 7: OVERVIEW OF BIOMASS FUEL USE IN AFGHANISTAN, AND LESSONS LEARNED FROM RELATED INITIATIVES

Traditional methods of biomass fuel use in Afghanistan

The traditional methods of biomass energy use in Afghanistan households differs widely between provinces, largely as a function of climate, fuel availability, preferred cooking methods and household income. In general, whichever system is dominant in a particular region is designed to address multiple energy needs in one system, including cooking, warming water and heating the interior of the household. Consequently, it is imperative that any initiative which aims to introduce new approaches and technologies for household energy use is informed by a detailed understanding of the multiple energy needs and constraints in the local context. Efforts to reduce household energy use for specific applications e.g. cooking, are unlikely to be sustained if the promoted technology/approach does not include consideration of other household energy needs. Furthermore, initiatives which aim to promote the adoption of alternative fuel use habits also need to consider aspects such as architecture, building materials and other factors which influence the household's heating requirements.

7.1 Traditional methods of household heating and cooking

In general, the majority of traditional domestic heating system of Afghanistan are derived from one of the following three methods^{1,2}:

- *Tabakhana*: This is a system of under-floor heating which transfers heat to the household by diverting hot air through a series of sub-floor channels. In the *tabakhana* system, a cooking fire is built in a *tanur/tandoor* oven or a similar form of under-floor firepit oven. The draft which draws air through the fire flows through a narrow *muri* tunnel, which is a winding channel of stone-filled trenches beneath the floor. The gases and fumes from the fire are finally evacuated from the house through an external chimney installed in the wall. Additional measures which may be included in the *tabakhana* to improve the even transfer of heat into the household includes covering the *tandoor* pit with a large stone or metallic covering, and spreading a thin layer of ash over the warm coals to ensure a slow dissipation of the fire's heat.
- *Sandali*: The *sandali* heating method is common in several areas in Afghanistan, including in the Central Highlands Provinces such as Parwan. In this system, a fire is built in a small sub-floor pit or alternatively in a removable charcoal brazier. The ashes of the fire are covered by a low table, which in turn is covered with blankets or sheets. Members of the household will gather around the *sandali* and wrap themselves in the blankets used to cover the table.
- The *sandali* method of household heating is relatively cheap and can use multiple fuels. However, there are several disadvantages to the system, most important of which are the health risks of inhalation of poisonous carbon monoxide as well as other particulate smoke compounds. Furthermore, *sandal* systems may be a fire hazard and can cause burn injuries³.
- *Stoves*: There are several styles of iron stoves which are commonly used for cooking and heating, varying in design and application between regions. Depending on the availability of local materials and tools, iron stoves may alternatively be short-lived items made from thin sheet metal which can easily be worked using basic tools, to long-lived and durable items made from cast iron or thicker grades of steel that require brazing and welding. The size and diversity of uses of these stoves is variable, where some of the more elaborate systems may include multiple compartments

¹ Shakoor Raji, A. (1987). Traditional domestic heating in Afghanistan. Boiling Point No. 13 - August 1987. www.nzdl.org

² Narayanan, A.M. (2010). Space heating and cooling. Energy Management Center. Department of Power, Government of Kerala, India. http://www.sari-energy.org/PageFiles/What_We_Do/activities/SAWIE

³ International Committee of the Red Cross (2009). Feature: Afghanistan: Sandali stoves, a blessing and a curse. <https://www.icrc.org/eng/resources/documents/feature/2009/afghanistan-feature-230109.htm>

for drying wood, heating water and separation of fuel and ash. Metal stoves may include features which allow for baking inside the stove as well as heating of cooking pots and water on the stove top.

- An important style of stove is the *bukhari* heater, which is a highly effective household heater based on an upright cylindrical or square stove with a large metal chimney flue. However, in some areas the *bukhari* is mainly used by wealthier households while poor households remain reliant on open fires and *sandal* systems and cannot afford the high price of woodfuel to supply the *bukhari*.

A detailed assessment of traditional methods of heating and cooking was undertaken in Badakhshan province¹. This high altitude (2,000-4,000masl) area is characterised by severe and extended winters, and as a result the need for household heating is the most significant driver of household energy needs. The systems employed in this area are designed to allow for multiple cooking purposes as well as household heating.

Tanur or *tandoor* clay oven, set at a depth of ~0.5m within the floor, are fuelled by a mix of firewood, brush and cow dung. The initial heat of the fire is used to bake *naan* flatbreads inside the oven as well as cooking of traditional dishes over a pot or wok. Once flames have died down, the remaining ashes and residual heat may be used to heat water. However, in addition to the utility for cooking and water-heating, the area surrounding the oven is traditionally the family-gathering place, where members of the household will sit to enjoy the remaining warmth. Households in this area who use the floorpit or *tandoor* systems use an estimated 10-14 tonnes of woodfuel per annum for warmth, cooking and heating of water².

Households are commonly built in a style which includes an open hole in the roof, allowing smoke from the central cooking fire to escape. The reason for this design feature is to allow for smoke to escape from the room without the convective losses of heat that result from use of a chimney or similar ventilation structure³. However, a disadvantage of this system is that heat is quickly lost to the surrounding atmosphere and in consequence it is necessary to maintain a fire almost continuously.

7.2 Socioeconomic and environmental impacts of traditional woodfuel use

The near-universal reliance on biomass-based fuels in Afghanistan has resulted in major negative impacts on human health, household finances and environmental integrity. Among the most immediate and apparent impacts on households is the high financial costs of purchasing firewood, dung and other household fuels. While the price of woodfuel varies widely according to availability and seasonal demand, in some particularly poor areas households have reported spending up to ~80% of annual income on household fuel⁴. In 2007 it was estimated that the average rural household spent ~USD240-340 to meet their annual energy needs⁵.

In cases where households undertake the collection of woodfuel from nearby farms, forest and rangeland, the increasing scarcity of woody biomass results in increased time and labour spent on woodfuel collection. In consequence, women and children are diverted from other productive tasks such as farm labour, schoolwork or even simply recreation.

The other major impact of traditional biomass fuel use is the negative effect on human health, particularly for women (who are mainly responsible for cooking and tending to the fire) and children in the homestead. Of particular concern is the risk of damage to lungs and eyes arising from inhalation of soot and other particulate matter, as well as the potential risk of poisoning from carbon monoxide

¹ Nienhuys (2009). Cooking Stoves in Afghanistan Badakhshan.

http://www.hedon.info/docs/Nienhuys_AfghanistanEnergy_March09.pdf

² *ibid*

³ *ibid*

⁴ Nienhuys (2012). Improved Cooking Stove (ICS). Saving 50% Cooking Energy with a Metal ICS. Examples from Tajikistan, Pakistan and Afghanistan. Technical Working Paper 10.

http://www.nienhuys.info/mediapool/49/493498/data/HA_TechWorkPaper-10_ICS_April_2012_.pdf

⁵ Household Energy Network (2007). Household energy in Afghanistan. HEDON Network.

<http://www.hedon.info/HouseholdEnergyInAfghanistan&highlight=afghanistan>

inhalation¹. Children are generally the worst affected by the impacts of smoke exposure and inhalation, and the need to seek medical attention may contribute further to the financial burdens on the household².

7.3 Approaches to increasing the efficiency of biomass fuel use in Afghanistan households

As a result of the complex approaches to household energy use, which incorporate several energy functions and fuel types within an integrated system, multiple studies and assessments have noted that efficient cooking technologies are an inadequate strategy for reducing fuel use if applied in isolation without consideration of the total household energy needs³. For example, ‘rocket’-style cooking stoves are comparatively efficient as a cooking system but are unlikely to be used throughout winter as the transfer of heat from these systems is inadequate for households’ winter heating needs. Therefore, the introduction of an improved or efficient cooking system should include at least some investments in training and awareness-raising on the complementary approaches to improving household energy efficiency, such as investments in household insulation, passive solar architecture etc. Furthermore, the most appropriate design and technology to be demonstrated should be selected with careful consideration of the inter-annual energy requirements throughout the extremes of summer and winter. Finally, it is probable that communities will be more supportive of a technology or approach which can meet multiple energy needs, particularly with respect to cooking and household heating.

Preliminary analysis indicates that the most significant savings in household energy consumption could be achieved through improving household insulation and architecture while simultaneously increasing the efficiency of biomass energy use. This integrated approach to energy use efficiency can be summarised as the ‘Energy Triangle’, and includes: i) reducing energy needs; ii) adopting renewable energy; and iii) using energy as efficiently as possible. For example, in the case of traditional households in provinces such as Badakshan⁴ and Nuristan⁵ where the household living room features a ventilation hole in the ceiling, the inclusion of measures to cover the central ventilation hole in the roof – in combination with alternative ventilation methods – and provide additional insulation to the building’s walls and ceiling, could potentially reduce household biomass fuel use by half.

The potential to reduce household energy needs through several complementary approaches was proposed as follows⁶:

- Thermal insulation of houses – 50% reduction in space heating requirements.
- Improved cooking stoves – 40% reduction in firewood.
- Changing cooking methods – 30% reduction in firewood use.
- Use of solar energy (direct sunshine) for room heating, water heating and cooking, up to 20% reduction in energy demands.

7.4 Lessons learned from past and related work, including evaluations

Numerous previous and ongoing initiatives have provided recommendations and lessons learned that have been incorporated into the activities and approach of the GEF project. Furthermore, these initiatives have contributed to building capacity experience and have generated protocols that can be

¹ Nienhuys (2012). Improved Cooking Stove (ICS). Saving 50% Cooking Energy with a Metal ICS. Examples from Tajikistan, Pakistan and Afghanistan. Technical Working Paper 10.

http://www.nienhuys.info/mediapool/49/493498/data/HA_TechWorkPaper-10_ICS_April_2012_.pdf

² Household Energy Network (2007). Household energy in Afghanistan. HEDON Network.

<http://www.hedon.info/HouseholdEnergyInAfghanistan&highlight=afghanistan>

³ ibid

⁴ ibid

⁵ Horne (1982). “Rural Habitats and Habitations: A Survey of Dwellings in the Rural Islamic World”. In *The Changing Rural Habitat*; Volume 2: Background Papers, edited by Brian Brace Taylor. Singapore: Concept Media/Aga Khan Award for Architecture. archnet.org/publications/3588

⁶ Nienhuys (2009). Cooking Stoves in Afghanistan Badakshan.

http://www.hedon.info/docs/Nienhuys_AfghanistanEnergy_March09.pdf

applied in the field activities of the GEF project. Throughout the implementation period, the project will benefit from regular engagement with other stakeholders and ongoing initiatives in order to coordinate activities, share information and explore opportunities for collaboration. The inclusion of representatives of three line ministries as well as NEPA will further support an atmosphere of collaboration and information-sharing between representatives of the sectors of energy, rural development, climate change, and management of forests and natural resources.

In the field of off-grid renewable energy, and particularly biomass-based energy systems, several recent projects have been implemented in Afghanistan which have provided critical insights that have informed the development of the GEF project activities. In addition, multiple projects have focused on engaging rural communities in natural resource management, protected area management and environmental education. Some examples of these projects and the lessons learned are detailed below.

The FAO-led project **“Initiating participatory forestry in support of sustainable livelihoods in Afghanistan”** (IPF) implemented community forestry programmes in the provinces of Balkh, Baglan and Nangarhar¹. The primary mission of the IPF project was to improve the status of forest by demonstrating effective management mechanisms in a way that these resources could become a viable income source for the people. The project also intended to bring communities, government forestry departments and research institutions in a unique partnership to ensure sustainability of established participatory forestry practices. The project highlighted several challenges and benefits of CBNRM in rural Afghanistan, identified suitable participatory forest management methodologies for upscaling nationally, and provided FAO with additional experience in strategies for ensuring the success of community-based management approaches. The review of the IPF notes that the short implementation period of development projects is insufficient to evaluate and sustain the impacts of investments in sectors such as forestry. However, the project provided extensive training to national, provincial and district-level government representatives as well as to members of participating communities, which provides a baseline of technical capacity to continue the replication and upscaling of community-based forestry and NRM. The IPF also provided the seed funding to develop the initial PIF concept for this proposed GEF project, consequently the lessons learned and capacity built by the IPF project are directly relevant to the proposed GEF project. Therefore the proposed GEF project will rely strongly on the successful practices and approaches piloted by the IPF project and will aim to replicate and upscale the investments of the latter. Several recommendations that will be included in the design of the GEF Project include:

- Technical recommendations – Development and support of alternative livelihoods is critical to sustaining investments in forest protection and restoration to supplement the loss of household income. A successful approach applied by the IPF was promoting and providing training for women to establish nurseries for forestry and fruit trees. Promotion of agroforestry and prioritisation of commercially valuable plant species was also an effective means of supporting community livelihoods.
- Policy recommendations – The IPF review noted that sustainable development of natural resources was not prioritised in the context of the multiple pressing socio-economic needs in Afghanistan. Further support is required to ensure that existing policies for sustainable natural resource management are actively implemented and updated where necessary.
- Project management – The IPF applied different implementation modalities in the various pilot provinces owing to limited availability of field staff and supporting logistics. The operational and management costs of coordinating project activities in the pilot provinces is considerable and consequently it was recommended to identify cost-effective arrangements for management and implementation according to availability of local capacity.
- Inter-agency cooperation – The IPF noted the importance of including national and sub-national government staff in the design and implementation of the project to ensure sustained management

¹ FAO (2012). Project Findings and Recommendations. Initiating Participatory Forestry in Support to Sustainable Livelihoods in Afghanistan.

and oversight of the project's investments. The importance of coordination between ongoing initiatives was also emphasised.

The FAO-led **“Strengthened Approach for the Integration of Sustainable Environmental Management in Afghanistan”** (SAISEM) project was implemented jointly by FAO-UNDP-UNEP and had the primary aim of strengthening of the various natural resource management strategies of MAIL, NEPA and the MRRD. This initiative will support the proposed GEF project through the investments in capacity building and the institutional knowledge built within government technical staff. One of the key outputs of the SAISEM project was a summary overview of ‘Best Practices and Lessons Learned’ on CBNRM in Afghanistan. Several key lessons learned outlined by the SAISEM review are summarised below and are provided in more extensive detail in the review document¹.

- The active participation of communities in mapping the project area was an important tool for fostering ‘buy-in’ as well as for including traditional knowledge and practices in the project’s activities. Furthermore, the process of developing a visual planning tool supports the inclusion of all community members where limited literacy would be a barrier to inclusive planning.
- Government visibility at all stages of the project was an important determinant of community trust and acceptance of the project’s activities and the presence of government.
- A sense of security of tenure and self-determination should be fostered so that communities feel empowered to implement and invest in forest management. Simultaneously, communities who are granted stewardship rights must also provide government with assurance that the area in question will be used and managed with appropriate environment safeguards
- Participatory Rural Appraisal (PRA) approach is a useful tool for engaging communities in planning and implementing appropriate management practices.
- Information and knowledge on the original state of natural resources is scarce but is useful in establishing goals and indicators for management of a given area. Community elders are a valuable source of information.
- Traditional knowledge and practices are familiar and acceptable to participating communities, and these practices can be improved or developed further through application of contemporary science and emerging practices.
- A summary field manual on CBNRM for government officers is needed.

The USAID-funded project entitled **“Improving Livelihoods and Governance through Natural Resource Management”** (ILGNRM) was implemented by the Wildlife Conservation Society (WCS) in Bamyan and Badakhshan provinces. This project included a significant focus on promoting fuel-efficient cooking stoves (FECs) and provided important data and several key implementation lessons that have been included in the design of the proposed GEF project².

In terms of the approach to programme design, some lessons of the ILGNRM which are reflected in the proposed project design include: i) validate the preferred design of stove (SBES) in participation with end-user households; ii) pilot the preferred SBES prior to widespread distribution; iii) engage community associations to promote and sell SBES; and iv) subsidise SBES prices to drive adoption. In terms of technical aspects of the SBES design, the ILGNRM highlighted the potential design improvements that could be generated through feedback from users after an initial pilot phase. Furthermore, the ILGNRM highlighted the importance of promoting SBESs which are compatible with local cooking habits and other household energy needs e.g. systems which can be used to heat the home and boil water are preferable to systems which are intended only for cooking. Households which

¹ SAISEM (2011). Best Practices and Lessons Learned in Community-Based Natural Resource Management in Afghanistan. MDGF1713-E-11a-AFG: Strengthened Approach for the Integration of Sustainable Environmental Management in Afghanistan – A FAO-UNDP-UNEP Joint Programme

² USAID. 2013. Performance Evaluation: improving livelihoods and governance through natural resources management (ilgnrm) project, Afghanistan. Accessed on 31 October 2014. Available at: https://www.academia.edu/7808374/Performance_Evaluation_IMPROVING_LIVELIHOODS_AND_GOVERNANCE_THROUGH_NATURAL_RESOURCES_MANAGEMENT_ILGNRM_PROJECT_Afghanistan

benefited from FECs continued to use traditional *tandoors* and *bukharis* as needed for cooking and space heating in the winter months, to bake *naan* (flat bread) and/or when there are a large number of people to cook for. However, all users interviewed reported that they now use less fuel for cooking with the project stove, where most estimated at least 25% less fuel used.

Finally, the challenges experienced by this initiative underlined the need to understand and respond to the local social context as well as the technical requirements for SBES. For example, low numeracy and literacy among users challenged efforts to quantify household fuel use. Furthermore, monitoring and evaluation of SBES performance requires at least a year, considering that daily stove use is not homogenous and differs according to environmental, social and climatic differences.

- The USAID-funded **Afghan Clean Energy Project (ACEP)**¹ focused on developing capacity for off-grid and local electric power options with a particular emphasis on renewable energy. This project resulted in considerable technical and institutional capacity within energy ministries and also contributed to the establishment of the Kabul University Renewable Energy (KURE) Lab, thereby supporting a transfer of knowledge and institutional memory between initiatives². Several challenges highlighted by the ACEP project relate to the operational difficulties of implementation in Afghanistan's context, noting that logistic and security challenges undermine the effective implementation of project activities. Several key recommendations included: i) understand the needs of men and women in relation to their roles and promote technologies and services that satisfy these needs and are locally appropriate; ii) be aware that energy institutions tend to be male-dominated which results in issues identified and solutions offered having male bias; iii) engaging with women's associations is necessary to legitimise interventions which are likely to be implemented by women in practice.

The **Shelter** project³ undertook a study to assess the technical performance and suitability of a range of household heating and cooking systems used in Internally Displaced Persons (IDP) settlements. The study undertaken by this initiative is one of the more comprehensive assessments of styles and designs of biomass-based stoves in Afghanistan and generated basic data on cost, performance and fuel consumption of the various stoves employed by IDPs. The primary lesson reported by the Shelter project's report was that small, multi-purpose stoves tend to be better suited to use in Afghan IDP temporary settlements. In practical terms, it was noted that the preferred method for manufacturing stoves should consider whether or not to use an approach that requires welding, as this significantly increases production cost and makes repair costly and difficult for IDPs or communities without access to such tools. Locally procurable stoves tend to be made of very thin metal. This has the advantage that they are cheap and relatively easy to repair locally. As it is relatively expensive to braze or weld metal, and it is not possible to do so outside of the larger cities, locally fabricated stoves are generally made by hammering and crimping the metal whereas stoves that are built to a higher specification with thicker steel can only be made and repaired with welding/brazing equipment. Therefore, if the preferred approach is to catalyse small commercial enterprises related to the technology or stove type under demonstration, it is advisable to promote technologies that can be constructed and maintained locally.

The UNEP/Finland **Koh-e-Baba Partnership for Women and Natural Resources** was implemented with a local Afghan NGO, the Conservation Organisation for Afghanistan Mountain Areas (COAM).

¹ Cota, A. 2011. ACEP Winrock final report 2011. Accessed on: 31 October 2014. Available at: <http://www.usaid.gov/sites/default/files/documents/1871/Fact%20Sheet%20ACEP%20Afghan%20Clean%20Energy%20Project%20FINAL%20June%202011.pdf>

² Cota, A. 2011. ACEP Winrock final report 2011. Accessed on: 31 October 2014. Available at: <http://www.usaid.gov/sites/default/files/documents/1871/Fact%20Sheet%20ACEP%20Afghan%20Clean%20Energy%20Project%20FINAL%20June%202011.pdf>

³ Ashmore, J. 2002. Analysis of heating and cooking fuels and stoves in refugee, IDP and local settlements, Kabul, Herat, Afghanistan March 2002. Accessed on: 31 October 2014. Available at: http://www.shelterproject.org/downloads/peer1rep/stoves_06_02.pdf

The principle focus of this small project was on community-based natural resource management for communities situated in Bamyan Province around the proposed Koh-e-Baba national conservation area. The project has implemented a clean cookstove initiative, as well as developed improved briquettes for burning, two models of locally-appropriate improved cookstoves, and a solar water heater. The project has distributed over 230 household stoves, set aside community conservation areas to protect local shrubs, established community woodlots and trained local communities. The total cost for this project was under US\$ 50,000. The very high cost effectiveness of this programme can provide valuable lessons for other potential biomass energy projects.

APPENDIX 8: ANALYSIS OF LAND USE AND LAND USE CHANGE IN AFGHANISTAN AND PILOT DISTRICTS

8.1: Classification of land use and land use change in Afghanistan

Efforts to classify and estimate the spatial extent of Afghanistan's ecoregions and vegetation types have been challenged as a result of the absence of consistent monitoring during the prolonged periods of conflict and instability. At present, the most up-to-date classification of land cover is the 2010 Afghanistan Land Cover Database generated by FAO using 10m Color SPOT satellite image interpretation, and state-of-the-art FAO-developed tools and methodology¹. Currently a review of this data is being undertaken in comparison to the 1993 land cover database which will provide an updated assessment of the current spatial extent of vegetation cover as well as an indicative estimate of rates of change of vegetation over the period 1993-2010. The "enrichment" of the 2010 land cover database using air photos is anticipated to be finalised in March 2015. The finalised land cover database will provide the most accurate and comprehensive assessment of distribution and extent of vegetation in Afghanistan and will provide a basis for estimation of deforestation rates and land use change in the future. It should be noted that no field verification of the assumed land cover classes has been undertaken as a result of security considerations, and therefore there is a need for the assumptions of the land cover classification to be tested and revised based on groundtruthing in the future.

Several other assessments of Afghanistan's vegetation and ecoregions have been undertaken over the past decades, each of which use slightly different classification systems. One of the definitive guides is 'Flora and Vegetation of Afghanistan'², recently updated into a hardcopy field-guide entitled 'Field Guide Afghanistan: Flora and Vegetation'³. In addition to the former publication, the most frequently cited classifications of Afghanistan's vegetation are derived from the 1972 map 'Classification of the Potential Vegetation of Afghanistan Prior to Alteration by Human Activity'⁴. The former guide provides a vegetation map for the period *circa* 1963. Although it is acknowledged that the spatial extent of vegetation types indicated in the map is no longer valid as a result of widespread land use change, the map provides a guide for the ecological delineations of Afghanistan's vegetation types and the likely vegetation types that can be restored or reintroduced in areas which have been degraded or converted to other land uses. Subsequent assessments of vegetation extent and delineation of ecoregions have been based on the work of Breckle and Freitag in the abovementioned documents, such as the WWF's system of classification for delineation of ecoregions.

8.2 Current patterns of land use and land use change in Afghanistan

25 LCCS land cover classes were designated for Afghanistan's 2010 land cover map⁵, which were derived from the initial classifications used in the 1993 database. The land classes which contain woody biomass were:

- Irrigated Agricultural Land (AGI), comprising 4 separately mapped CCLS classes as follows:
- Irrigated agricultural areas with 2 crops/year, class (3A);
- Irrigated agricultural areas with 1 or 2 crops/year, class (3A1);
- Intermittently Irrigated Agricultural areas (every 2-3 years), class (3B) Active Karez Irrigated agricultural areas, class (3C).
- Rainfed Agricultural Land (AGR), consisting of rainfed cultivation in flat and sloping areas (respectively LCCS classes 4A and 4B);

¹ FAO's Land Cover Classification System, LCCS, Image segmentation (Definiens e-Cognition SW) and FAO Land Cover Mapping software (Terra Nova's GeoVis/MadCat software suite)

² Breckle, S-W. Flora and Vegetation of Afghanistan. http://www.ag-afghanistan.de/files/breckle_flora.pdf

³ Breckle, S-W., Rafiqpoor, M.D (2010). Field Guide Afghanistan: Flora and Vegetation

⁴ Freitag (1972). Classification of the Potential Vegetation of Afghanistan Prior to Alteration by Human Activity

⁵ FAO (2014). Afghanistan Land Cover Statistics Review In the Framework of FAO Project TCP/AFG/3501. Harmonization and Finalization of Land Cover Mapping and Approaches to Agricultural Monitoring

- Fruit Trees (AGT), LCCS class 2A;
- Vineyards (AGV), LCCS class 2B
- Tree-covered regions and shrub lands (NFS), consisting of:
- Needle-leaved Evergreen Forests (Dense and Open); Undifferentiated Tree-covered Regions and Shrublands (respectively LCCS classes 6A, 6B, 6B1 and 6C).
- Rangelands (NHS), LCCS class 7;

Other land use categories included in the classification were:

- Built-up Areas (URB), comprising urban and non-urban areas, LCCS classes 1A and 1B;
- Other Non-Agricultural Land Covers (BRS, BSD, WAT and SNW) consisting of:
- Barren Land (8A);
- Sand and Sand Dune covered areas (8B ,8C); and
- Water Bodies, Marshes, Rivers and River Beds (9A, 9B, 10A, 10B, 11, 12), and Permanent Snow (13).

The most important categories of vegetation for assessing the availability of woody biomass for the purpose of estimating availability of woody biomass for fuel use include:

Tree-covered regions and shrub lands (NFS), consisting of Needle-leaved Evergreen Forests (Dense and Open), Undifferentiated Tree-covered Regions and Shrublands (respectively LCCS classes 6A, 6B, 6B1 and 6C); and

Rangelands (NHS), LCCS class 7.

The reported figures in the 2010 Land Cover Database for the abovementioned LCCS categories are detailed in Table 17 below.

Table A8.1. Summarised changes in Afghanistan's woody vegetation, including forests, woodlands and rangelands, in the period 1993 – 2010¹

LCCS class	Sub-class	Land cover			
		1993 (ha)	2010 (ha)	% change	Total change (ha)
<i>Needle-leaved forest</i>	Total	95,231	59,382	-37.6	-35,849
	<i>Trees, dense</i>	83,119	2,375	-97.1	-80,744
	<i>Trees, open</i>	12,112	57,007	370.7	44,895
<i>Undifferentiated trees</i>	/	/	233,252	/	233,252
<i>Shrubland</i>	/	9,593	4,082	-57.5	-5,511
<i>Rangeland</i>		166,940	281,032	68.3	114,092

It should be noted that the precise composition and density of vegetation within these categories is highly variable according to altitude, aspect, topography and historical land use. As a result, it is likely that the species composition and vegetation density within these vegetation classes will be highly heterogeneous between sites. The analysis below is used to justify the assumptions of vegetation categories and estimated woody biomass found in the project's proposed implementation sites.

Summary of national land cover statistics indicates that the total national extent of natural needle-leaved evergreen forests in 2010 was ~983,038 ha, of which 79,614 ha was classified as 'closed needle-leaved trees' and a further 903,425 ha was classified as 'open needle-leaved trees'. Overall, the total spatial extent of needle-leaved evergreen forest was reduced by ~207,000 hectares or 17%. This equates to an annual deforestation rate of ~1.2% in evergreen forests. However, if the total spatial extent of all other woody vegetation categories are summed, it appears that the total area of wooded vegetation has increased rather than decreased since 1993. The revised land cover classification noted an increase in shrubland from 116,498 ha to 477,465 ha. Furthermore, the category of undifferentiated trees was not included in the 1993 classification. Therefore, without the benefit of further analysis, the

¹ FAO (2014). Afghanistan Land Cover Statistics Review In the Framework of FAO Project TCP/AFG/3501. Harmonization and Finalization of Land Cover Mapping and Approaches to Agricultural Monitoring

area of wooded forest cover could be interpreted to have increased overall in the period of 1993-2010, from 1,306,576 ha to 1,693,756 ha.

However, the statistical review of the respective land cover datasets notes that a decrease in forest coverage should be expected in consideration of the observed trends of illegal logging, agricultural expansion and excessive collection of woodfuel¹. Anecdotally, the observation and evidence of nationwide deforestation is widespread. Furthermore, the same statistical review notes that the discrepancies between total forest area can also be partially attributable to the differences in assumed land cover classes and the quality of satellite imagery adopted in the two respective databases. In particular, the major differences observed in the spatial extent of 'Closed Forests' and 'Open Forests' are suggested to be partly a function of the higher resolution of the SPOT imagery used for 2010 data, which allowed image analysts to differentiate between these two classes to a much higher level of accuracy. Consequently, although the comparisons between the 1993 and 2010 land cover databases indicate that forest coverage has decreased by ~17% ², equivalent to ~12,180 ha or ~1.2% per annum, it is probable that the actual rate of deforestation is considerably higher, considering the reported loss in historical extent of forest. For example, UNEP's 2003 report "Post-conflict environmental assessment" report³ notes that deforestation in the Eastern Region is particularly acute and estimates that ~50-80% of forests have disappeared in the period 1977 to 2002. Similarly, USAID estimates that pistachio woodlands have been exposed to considerable deforestation and degradation during the past 30 years, from 40 to 100 trees per hectare to the current estimate of 20 to 40 trees per hectare.

A significant weakness to the approach of estimating deforestation rate based on comparison of land use classes is that the method only allows consideration of spatial extent, and not density, of woody vegetation. Furthermore, in the absence of ground-truthed data it cannot be determined whether deforested areas are converted permanently into other vegetation categories (e.g. closed forest could be converted to open or undifferentiated trees, shrubs etc.) However, one explanation for the relatively low total rate of deforestation and the increase in certain woody vegetation classes, is that much of the biomass removal from Afghanistan's forests results in degradation rather than deforestation. Although it is acknowledged that certain forest areas may be subjected to 'frontier' deforestation and clear felling of lumber (e.g. those forests which are easily accessible or close to transport infrastructure), the removal of biomass through land uses such as grazing and firewood collection will result in thinning of vegetation and removal of woody biomass in small isolated fragments.

8.3 Current patterns of land use and land use change in pilot provinces – Nangerhar and Parwan

8.3.1 Categorisation of primary forest, woodland and scrub vegetation types in Parwan and Nangerhar

Nangerhar Province and Dara-e-Noor district

Nangerhar and the surrounding provinces in the Eastern Forest Complex (EFC) are primarily characterised by species such as *Quercus*, *Pinus*, *Juniper* and other evergreen forest tree species. These forest areas are interpreted to correspond to the LCCS class of 'Evergreen Closed' and 'Evergreen Open' forest. The vegetation type in this area closely corresponds to the WWF Ecoregion 'East Afghan Montane Conifer Forest'⁴. In the classification system used by Breckle, forest vegetation in this area includes the transition between the forest categories of 'Himalayan type Evergreen Forests in East Afghanistan' below 2,200m and 'Temperate Coniferous Forests of East Afghanistan'⁵. The

1 FAO (2014). Afghanistan Land Cover Statistics Review In the Framework of FAO Project TCP/AFG/3501. Harmonization and Finalization of Land Cover Mapping and Approaches to Agricultural Monitoring

2 FAO (2014). Afghanistan Land Cover Statistics Review In the Framework of FAO Project TCP/AFG/3501. Harmonization and Finalization of Land Cover Mapping and Approaches to Agricultural Monitoring

³ UNEP (2003). Post-conflict environmental assessment, United Nations Environment Programme, Afghanistan

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⁵ Breckle, S-W. Flora and Vegetation of Afghanistan. http://www.ag-afghanistan.de/files/breckle_flora.pdf

distribution of tree species within this ecoregion is primarily a function of altitude and corresponding rainfall and temperature. At altitudes of ~1,200m-2,100, vegetation is characterised by *Quercus baloot* as well as several other commercially valued tree species such as almond (*Amygdalus kuramica*) and pistachio *Pistacia khinjuk*. Reportedly, these forests have been severely overexploited for fodder, fruits and woodfuel and as a result the majority of the vegetation has been degraded or converted to other land uses. At an altitude of 2,100-2,500 m, forests are largely characterised by a transition between *Q. baloot* and dry coniferous species such as *Pinus gerardiana*. Deforestation or overgrazing of this vegetation results in a conversion to *Cotoneaster-Sophora-Rosa* scrubland. At higher altitudes of 2,500-3,100 m, species composition is characterised by a mix of temperate deciduous species and conifers, including *Picea smithiana*, *Pinus wallichiana*, *Quercus semecarpifolia*, and *Cedrus deodara*. This vegetation type is severely threatened by illegal logging, particularly for the highly valued *Cedrus* timber, and is converted to stable communities of *Artemisia* scrubland. Above 3,100 m, cedar forests gradually transition into junipers such as *Juniperus seravschanica*¹.

The vegetation that characterises the EFC, including Nangerhar as well as surrounding provinces, comprise a wide variety of commercially valuable and useful species that have the potential to generate multiple benefits for local communities. Commercially valuable products generated by these forests include woodfuel, timber, fruits and nuts, and fodder for livestock. As a result of the prolonged exploitation of these forests, the spatial extent and biomass density of these forests continues to decline while the productivity of existing forests continues to decrease as a result of degradation and overexploitation.

Parwan Province and Salang district

The Central Highlands region is largely characterised by rangelands and meadows in the lower-to-middle mountain sides and large rocky outcrops and snowcapped mountain peaks. The province of Parwan is not renowned as a heavily forested area. The wood-bearing rangeland vegetation types vary with environmental factors such as altitude and aspect. Furthermore the composition of species in highland rangelands also varies depending on the degree of accessibility to nearby communities, where the most accessible rangelands are exposed to a greater degree of degradation from livestock grazing and woodfuel collection.

However, although the province of Parwan is not dominated by woody vegetation, there are several districts within the province which still support fragmented areas of woodland, including pistachio khinjak and *Amygdalus* wild almond. In comparison, the forest types in Nangerhar are assumed to correspond to ‘Evergreen closed-open forests’. The other two important forest/woodland classes identified in the updated 2010 land cover database for Afghanistan are the categories of ‘closed-to-open undifferentiated trees’, and ‘shrubland/degenerated forest’ respectively. Nationally, the total area of these two respective classes was 233,252 ha and 477,465 ha, respectively. It was assumed that the latter two classes of vegetation were the dominant land cover classes of forest/woodland found in Parwan, such as those reported by interviewees during provincial consultation (Appendix 8). It was assumed, for the sake of establishment of default above-ground biomass estimates of forested areas in Parwan that the majority of wooded vegetation in Parwan was of the class of closed-to-open undifferentiated trees, also consistent with the small patches of wild almond (*Amygdalus*) observed during the PPG consultation visits to Salang district in Parwan.

During the PPG phase, provincial consultations confirmed the availability of remaining woodland areas in Salang district, both by observation and confirmed by interviews with community members. Respondents indicated that woodlands in the vicinity of their homesteads still included extensive areas of tree vegetation. It was noted that growth of shrubs and bushes had increased, which may indicate encroachment of bush into previously forested areas or may be the recovery of natural vegetation after a period of drought or damage caused during conflict periods.

8.3.2 Rates of deforestation and land use change in natural vegetation in Parwan and Nangerhar

¹

Comparison of land cover data between 1993 and 2010 provides some indication of the localised dynamics of land use change in Nangerhar and Parwan Provinces. As described in the previous section relating to national land cover data, comparisons between these data sets should be interpreted cautiously in consideration of the differences in image quality and method applied in the two studies. Further, it is emphasised that comparison of absolute forest cover between 1993 and 2010 will result in a significant underestimation of biomass removal, since this approach will only assess loss of forest cover and not forest density.

Nangerhar Province and Dara-e-Noor district

Overall the most prominent effects to be observed between 1993 and 2010 are: i) the reduced total forest area in Nangerhar by ~37%; and ii) the conversion of dense forest cover to open forest cover. These results are significant for assessing deforestation and forest degradation because they indicate woody biomass has been lost due to both the spatial reduction of forest area but also the degradation of forest area which has resulted in a loss of tree density.

Table A8.2. Land cover change in Nangerhar Province and Dara-e-Noor district 1993-2010.

		Land cover			
LCCS class	Sub-class	1993 (ha)	2010 (ha)	% change	Total change (ha)
<i>Needle-leaved forest</i>	Total	95,231	59,382	-37.6	-35,849
	<i>Trees, dense</i>	83,119	2,375	-97.1	-80,744
	<i>Trees, open</i>	12,112	57,007	370.7	44,895
<i>Undifferentiated trees</i>	/	/	233,252	/	233,252
<i>Shrubland</i>	/	9,593	4,082	-57.5	-5,511
<i>Rangeland</i>		166,940	281,032	68.3	114,092

It is likely that considerable spatial extent of forest remains in good or pristine condition, particularly in remote areas which cannot be accessed by road. However, the EFC has experienced considerable localised deforestation as a result of illegal logging and smuggling across the border into neighbouring Pakistan and has reportedly undergone considerable localised deforestation and widespread degradation. The availability of ground-truthed observations to assess the relative density and degree of degradation of these forests is severely limited, partly as a result of the remote and inaccessible nature of the forests as well as the widespread insecurity challenges that characterise the area. Therefore it is likely that the condition of remaining forest areas is likely to be highly variable, both between and within districts, and may exist as a mosaic of unaltered, recovering and degraded forests.

Consequently, for the sake of establishment of conservative default above-ground biomass estimates and rate of loss of biomass from woody vegetation, the ratio of closed to open needle-leaved forests was assumed to be ~14.2%:85.8% in Dara-e-Noor, based on the distribution of vegetation classes within Nangerhar province. The deforestation rate of 37.6% over 17 years is assumed to be linear, and is equivalent to a localised annual deforestation rate of 2.8%.

Parwan Province and Salang district

Table A8.3. Land cover change in Parwan Province and Salang district 1993-2010.

		Land cover			
LCCS class	Sub-class	1993 (ha)	2010 (ha)	% change	Total change (ha)
<i>Needle-leaved forest</i>	Total	605	76	-87.4	-529
	<i>Trees, dense</i>				
	<i>Trees, open</i>	605	76	-87.4	-529
<i>Undifferentiated trees</i>					
<i>Shrubland</i>			836		

<i>Rangeland</i>		662,365	408,741	-38.3	-253,624
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The land cover data indicates that the primary woody vegetation classes are rangeland, shrubland and open trees. Comparison of land cover data between the two timepoints indicates a significant reduction in the category of open trees, equivalent to a reduction in spatial area of ~87%. However, it should be noted that the total area of woodland suggested by these data are inconsistent with figures reported by MRRD, based on community estimates of forested area, which indicate an area of ~ 1,675 ha of forest and woodland in Parwan province¹. These figures highlight the difficulty in estimating land use and vegetation distribution in the absence of ground-truthed data, and furthermore indicate that analysis of satellite imagery may be too insensitive to detect small or fragmented areas of vegetation.

Consequently, for the sake of establishment of conservative default above-ground biomass estimates and rate of loss of biomass from woody vegetation, the assumed deforestation rate for Salang district is based on the rate of forest loss in the category of ‘open trees’ within Parwan province. The deforestation rate of 87.4% over 17 years is assumed to be linear, and is equivalent to a localised annual deforestation rate of 11.3%. This particularly high rate of deforestation may be attributed to the concentration of extractive pressures on a small area of forest relative to the size of the population in the project area.

8.3.3 Annual loss of woody biomass and emission of GHGs from land use change in natural vegetation in Parwan and Nangerhar

IPCC Good Practice Guidance² propose the default above-ground growing stock volume (AGV) and biomass (AGB) of Afghanistan’s forests as 22m³/ha and 27t/ha, respectively. However these estimates are assumed as an average of all forest types, ranging from closed evergreen forest to undifferentiated open woodland. Considering the ecological and climatic differences between provinces and the resultant differentiation in vegetation type, it is recommended to assume specific AGV and AGB for different vegetation types to establish accurate estimates of woody biomass on a sub-national level. In the absence of locally-verified and current information on the mean annual increment and density of woody biomass from Afghanistan’s forests, default estimates based on IPCC Good-Practice Guidelines (GPG) for LULUCF have been adopted.

Nangerhar Province and Dara-e-Noor district

Based on the IPCC GPGs, both classes of needle-leaved evergreen forests as well as differentiated closed-open trees in Nangerhar were assumed to correspond most closely to dry montane forests. Therefore, the aboveground woody biomass assumed for the closed forest category was ~50 tonnes/hectare, and a mean annual increment of 3 tonnes/hectare (assuming stand age of <20 years). These figures can be considered conservative, as the GPGs cite an aboveground biomass of <70 tonnes/hectare and 50 tonnes/hectare for *Quercus* and *Pinus* forest (both of which are major components of EFC forest).

Considering the strong indications that land use change manifests both as: i) absolute loss of spatial forest cover; as well as ii) loss of forest density as a result of conversion from closed to open forest; the preferred approach to estimating GHG emissions from land use change is to compare estimates of total standing biomass at the starting and final stages. Therefore, this approach to analysis requires the adoption of several assumptions. For the analysis of land use change and resultant GHG emissions in Nangerhar and Dara-e-Noor, the following assumptions were defined:

- Vegetation classified as ‘closed evergreen forest’ contains the most woody biomass and is favoured for harvesting of lumber, woodfuel and forest products;
- ‘Closed evergreen forest’ is converted to ‘open forest’, shrubland/degenerated forest, and rangeland.

¹ [www.mrrd-nabdp.org/attachments/article/249/Parwan Provincial Profile.pdf](http://www.mrrd-nabdp.org/attachments/article/249/Parwan%20Provincial%20Profile.pdf)

² IPCC Good Practice Guidelines for LULUCF. Chapter 3: LUCF Sector Good Practice Guidance, Appendix 3A.1 Biomass Default Tables for Section 3.2 Forest Land

- Considering that overall changes in rangeland area were relatively minor in Nangerhar, it is assumed that the major effect of deforestation and degradation in primary forests is conversion to 'open forests' and 'shrubland/degenerated forest'.
- In the absence of locally verifiable data, the difference in woody biomass between 'closed' and 'open' evergreen forest is based on FAO assessments of biomass density in Indian forests. Calculation of biomass densities for various forest types/strata for 1995 for canopy densities of >70%, 40-70% and 10-40% indicate that forest with canopy density of 40-70% and 10-40% show average growing stock as 74.1% and 28.2% respectively, of the growing stock with canopy density of more than 70%¹. Therefore, the aboveground woody biomass of 'open evergreen forest' was assumed to be equivalent to 28.2% of 'closed evergreen forest' i.e. 28.2% of 50 tonnes/ha = 14 tonnes/ha.
- The vegetation category of 'shrub/degraded forest' was assumed to equate most closely to the vegetation class 'Temperate shrubs' defined under the IPCC Global Carbon Biomass map². The figures used in the latter assessment are based on IPCC guidelines and are therefore consistent with the default assumptions adopted for other vegetation categories. This category of vegetation has a biomass carbon content of 7.4 tonnes/hectare which is equivalent to 14.8 tonnes of woody biomass/hectare. Assuming a root:shoot ratio of 0.47:0.53, the assumed aboveground woody biomass content in shrub/degenerated forest is 7.8 tonnes woody biomass/hectare.

Using these assumed default estimates of aboveground biomass and mean annual increment, the change in total woody biomass carbon in the major wooded vegetation categories between 1993 and 2010 in Nangerhar are summarised in Table A.8.4 below.

Table A8.4. Change in total woody biomass carbon between 1993 and 2010 in Nangerhar.

LCCS class	Aboveground woody biomass (tonnes/ha)	Biomass (tonnes)			
		1993	2010	Total change	Annual change
<i>Trees, dense</i>	50	4,155,950	118,732	-4,037,219	-237,483
<i>Trees, open</i>	14	169,568	798,092	628,524	36,972
<i>Shrubland</i>	7.8	74,825	31,837	-42,988	-2,529
<i>Total</i>		4,400,343	948,661	-3,451,682	-203,040

The above results indicate that the total removal of woody biomass vegetation in the period 1993 – 2010 resulted in the loss of ~3,4562 kilotonnes of wood, equivalent to 203 kilotonnes of woody biomass per annum. **In terms of equivalent GHG emissions, this trend in land use in Nangerhar caused emissions of ~373,000 tonnes CO₂equivalent per annum³.**

Parwan Province and Salang district

Based on the observations of the PPG team and the existing information on vegetation types and ecoregions in Afghanistan, the main classes of woody vegetation which are relevant for estimating GHG emissions resulting from land use change are 'open forests', 'shrubland/degenerated forest' and 'rangeland', all of which are sources of woody biomass fuel in the project area.

Considering the strong indications that land use change manifests both as: i) absolute loss of spatial forest cover; as well as ii) loss of forest density as a result of conversion from closed to open forest;

¹ FAO (2003). Tropical deforestation and forest degradation: a case study from India. Joshi, M.J., Singh, P.P., XII World Forestry Congress. <http://www.fao.org/docrep/ARTICLE/WFC/XII/0250-A1.HTM>
² Ruesch, Aaron, and Holly K. Gibbs. 2008. New IPCC Tier-1 Global Biomass Carbon Map For the Year 2000. Available online from the Carbon Dioxide Information Analysis Center [<http://cdiac.ornl.gov/>], Oak Ridge National Laboratory, Oak Ridge, Tennessee

³ Assuming biomass carbon content of ~50% and total conversion to CO₂ as opposed to other GHGs.

the preferred approach to estimating GHG emissions from land use change is to compare estimates of total standing biomass at the starting and final stages. Therefore, this approach to analysis requires the adoption of several assumptions. For the analysis of land use change and resultant GHG emissions in Parwan province and Salang district, the following assumptions were defined:

- It is assumed that the major effect of deforestation and degradation is conversion from open woodland to shrubland/degenerated forest and rangeland.
- In the absence of locally verifiable data, the assumed woody biomass content of 'open' evergreen forest is based on the same assumptions for Dara-e-Noor (above). Therefore, the aboveground woody biomass of 'open evergreen forest' was assumed to be equivalent to ~14 tonnes/ha.
- The vegetation category of 'shrub/degraded forest' was assumed to equate most closely to the vegetation class 'Temperate shrubs' defined under the IPCC Global Carbon Biomass map¹. The figures used in the latter assessment are based on IPCC guidelines and are therefore consistent with the default assumptions adopted for other vegetation categories. This category of vegetation has a biomass carbon content of 7.4 tonnes/hectare which is equivalent to 14.8 tonnes of woody biomass/hectare. Assuming a root:shoot ratio of 0.47:0.53, the assumed aboveground woody biomass content in shrub/degenerated forest is 7.8 tonnes woody biomass/hectare.
- The aboveground woody biomass in rangeland areas was assumed to equate most closely to the vegetation of 'grasslands: temperate continental, temperate mountain systems cited in the IPCC Global Carbon Biomass map². Therefore this category of vegetation has an assumed aboveground carbon mass of 2.25 tonnes/hectare and aboveground woody biomass of 4.5 tonnes/hectare.

Using these assumed default estimates of aboveground biomass and mean annual increment, the change in total woody biomass carbon in the major wooded vegetation categories between 1993 and 2010 in Parwan are summarised in Table A8.5 below.

Table A8.5. Change in total woody biomass carbon between 1993 and 2010 in Parwan

LCCS class	Aboveground woody biomass (tonnes/ha)	Biomass (tonnes)			
		1993	2010	Total change	Annual change
<i>Trees, open</i>	14	8,470	1,066	-7,404	-436
<i>Shrubland</i>	7.8	0	6,520	6,520	384
<i>Rangeland</i>	4.5	2,980,643	1,839,335	-1,141,307	-67,136
<i>Total</i>		2,989,113	1,846,922	-1,142,191	-67,188

The above results indicate that the total removal of woody biomass vegetation in the period 1993 – 2010 resulted in the loss of ~1,142 kilotonnes of wood, equivalent to 67 kilotonnes of woody biomass per annum. **In terms of equivalent GHG emissions, this trend in land use in Parwan caused emission of ~123,000 tonnes CO₂equivalent per annum³.**

1Ruesch, Aaron, and Holly K. Gibbs. 2008. New IPCC Tier-1 Global Biomass Carbon Map For the Year 2000. Available online from the Carbon Dioxide Information Analysis Center [<http://cdiac.ornl.gov/>], Oak Ridge National Laboratory, Oak Ridge, Tennessee

2Ruesch, Aaron, and Holly K. Gibbs. 2008. New IPCC Tier-1 Global Biomass Carbon Map For the Year 2000. Available online from the Carbon Dioxide Information Analysis Center [<http://cdiac.ornl.gov/>], Oak Ridge National Laboratory, Oak Ridge, Tennessee

³ Assuming biomass carbon content of ~50% and total conversion to CO₂ as opposed to other GHGs.

APPENDIX 9: HOUSEHOLD PROFILE AND BIOMASS FUEL USE IN PILOT DISTRICTS

9.1.1 Identification of pilot project sites

Elaboration of PIF-proposed site choices

During the PPG phase, consultations with national stakeholders included a large emphasis on the appropriate approach to selecting sites for field activities. The PIF concept proposed implementation in three pilot areas which represented unique ecosystems, namely the Pistachio Belt in Herat/Baghdis Provinces, the Eastern Forest Complex (potentially including Nangerhar, Loghar, Kunar, Nuristan Provinces), and a third site in the Central Highlands. However, in consideration of the large logistic and financial implications of field-based activities, it was recommended by multiple stakeholders to reduce the scope of the field activities to two pilot provinces. Further, a consistent theme in stakeholder consultations and literature is the need to focus on sites which have a track record of relative stability and security, community participation in governance, and with adequate infrastructure and accessibility.

During the PPG Inception Workshop, a participatory exercise was undertaken with participants to develop a set of site selection criteria and potential suggestions for implementation sites. It was proposed that the Pistachio Belt sites be discarded in consideration of the great distance from Kabul and also with the knowledge that upcoming LDCF investments would focus on this project area. It was proposed that the Central Highlands be included within the project's activities for the reason that rangelands and open woodlands are also important sources of household fuel and other valuable products, and that natural resource management should include ecosystems other than forest.

Identification of pilot provinces

The inclusion of one of the Eastern Forest Complex provinces was broadly supported by workshop attendees in consideration of the valuable forest resources in the area, however, it was noted that the interior of the EFC is insecure and difficult to access. Of the several provinces in consideration, the province of Nangerhar was strongly supported by participants for the reasons that the provincial capital of Jalalabad is well-represented by government and international agencies (including FAO), is serviced by adequate transport infrastructure, and is relatively secure in certain districts. Government officials in the province have accumulated some experience and capacity as a result of previous initiatives related to forest management and natural resources, such as the FAO project on Participatory Forest Management. Furthermore, it was noted that MRRD had previously implemented several community-based biogas digester projects, however the outcomes of these projects were unclear and there was a need to follow on from these previous initiatives. The NGO MADERA has previously undertaken community-based projects in this province and is an NSP facilitating partner, and would therefore be well-placed to guide the implementation.

The province of Parwan was proposed as a suitable representative of the Central Highlands Region. The province of Bamiyan was considered as a highly suitable province for implementation but it was also noted that this province had benefited considerably from government and foreign investments and there was a need to provide further benefits to surrounding provinces such as Parwan. The latter provinces was noted as a particularly cold area which had considerable needs for household energy. The majority of the province's hillsides are characterised by rocky outcrops and steep hillsides of low-growing rangeland vegetation, which is one of the primary sources of freely available household fuel in the rural interior. As a result of the widespread degradation of rangelands and meadows caused by household woodfuel collection, the province of Parwan was further supported by workshop participants in consideration of the need to promote NRM principles in rangeland ecosystems, not only those which are heavily forested. However, although Parwan is largely unforested, it was noted that several hillsides still contain sparse remnants of woodland (including wild almond, pistachio, mulberry) which could potentially be included within management plans. The provincial representation of MRRD and DAIL affirmed support for the project's activities and indicated that the existing technical capacity within provincial staff would support project implementation.

Identification of pilot districts

Following the adoption of the proposed pilot provinces, the PPG team undertook field missions to the provincial capitals in order to consult and introduce the project to representatives of government and communities. One of the primary objectives of the provincial consultations was to identify suitable districts within each province, based on the input of provincial representatives of MAIL, MRRD and NEPA.

In the province of Nangerhar, the district of Dara-e-Noor was proposed by the Provincial director of MAIL. Dara-e-Noor, Sorkhrod, Behsood and Khewa Districts were named as potential safe district to work in. However, Dara-e-Noor was emphasized as the most suitable due to security. In the province of Parwan, the district of Salang was proposed by the Provincial director of MAIL. Salang, Shinwari and Ghorband were considered as potential districts for field activities. However Ghorband was discouraged on the basis of security concerns. Salang district was proposed as a safe district for project activities which is accessible and which has pressing socio-economic needs. The proposed districts were affirmed by representatives of NEPA and MRRD as aligned with site selection criteria. The district governor of Salang was consulted and the support for the project's objectives was affirmed. The provincial representatives of MRRD and MAIL affirmed support for the proposed activities and indicated that well-capacitated staff were available within provincial offices to support project implementation.

Thereafter, the PPG team was introduced via MAIL and district officials to representatives of three CDCs in each proposed pilot district. From Dara-e-Noor district in Nangerhar, representatives of three villages in the vicinity of Shukyali were interviewed. From Salang district in Parwan, representatives of the villages of Honamak, Aghel Khan and Nawaj were interviewed. These interviews were used to inform the provincial and district profiles presented below.

9.1.2 Demographic background and population of pilot province and districts

Provinces: Nangerhar

Nangerhar province comprises 22 districts ranging from agricultural floodplains at ~800masl to forested mountain peaks at over 3,000masl. Consequently the province is quite variable in terms of economic activities, environment and accessibility. The province has a total population of ~1,450,000, many of whom are employed or trade in the provincial capital of Jalalabad, however the majority of the province are primarily farmers, livestock herders and other natural-resource based lifestyles. The province has seen strong involvement of MRRD in engaging communities in governance and development. A total of 247 NABDP projects had been implemented by 2012, and a total of 605 CDCs were established¹. Currently, this achievement has been furthered and there are 1835 CDCs and 21 DDAs.

Provinces: Parwan

Parwan province is a high altitude province which is bounded by high and inaccessible mountain peaks in the north and west. The area comprises 10 districts with a total population of ~650,000. The primary livelihoods are agriculture, livestock husbandry, trades&services, and labour. Currently a total of 831 CDCs and 10 DDAs have been established in the province².

Districts: Dara-e-Noor

Dara-e-Noor is a mountainous district in Nangarhar Province, located 40 km from Jalalabad. The district has an area of 336 km² and comprises 75 villages, which have a combined population of ~115,000 people. Of these 75 villages, 52 have been included in the NSP. Within Dara-e-Noor, at least 36 CDCs have been established. The majority of households derive their income from agriculture and livestock. Approximately 10% of men and 1% of women in the district are literate, and ~10% of households have access to electricity.

¹ [www.mrrd-nabdp.org/attachments/article/244/Nangarhar Provincial Profile.pdf](http://www.mrrd-nabdp.org/attachments/article/244/Nangarhar%20Provincial%20Profile.pdf)

² [www.mrrd-nabdp.org/attachments/article/249/Parwan Provincial Profile.pdf](http://www.mrrd-nabdp.org/attachments/article/249/Parwan%20Provincial%20Profile.pdf)

Districts: Salang

Salang is a mountainous district in Parwan Province, with an area of 408 km². The district comprises ~45,000 people in 105 villages with at least 44 CDCs established. The majority of households derive their income from agriculture and livestock. Approximately 30% of men and 10% of women in the district are literate. As of 2010, virtually no households had access to electricity and are heavily reliant on LPG, paraffin, woodfuels (including charcoal) and animal dung to meet domestic energy needs for cooking, heating and light.

9.1.3 Community engagement in governance and natural resource management

Dara-e-Noor

In March 2012, Dara-e-Noor district formed a male District Development Assembly (DDA) – with Women’s Advisory Committee (WAC) – for the second time. The DDA and WAC represent 10 groups/clusters of Community Development Councils (CDCs). The male DDA and WAC enhances cooperation between the communities and Government as well as ensuring community participation in district development planning and management processes. The DDA and women’s advisory committee identified retaining walls to protect communities and infrastructure from floods and landslides as a prioritised project idea¹. The group also specified five locations for these interventions, which could potentially also be addressed with complementary interventions in vulnerable watershed areas (e.g. improved grazing management, *qorog* exclosures, and revegetation). In addition, a major strategy identified under the second objective of the District Development Plan is ensuring access to reliable and affordable energy. The proposed GEF project is aligned with both community-identified priorities by: i) building capacity for CBNRM, which is complementary to approaches to reducing vulnerability through ecosystem restoration; and ii) promoting renewable alternatives to traditional biomass energy use.

Of importance to the implementation of NRM plans through Forest Management Committees, within Dara-e-Noor several FMCs have been established. In total, five FMCs have been established, in total representing an area of ~12,000 hectares and ~35,150 people. The primary forest types in the concerned areas include oak, olive, pine, walnut and various shrub/bush species. The details of these FMCs are presented in the table below².

Table A9.1. Details of Dara-e-Noor FMCs.

Village	Head of FMC	No. of Committee Members	Head of FMC Tel. No.	Population within FMC	Forest Area (Ha)
Shokyali	Sayed Koly Shah	11	93776774729	4,500	2,000
Shameel	Abdul Malik	11	93774966942	6,000	3,000
Vygal	Hakeem Jan	11	93799385867	13,650	3,000
Stan	Haji Mohammad Alam	11	93771317114	5,000	2,000
Majgandol	Abdul Qodos	11	93773369505	6,000	2,000

Salang

In October 2010, Salang district formed a male DDA and WAC for the second time. The DDA and WAC represent 10 groups/clusters of CDCs. The male DDA and WAC enhances cooperation between the communities and Government as well as ensuring community participation in district development planning and management processes. The DDA and women’s advisory committee identified retaining walls to protect communities and infrastructure from floods and landslides as a prioritised project

¹ Dara-e-Noor District Prioritised project idea. Available at: <http://www.mrrd-nabdp.org/attachments/article/399/Dara-e-Noor%20Prioritized%20Project%20Ideas.pdf>. Accessed on 1 December 2014.

² Islamic Republic of Afghanistan, Nengarhar Province, Department of Agriculture, Irrigation and Livestock, General Office of Natural Resources, List of Dara-e-Noor District FMCs

idea¹. The group also specified four locations for these interventions. In addition, a major strategy identified under the third objective of the District Development Plan is ensuring access to reliable and affordable energy. The proposed project is aligned with both community-identified priorities through: i) CBNRM and EbA; and ii) promoting FECS and biogas use.

With respect to the establishment of FMCs in Salang, at present only one known FMC has been established. The Committee includes 11 members as representatives of the village of Nawaj, cumulatively representing ~450 households. At present, the status of finalised forest management plans is unknown, nor is it known whether any existing plan is actively being implemented. The primary vegetation types and valuable species included in the Salang area include woodland of wild mountain almost, oak, pistachio *khinjak* and mulberry. In addition, the district has large areas of rangeland which are characterized by various shrub and bush species which are important sources of woodfuel as well as fodder for livestock.

9.1.4 Factors to support project implementation

Dara-e-Noor, Nangerhar

Security and stability:

- The district was proposed and affirmed by provincial representatives of government stakeholders. Furthermore the project area is close to Jalalabad which provides useful supporting infrastructure and representation of stakeholder agencies.
- Implementing partners and aligned initiatives, including FAO, MADERA, and UNEP, have previous experience working in the province and have a well-established presence in working with communities.

Suitability of proposed interventions:

- Households in the district are heavily reliant on natural resources, including forest products.
- Previous initiatives have established FMCs, however there is a need to capacitate these committees and assist them to design and implement NRM plans.
- Provincial representatives of stakeholder agencies have affirmed the feasibility and relevance of project's activities.
- The area includes considerable areas of agriculture and nursery growers who can provide supporting services (see List of Nursery growers in Appendix 13 below).

Relevance to communities:

- All interviewees noted the cost of accessing adequate woodfuel. Interviewees were not familiar with alternative or improved methods of using biomass energy but would be willing to trial new approaches.

Salang, Parwan

Security and stability:

- The district was proposed and affirmed by provincial representatives of government stakeholders. Furthermore the district governor affirmed his support for the project's objectives and indicated that security challenges and accessibility to communities would not hinder project activities.

Suitability of proposed interventions:

- Households in the district and province have large energy needs, particularly in consideration of the prolonged and severe winter. Furthermore, the area has considerably less woody biomass density than forested provinces such as Nangerhar and in consequence the demand for woodfuel is contributing to degradation of fragile rangeland areas.

¹ Salang District Prioritised project idea. Available at: <http://www.mrrd-nabdp.org/attachments/article/402/Salang%20Prioritized%20Projects%20Ideas.pdf>. Accessed on 1 December 2014.

- Provincial representation of MRRD has affirmed support for the promotion of biogas as a pilot technology. Furthermore, the agency BORDA has indicated an interest in trialling new approaches to biogas in the cold climate of areas such as Parwan.
- Communities in the area are familiar with activities complementary to NRM, such as use of *Qorog* exclosures, establishment of woodlots and grazing management. Consequently the concepts of the project's activities will be familiar. Furthermore, the staff within DRRD and DAIL include some experienced and well-capacitated technical officers.
- The village of Nawaj has created a Forest Management Committee (FMC), however there is a need to replicate and upscale the promotion of NRM through these committees at a district scale.
- The area includes considerable areas of agriculture and nursery growers who can provide supporting services (see List of Nursery growers in Appendix 13).

Relevance to communities:

- All interviewees noted the cost of accessing adequate woodfuel. Interviewees were not familiar with alternative or improved methods of using biomass energy but would be willing to trial new approaches.

9.2.1 Results of household surveys

Dara-e-Noor

The PPG team interviewed representatives of three villages in the vicinity of Shukyali. The social setting of these communities is that multiple family members and their extended families will live close together, therefore there are some difficulties in distinguishing between ‘family size’ and ‘household size’. In the village of Shukyali, for example, one of the respondents came from a household of 21 people, representing six brothers and their families. The family collectively farms an area of 6 *jeribs* or 1.2 hectare. The households in this area farm crops such as wheat, corn, fruits and vegetables using both rainfed and irrigated methods. Most households also keep several varieties of livestock. In the case of Shukyali, the household interviewed kept 3 cows, 4 goats, 4 sheep and 40 chickens, which is somewhat more than the average household.

The nearby mountainsides and forests were identified as the most important source of pasture for grazing livestock. These areas are used communally for grazing and shared between neighbouring households. It was noted that remaining forests were reduced in size, however the area had an increased growth of bush and shrub vegetation. Woodfuel is collected from nearby forests, trees and crop residue available on the farm, and purchased from a nearby wood market. Woodfuel is used for household cooking, heating, lighting and warming of water. The primary fuel is firewood and brush, supplemented with LPG and cow dung.

Salang

The PPG team interviewed representatives of three villages in the vicinity of Aghel Khan, Honamak and Nawaj. The average household size is ~7 people. Much of the agriculture in the area is for subsistence rather than commercial production, where households will manage a small area of ~2 *jeribs* (~0.2ha). Many families also supplement income by harvesting goods such as walnut, mulberry and almonds. Most households also keep livestock, most commonly goats and cows. In the case of Aghel Khan, the household interviewed kept 1 cows and 4 goats. Cows were previously more common for household production but increasingly goats are favoured, potentially as a result of the reduced availability of fodder for cattle.

The nearby mountainsides and forests were identified as the most important source of pasture for grazing livestock. These areas are used communally for grazing and shared between neighbouring households. Although the district of Salang overall is not known as a forested district, respondents indicated that woodlands in the vicinity of their homesteads still included extensive areas of tree vegetation. It was noted that growth of shrubs and bushes had increased, which may indicate encroachment of bush into previously forested areas or may be the recovery of natural vegetation after a period of drought or damage caused during conflict periods.

The primary sources of fuel are firewood purchased from nearby markets, brushwood which can be collected or purchased, small amounts of charcoal for the *sandali* stove, and cow dung. In addition, household energy needs are supplemented with LPG.

9.3 Biomass fuel consumption in pilot areas per capita, per household, per district, per FMC

Interviews from the villages in Dara-e-Noor and Salang included detailed questions on the sources, costs, amounts used and applications of biomass fuels. Respondents provided their answers based on the most familiar unit of measurement, which may have included reporting directly in estimated kilograms, or alternatively in terms of cost per bag/bundle. Therefore the results of these surveys should be considered indicative estimates, particularly in consideration of the complex fuel mixes in question (including up to 6 sources of fuels for multiple applications). Furthermore, respondents were unable to provide considerable detail on the different energy requirements between summer and winter. Therefore, it is conservatively assumed that summer consumption of biomass fuel is equivalent to ~half the rate of consumption in winter, on the basis that household heating is the most significant driver of household energy use.

9.3.1 Household fuel consumption

Dara-e-Noor

In Dara-e-Noor, the primary household fuels are firewood, cow dung and LPG. These fuels are used for cooking, household heating, lighting, and heating of water. The most common methods of cooking are use of *tandoor* stoves and open fires. The most common methods of heating are the *bukhari* heater. Respondents included collected and purchased firewood in the estimates of household wood consumption. There are no local restrictions on the collection of wood by households and therefore the number of people in the household is the primary determinant of how much is collected. Cow dung is not purchased but only collected from kept animals. The price and daily consumption of these fuels in winter is detailed below.

Table A9.2. Household fuel consumption in Dara-e-Noor.

Fuel type	Unit cost	Daily use (kg)
Firewood	8 Afs/kg = ~(USD 0.14)	14
Cow dung	free	3.5
LPG	50 Afs/kg (~USD 1)	0.07

Salang

In Salang, the primary household fuels are firewood, cow dung, charcoal, crop residues, and LPG. Firewood includes purchased firewood, collected woody brush and grass, and crop residues. The most common method of heating is the use of *sandali* system, while the most common methods of cooking are the use of *tandoor* and open fires. It was noted that some wealthier households used the *bukhari* heater method but this represented less than 20% of households.

Table A9.3. Household fuel consumption in Salang.

Fuel type	Unit cost	Daily consumption (kg)
Firewood	15 Afs/kg (USD 0.26)	14
Cow dung	Freely collected	7
Wood (bushes and brush)	8 Afs/kg (USD 0.14)	3.5
Charcoal	25 Afs/kg (USD 0.43)	2
LPG	unknown	unknown

9.3.2 Emissions from biomass fuel use

To estimate the emissions of GHGs from household fuel consumption, several assumptions have been applied to account for the limited availability of data and to support a conservative estimation of household fuel use. The main assumptions are as follows:

- Household consumption of firewood is decreased by 50% during the summer months in consideration of the significant influence of winter temperatures on household fuel consumption. It was assumed that consumption of other fuels remains consistent between seasons, considering that household cooking requirements are unlikely to change seasonally and that brush and manure are used largely as ‘kindling’ to initiate fires fuelled by larger firewood pieces.

- Winter is assumed to persist for 5 months in Nangerhar and 6 months in Parwan.
- Average household sizes have been derived from the best available district-level census data, therefore figures will reflect the district average rather than the definite number of people per household in villages surveyed.
- Woodfuel is assumed to be ~50% carbon by mass which is converted to CO₂ upon combustion. Although it is acknowledged that other significant GHGs may be emitted upon combustion (including CH₄ and CO) there is an absence of reliable data to estimate these gases. Considering that CO₂ has the lowest climate-forcing potential of these gases, it is considered conservative to assume all carbon is converted to CO₂.
- It is assumed that charcoal is produced from wood at a conversion efficiency of ~20%. In the absence of locally verified data on charcoal kiln efficiency, this figure is considered conservative in comparison to the IPCC default assumption of 15%.
- With reference to assumption v) above, GHG estimates derived from charcoal consumption have been converted to wood equivalents (assuming wood:charcoal conversion efficiency of 20%).
- Number of people per household was based on figures received from MRRD. The data received from MRRD included details on the demographics of CDCs established in pilot provinces and districts. Within Dara-e-Nur, the CDCs established collectively represent a reported 88,743 people within 13,713 households. Consequently household size is estimated as 6.47 people/household. Within Salang, the CDCs established collectively represent a reported 33,975 people within 5,710 households. Therefore household size is estimated as 5.95 people/household.

The estimated GHG emissions per household and per capita are detailed below.

Dara-e-Noor, Nangerhar province

Table A9.4. Estimated GHG emissions per household and per capita in Dara-e-Noor, Nangerhar province.

Fuel type	Household fuel consumption rates	Unit	Annual household consumption (kg/year)
Dung	Winter consumption (kg/day)	3.5	1,277.5
	Winter duration (days)	152.1	
	Summer consumption (kg/day)	3.5	
	Summer duration (days)	212.9	
Firewood	Winter consumption (kg/day)	14.0	3,619.6
	Winter duration (days)	152.1	
	Summer consumption (kg/day)	7.0	
	Summer duration (days)	212.9	

By the estimates above, a household consumes over 1 tonne of cow dung and over 3.5 tonnes of firewood in a year. By applying the assumptions detailed previously, estimates of GHG emissions attributable to household consumption of biomass fuels can be derived.

Table A9.5. Estimated GHG emissions attributable to household consumption of biomass fuels in Dara-e-Noor, Nangerhar province.

Household fuel consumption rates	Annual household consumption (kg/year)	Annual per capita consumption kg/person/year	Annual household CO ₂ emission (kg/year)	Annual per capita CO ₂ emission (kg/person/year)
Dung	1,277.5	197.4	2,344.2	362.3
Firewood	3,619.6	559.4	6,641.9	1026.6
Total			8,986.1	1,388.9

The average per capita consumption of biomass fuel in Dara-e-Noor equates to an estimated ~1.4 tonnes CO₂equivalent per annum.

Salang, Parwan province

Table A9.6. Estimated GHG emissions per household and per capita Salang, Parwan province.

Household fuel consumption rates		Unit	Annual household consumption (kg/year)
Dung	Winter consumption (kg/day)	3,5	1277,5
	Winter duration (days)	152,1	
	Summer consumption (kg/day)	3,5	
	Summer duration (days)	212,9	
Firewood	Winter consumption (kg/day)	14,0	3619,6
	Winter duration (days)	152,1	
	Summer consumption (kg/day)	7,0	
	Summer duration (days)	212,9	
Brush	Winter consumption (kg/day)	3,5	1277,5
	Winter duration (days)	152,1	
	Summer consumption (kg/day)	3,5	
	Summer duration (days)	212,9	
Charcoal	Winter consumption (kg/day)	2,0	2433,3
	Winter duration (days)	152,1	
	Summer consumption (kg/day)	2,0	
	Summer duration (days)	212,9	

Table A9.7. Estimated GHG emissions attributable to household consumption of biomass fuels in Salang, Parwan province.

Household fuel consumption rates	Annual household consumption (kg/year)	Annual per capita consumption kg/person/year	Annual household CO ₂ emission (kg/year)	Annual per capita CO ₂ emission (kg/person/year)
Dung	1,277.5	214.7	2,344.2	394.0
Firewood	3,619.6	452.4	6,641.9	830.2
Brush	1,277.5	214.7	2,344.2	394.0
Charcoal	2,433.3	304.2	4,465.2	558.1
Total			15,795.5	2,176.4

The average per capita consumption of biomass fuel in Salang equates to an estimated ~2.2 tonnes CO₂equivalent per annum.

9.4. Appendix Nengarhar Mission Report

Date: Oct 28-30, 2014

PPG Team Members:

- Hamidullah Akbary – FAO/AF/GEF – National Forestry Expert
- Ahmad Murtaza Ershad – FAO/AF/GEF – National Institutional & Policy Expert

Mission Objectives:

- ☐ Introduce project to provincial MAIL, NEPA, MRRD, Mew, ME provincial directors
- ☐ Identify and coordination with NEPA, MAIL and other stakeholders during the project site selection
- ☐ Strengthen coordination between PMU and Provincial authorities for future cooperation on project execution.
- ☐ Facilitating establishment of Provincial Coordination Team (PCT) after acquiring political support of Governor.
- ☐ Gathering information on site security for project execution areas
- ☐ Identifying which agencies e.g. CDC, Shura, NGO (national/international) are currently present in Nengarhar province
- ☐ Consider if these agencies have capacity to support project implementation e.g. with information, coordination, or direct roles in project implementation
- ☐ Discuss appropriate approaches to CBNRM – consider how to build community resilience, develop capacity and support livelihoods in Nengarhar Discuss appropriate approaches to efficient biomass technologies.
- ☐ Conduct meetings with local and international NGOs to coordinate for future collaboration, and to gather information that will support project
- ☐ Identify available CDCs /FMCs
- ☐ Best-practices, lessons learned, data and information from previous
- ☐ Conduct meeting with CDCs to collect information that will guide the implementation of the project.
- Information needs particularly related to forestry and natural resource use, and use of biomass and other fuels for domestic energy

Tuesday, October 29, 2014

- FAO Office – JALALABAD

Meeting with: Dr. Mustafa Zafar – Director

Meeting Minutes:

- Current projects include diary, irrigation and pest management.
- Recommendations
 - Trees need to be planted and a sustainable irrigation plan need to be developed otherwise projects fails as is the case in a lot of Nengarhar projects.
 - Biogas projects can be sustainable if two points are considered:
 - Spent from digesters should be transported by metal containers that prevent from spilling. Thus, there should be a good plan for transportation of spent.
 - Mixing handles should be changed to automatic from the current manual ones. Electricity from solar PV could be couples with these digesters.
- Solar PV is very common for lighting.
- NEPA – Nengarhar Office
- *Meeting with:* Fazel Rabi Hameem – Director
- Tel: +93 700 766 99 22 84
- Hameemfr11@hotmail.com
- *Meeting Minutes:*

- Project was introduced by Mr. Akbari and Murtaza.
- NEPA showed willingness for future cooperation.
- MAIL – Nengarhar Office
- *Meeting with:* Hamidullah – Director
- *Meeting Minutes:*
- Project was introduced by Mr. Akbari and Murtaza.
- MAIL showed willingness for future cooperation.
- Dara e Noor, Sorkhrod, Behsood and Khewa Districts were named as potential safe district to work in. However, Dara e Noor was emphasized as the most suitable due to security.
- Two of MAIL staffs were appointed as focal points by the director for future cooperation. They are Mr. Babury who is responsible for artificial forests projects and Mr. Bashary who is the head of planning unit at MAIL Nengarhar.

Wednesday, October 29, 2014

- MRRD – Nengarhar Office
- *Meeting with:* Eng. Hakim Omarkhil - Director
- +93 700 60 16 17
- *Meeting Minutes:*
- Project was introduced by Mr. Akbari and Murtaza.
- MRRD showed willingness for future cooperation.
- Director's comments and recommendations:
 - Energy project has to include a detailed plan.
 - Sites need to be surveyed first and community's inputs should be included in the design phase of the project.
 - Community projects are better than individual stand-alone projects (e.g community biogas projects)
 - People need to contribute financially to the projects for them to be sustainable
 - Experts are expected to go the project site to make professional judgments regarding the quality of the projects. A lot of the projects fail because engineers are not present at the site maybe due to security
- No NGO is active in the field of biogas in Nengarhar. All of the biogas projects are installed by the community with the technical help of MRRD engineers.
- There are 1835 CDCs a (Community Development Councils) and 21 DDAs (District Development Assembly) in Nengarhar Province.
- Meeting with community representatives at MAIL-Nengarhar Office
- No. of members present: 3
- Represented District: Dara e Noor
- Please refer to questionnaires for more detail about communities.
- Meeting with Afghanistan For Tomorrow (AFT)
- AFT was introduced to us by MAIL Nengarhar Director of Planning, Mr. Bashary.
- Afghan NGO working on Briquette technology demonstration and deployment
- Has received funding from UNDP under small grants by GEF

- They have introduced a technology which makes these briquettes from waste paper, agricultural residues, sawdust and other similar material. These briquettes have higher energy density and are very environmentally friendly.
- AFT focuses on disabled people to run these machines and either sell the briquettes or for own consumption.
- AFT have so far provided these machines for two locations in Nengarhar (One in the city of Jalalabad and one in one of IDP camps).
- In addition to the equipment, trainings have also been conducted to the users.
- MADERA: French NGO
- *Meeting with:* Eng. Ajab Khan Omerkhil – Provincial Coordinator Nengarhar
- +93 700 61 79 79
- *Meeting Minutes:*
- Madera is one of the longest running NGOs in Afghanistan doing a lot of projects in agriculture and forestation.
- They have only had one project in Nengarhar Province. It was rehabilitation of one garden in Khewa District.
- Their main projects include home based nurseries in Laghman and Kunar Provinces.
- MADERA hasn't done any biogas projects.

9.5 Appendix Parwan Mission Report

Date: Oct 20-22, 2014

Members:

- Hamidullah Akbary – FAO/AF/GEF – National Forestry Expert
- Ahmad Murtaza Ershad – FAO/AF/GEF – National Institutional & Policy Expert

Mission Objectives:

- ☐ Introduce project to provincial MAIL, NEPA, MRRD, Mew, ME provincial directors
- ☐ Identify and coordination with NEPA, MAIL and other stakeholders during the project site selection
- ☐ Strengthen coordination between PMU and Provincial authorities for future cooperation on project execution.
- ☐ Facilitating establishment of Provincial Coordination Team (PCT) after acquiring political support of Governor.
- ☐ Gathering information on site security for project execution areas
- ☐ Identifying which agencies e.g. CDC, Shura, NGO (national/international) are currently present in Parwan province
- ☐ Consider if these agencies have capacity to support project implementation e.g. with information, coordination, or direct roles in project implementation
- ☐ Discuss appropriate approaches to CBNRM – consider how to build community resilience, develop capacity and support livelihoods in Parwan Discuss appropriate approaches to efficient biomass technologies.
- ☐ Conduct meetings with local and international NGOs to coordinate for future collaboration, and to gather information that will support project
- ☐ Identify available CDCs /FMCs
- ☐ Best-practices, lessons learned, data and information from previous
- ☐ Conduct meeting with CDCs to collect information that will guide the implementation of the project.
- ☐ Information needs particularly relate to forestry and natural resource use, and use of biomass and other fuels for domestic energy

Meetings:

Monday, Oct 20, 2014

- Parwan Department of Natural Resources Management (NRM)

Meeting with: Mr. Azim and his staff – Head

Meeting Minutes:

- Project was introduced by Mr. Akbari to Parwan NRM Department.
- NRM Department was asked to contact community members to be interviewed.
- Mr. Azim proposed a meeting with Department of Economy of Parwan province since all DEO should be briefed regarding all development projects in the province.
- NRM department showed willingness for future cooperation.

- Parwan Department of Economy

- *Meeting with:* Sulaiman Shams, Head of Auditing Department
 - Tel No: 0774118396

• *Meeting Minutes:*

- Project's objectives and goal were introduced by Mr. Akbari in the target areas.
- Mr. Shams fully agreed with our objectives and showed his full cooperation.

- Mr. Shams was very happy that we met with him and shared with him our project goals because he said sharing our ideas with different organizations helps prevent from duplication and other inter-institutional issues.

Tuesday, Oct 21, 2014

- Parwan Department of Agriculture, Irrigation and Livestock (DAIL)
- *Meeting with:* Abdul Kabir Farzam – Director of Parwan DAIL
- *Meeting Minutes:*
- Project was introduced by Mr. Akbari and Murtaza.
- DAIL showed willingness for future cooperation especially in the area of implementation and coordination of the project.
- Regarding ideal sites, he recommended Salang District very highly and didn't recommend Ghorband District due to security issues.
- He emphasized that we increase people's interest in these kind of activities since people do not trust a lot of these organizations implementing very unsustainable projects.
- Salang District Deputy Governor
- *Meeting with:* Mohammad Alem
- *Telephone No:* +93770711758
- *Meeting Minutes:*
- Deputy Governor was briefed with regard to our potential project in Salang District and the reasons why we chose Salang as one of our pilot sites.
- He assured us that security will not be a problem during implementation of the project.
- He added that the Salang people have very limited agricultural land since a lot there are a lot of mountains and rocks. This has caused a lot of migration to neighboring countries in the fall season.
- He also liked our project because of its job creation potential.
- In the meeting, about 18 people were present and most of them were community members that came there to be interviewed.
- 6 community members were interviewed from three villages of Honamak, Aghel Khan and Nawaj.
- Parwan National Environmental Protection Agency (NEPA)
- *Meeting with:* Mr. Hafiz Kohistani
- *Meeting Minutes:*
- Project was introduced very briefly by Mr. Akbari and Murtaza.
- Parwan NEPA appreciated our sharing our project ideas and goals them.
- In the meantime, Parwan NEPA showed willingness for future cooperation especially in the area of coordination.

Wednesday, October 22, 2014

- Parwan Department of Agriculture, Irrigation and Livestock (DAIL)
- *Meeting with:* Abdul Kabir Farzam – Director of Parwan DAIL
- *Meeting Minutes:*
- The goal of the second meeting with DAIL Directorate was to emphasize the institutional arrangement for the project and what kind of roles would Parwan DAIL would want to play during the implementation phase of the project.
- DAIL Director mentioned that they have enough skilled technicians and experience in fields of making Qorogh and artificial forests that our project could benefit from.

- Meeting with community representatives from Ghorband and Shinwari District at Parwan DAIL
- Although our focus was not to interview community members from other districts except Salang, we thought it useful to know more about other districts.
- One community member from both districts were interviewed.
- Parwan MRRD
- *Meeting with:* Abdul Wassay Azizi
- *Meeting Minutes:*
- Introductory meeting was conducted with Director of Parwan MRRD.
- Mr. Azizi was very excited to hear about our project as he is a big fan of biogas technology.
- He mentioned that so far no biogas project was implemented by his department. However, he shared his knowledge of a large scale community biogas digester in the neighboring province of Kapisa. He said we have some knowledge of biogas technology and could help in the implementation phase with construction.
- He highly emphasized in consulting with community members before implementation of any kind of projects and said local ownership and solutions are keys to successful projects.
- There are 831 CDCs and 10 DDA under his control.

APPENDIX 10: APPROACH TO ESTIMATING REDUCTIONS OF GREENHOUSE GAS EMISSIONS AS A RESULT OF PROJECT ACTIVITIES

Elaboration of approach to reducing net GHG emissions

The project will reduce emission of greenhouse gases (GHGs) through two broad mechanisms, namely: i) improved management of forests, pastures and other natural ecosystems within Component 2; and ii) reduced net household use of biomass fuels within Component 3. These two components will be implemented in a coordinated and integrated approach that cumulatively reduces the overall demand for biomass fuel while simultaneously increasing the overall supply of biomass fuel, primarily as wood from sustainable managed forests and woodlands. The project's activities will be implemented in at least two pilot districts, namely Salang in Parwan province and Dara-e-Noor in Nangerhar province, in a phased process that begins with a small-scale pilot approach in Year 1 and which is gradually upscaled to a larger area over the course of Years 2 and 3.

The activities of the project through which these components will be undertaken are designed to address two significant sources of GHG emission in Afghanistan, namely the sectors of LULUCF (land use, land use change and forestry) and household energy. The estimated rate of baseline GHG emissions from these sectors are elaborated previously in Appendix 8 and Appendix 9. The project's approach to reducing GHG emissions under Components 2 and 3 are detailed in the sub-sections below.

10.1 Component 2, Outcome 2: GHG emissions avoided through sustainable forest management (SFM) principles and methods adopted in community forests located in 2 pilot areas

Within this component, the project will support the design and implementation of sustainable management plans for natural resources, including forests, woodlands and pasture/rangelands, by community Forest Management Committees (FMCs) in two pilot districts (henceforth referred to as Community Based Natural Resource Management, CBNRM, in the context of this project's activities). The proposed targets for spatial area to be included within CBNRM plans is ~12,000 ha in each of two pilot districts, namely Salang district in Parwan province and Dara-e-Noor district in Nangerhar province. It is anticipated that the activities under Outcome 2 will result in net reductions in GHG emissions as a result of three main effects: i) reduced rate of deforestation/degradation and resultant emission of GHGs, relative to the baseline; ii) increased sequestration of carbon as a result of improved management of forests, woodlands and rangelands; and iii) increased sequestration of carbon as a result of reforestation, enrichment planting, or establishment of woodlots to supply firewood to households.

Therefore, in order to estimate the potential reduction of GHGs resulting from the project interventions, the following variables need to be defined: i) spatial extent of project area; ii) baseline emission of GHGs resulting from deforestation/degradation in the project areas; and iii) estimated mean annual increments¹ from vegetation types in the project areas.

10.1.2 Proposed targets for number of communities and spatial area of project activities

The activities under Component 2 are designed to be complementary to Component 3 of this project, and should be undertaken in a phased approach that includes a small group of communities in the first year of implementation and gradually expands to reach a larger group of neighbouring communities in subsequent years. In consequence, the targets for number of participants and spatial area of land to be included in the project's activities should be set according to what is feasible under both components.

Considering that the main objective of Component 2 is to promote the implementation of CBNRM by FMCs, it is proposed that the targets for total spatial area and number of participating households/communities should be based on the likely number of FMCs that can be included in the project. In Dara-e-Noor and Salang, a total of six FMCs have been established to date and represent approximately ~35,000 people and ~14,000 ha of forest. Based on existing data for five out of the six

¹ The annual rate of production of woody biomass per hectare

FMCs, each FMC represents an average of 4–5 CDCs and an area of ~2,400 ha¹. The proposed targets for Component 3 aim to engage at least ~20 CDCs in each of the two Provinces. Therefore a target of ~20 CDCs under Component 3 is approximately equivalent to an area of ~12,000 ha to be managed by FMCs through development of CBNRM plans under Component 3, in each of the respective pilot districts.

Therefore, the proposed target for project activities under Component 2 is to include at least 12,000 ha of forest, woodland and rangeland within CBNRM plans, in each of the two pilot districts (i.e. a total of 24,000 ha to be managed under CBNRM).

10.1.3 Baseline rate of emission of GHGs from land use change in project area

Method for estimating GHG emissions from land use change

The estimation of rates of deforestation and degradation is challenged by a lack of data on land use change and biomass stocks, as described previously. Consequently, estimated rates of deforestation and degradation are derived from analysis of land cover change in the pilot areas, based on the 2010 Land Cover Map. These analyses and supporting assumptions were used to estimate annual loss of biomass and annual deforestation rate in the pilot districts and are detailed in Appendix 8, particularly Section 8.3.3.

The analyses undertaken in Appendix 8 allow for two possible approaches to estimating GHG reductions from land use change, one based on assumed rate of deforestation and the other based on net removal of biomass. Considering the limited availability of data, the figures calculated for assumed rate of deforestation were considered to be unreliable for the purposes of estimating GHG emissions from land use change. The use of a ‘% deforestation’-based estimate of GHG emissions would potentially result in biased estimates of GHG emissions because this approach would result in an underestimation of the biomass lost from dense forest cover and converted to open forest cover. Furthermore, the use of % deforestation rate would require the category of ‘undifferentiated trees’ to be ignored from the analysis since this vegetation category was not assessed in 1993.

Therefore, the preferred approach to estimating GHG emissions from land use in the pilot districts is based on the total loss of biomass, including both net reductions in forest cover as well as conversion of dense woody cover to open woody cover.

Annual baseline emission of GHGs resulting from land use change in pilot districts

The analyses in Appendix 8 indicated that the total removal of woody biomass vegetation in the period 1993 – 2010 was equivalent to emission of ~**373,000 tonnes** of CO₂equivalent per annum in Nangerhar and ~**123,000 tonnes** of CO₂equivalent per annum in Parwan province². To estimate the annual baseline emission of GHGs from pilot district areas, the annual emissions from land use in pilot provinces were converted to emissions/hectare. The total area of Nangerhar and Parwan provinces are 772,700 ha and 597,400 ha, respectively. Therefore, the estimated annual baseline emissions from pilot project districts are equivalent to ~**0.48** and **0.21** tonnes CO₂e/ha. It is assumed that this rate of emission of GHGs can be attributed to the combined effects of deforestation and degradation and is consistent across the provinces, and can therefore be assumed to be similar in the pilot districts.

Considering that:

- i) the proposed project areas are 12,000 hectares each in Dara-e-Noor district, Nangerhar and Salang district, Parwan; and
- ii) the annual rate of baseline emissions from land use is ~**0.48** and **0.21** tonnes CO₂e/ha in Nangerhar and Parwan, respectively; therefore,

the total annual baseline emissions from land use resulting from deforestation and degradation within two pilot project areas of 12,000 hectares each, is equivalent to:

¹ If 59 CDCs represent 88,000 people, therefore the ~35,000 people within FMCs are representative of 88/35 = 23 CDCs.

² Assuming biomass carbon content of ~50% and total conversion to CO₂ as opposed to other GHGs.

- i) **5,786 tonnes CO₂e/hectare/year** in Dara-e-Noor, Nangerhar; and
- ii) **2,476 tonnes CO₂e/hectare/year** in Salang, Parwan.

The summed emissions of GHGs over the three-year project implementation period and an assumed long-term period of 20 years are summarised in the table below.

Table A10.1. Summary of emissions of GHGs resulting from land use change over three year period in project areas.

Period	Emissions (tonnes CO ₂ e/pilot area)		
	Dara-e-Noor	Salang	Total
Annually	5,786	2,477	8,263
Year 1 – 3	17,358	7,430	24,788
Year 1- 20	115,722	49,530	165,253

Consequently, it is estimated that the total emissions from deforestation in the pilot project areas (two areas, each extending across ~12,000 ha) is equivalent to **~24,788 tonnes CO₂e** during the project implementation period and **~165,253 tonnes CO₂e** over a 20-year period.

10.1.3 Proposed approach to reducing GHG emissions from land use in project area

A fundamental principle of the CBNRM plans is the active participation of the communities in the selection of priority activities to be implemented. The selection of locally appropriate communities that will foster a sense of ownership and ‘buy in’ is critical to supporting the sustainability of project investments. The process of activity selection should begin with an exercise of participatory mapping, in which FMC representatives collectively apply their knowledge of the management area to establish clear management plans and priority activities. The maps will provide detailed, local-level information that will inform the selection of activities, for example by identifying: i) priority areas for restoration and conservation; ii) specific high-value species or products; iii) areas which are appropriate for grazing of livestock; iv) hazardous or degraded sites; or v) suitable sites for establishment of woodlots.

Consequently, considering that the management plans will be designed according to the needs of multiple FMCs within each of the two pilot areas, it is likely that the activities prioritised within each management plan will differ between and within the two pilot areas. Activities that will increase forest carbon stocks or reduce net emission of GHGs may be summarised into the following categories: i) adoption of management practices to reduce the unsustainable rate of exploitation of specific resources to an agreed sustainable harvesting rate; ii) enhancement of productivity through selective management practices or revegetation/reforestation; iv) total protection or exclusion of specific areas from disturbance; and v) reduced pressure on natural resources through establishment of plantations or artificial woodlots. Potential activities to be implemented within each CBNRM plan may include, *inter alia*:

- Introduction of sustainable harvesting plans for specific timbers or products e.g. firewood, fruits and nuts, fodder plants etc.;
- Reforestation/revegetation and enrichment planting, by direct seeding or with nursery-raised plants;
- Management practices to increase forest productivity, such as selective thinning and harvesting, removal of dead wood and surface litter etc.;
- Introduction of systems for rotational harvesting and grazing;
- Introduction of forest guards and patrolling to enforce management plans and reduce illegal harvesting;
- Establishment of exclosures and fencing to reduce access and grazing; and
- Establishment of managed woodlots to provide supplementary timber and firewood close to the household.

10.1.4 Total baseline emission of GHGs resulting from land use change in the project scenario

As described above, the selection of priority activities to be implemented at project sites – and the resultant emission of GHGs – is likely to vary considerably between pilot sites. Considering that the baseline emissions for GHG emissions were estimated based on net historical loss of biomass (see 10.1.2 above), the estimation of emissions under the project scenario can be calculated using a similar approach. Under the project scenario, the introduction of sustainable management practices to forest, woodland and rangeland areas within the CBNRM plans will aim to reduce total emissions from deforestation and degradation to 0 i.e. to reduce the emission of GHGs from land use change in Dara-e-Noor and Salang project areas by ~**0.48** and **0.21** tonnes CO₂e/ha/year, respectively¹. This target is based on the principle of limiting the rate of exploitation of natural resources (e.g. firewood) to an equivalent annual rate of recovery.

Based on principles used under IPCC guidelines, non-renewable biomass can be defined as the difference between total rate of removal and total annual rate of productivity (termed the ‘mean annual increment’, MAI, in forestry). The default MAI for closed evergreen forest is 3 tonnes of woody biomass per hectare². Considering the reported widespread degradation of closed evergreen forest (Appendix 8), it is conservatively assumed that the average MAI of evergreen and undifferentiated forests is ~1.5 tonne of woody biomass per hectare, or ~2.7 tonnes CO₂e/ha/year. In the absence of default MAI estimates for areas such as rangelands and shrubland/degenerated forest, a conservative estimate of ~0.5 tonnes/ha/year of woody biomass and ~0.9 tonnes/ha/year of CO₂e/ha/year is assumed for the latter vegetation categories. The average MAI assumed for Nangerhar and Parwan project sites is detailed in table A10.2 below.

Table A10.2. The average MAI for Nangerhar and Parwan project sites.

Province	Vegetation class	Area (ha)	MAI (tonnes wood/ha/year)		Average MAI (tonnes CO ₂ e/ha/year)
			Specific	Average	
Nangerhar	Closed and open forests	59,382	1.5	0.67	1.23
	Shrubland/degenerate forest	4,082	0.5		
	Rangeland	281,032			
Parwan	Closed and open forests	76	1.5	0.50	0.92
	Shrubland/degenerate forest	836	0.5		
	Rangeland	408,741			

The average MAIs for the project sites are calculated as 1.23 and 0.92 tonnes CO₂e/ha/year in Nangerhar and Parwan, which is greater than the calculated rate of biomass removals (0.48 and 0.21 tonnes CO₂e/ha/year). This result suggests that the analysis of baseline GHG emissions (previous section) has underestimated the total rate of biomass removals, considering: i) the net loss of forest observed in the comparisons of land cover data; ii) the widespread reports of deforestation and degradation, described previously; and ii) the large household demands for woodfuel, described in Appendix 8. It could be expected that forest cover would increase, rather than decrease as observed, if (MAI) > (annual biomass removals).

In consequence, it is considered feasible for the project targets for reduced GHG emissions to be based on neutralising the net emission of GHGs from land use relative to the baseline scenario (see 10.1.2). In other words, the project activities should aim to reduce net emissions from forest, woodland and rangeland areas to 0 tonnes/ha/year. Over the three year project implementation period, the proposed target for GHG emission reductions under Component 2 is ~**24,788 tonnes CO₂e**, equivalent to ~**165,253 tonnes CO₂e** over avoided over a 20-year period (as detailed in 10.1.2).

¹ Equivalent to 5,786 tonnes CO₂e/hectare/year and 2,476 tonnes CO₂e/hectare/year across project sites of ~12,000 hectares in Dara-e-Noor and Salang, respectively

² IPCC Good Practice Guidelines for LULUCF. Chapter 3: LUCF Sector Good Practice Guidance, Appendix 3A.1 Biomass Default Tables for Section 3.2 Forest Land

It is likely that the above estimates of GHG reductions from reducing degradation and deforestation are conservative and that additional GHG benefits may be generated through the increased accumulation of biomass, particularly at sites which have been protected from grazing or other harvesting. Following the three year project implementation period, it is anticipated that the benefits of the project's interventions will be sustained as the socio-economic benefits of improved NRM incentivise continued adherence to the CBNRM plans. If it is assumed that the initial period of CBNRM practice reduces the net rate of biomass loss to 0 (as described above), then the following years beyond the project implementation period could be expected to generate additional accumulation of biomass. It is conservatively assumed that up to 50% of MAI will be accumulated as woody biomass in the period after project implementation, while the other 50% may be sustainably harvested or utilised. The estimated emission reductions from the increased sequestration of carbon as biomass in the period after project implementation is summarised in the table below.

Table A10.3. Summary of the estimated emission reductions from increased carbon sequestration as biomass.

Province	Average MAI (tonnes CO ₂ e/ha/year)	50% of average MAI (tonnes CO ₂ e/ha/year)	Total annual biomass accumulated (tonnes CO ₂ e/year)	Total woody biomass accumulated in year 3-20 (tonnes CO ₂ e)
Nangerhar	1.23	0.62	14,792	251,468
Parwan	0.92	0.46	11,004	187,070
Total				438,537

Based on the assumption that up to half of the MAI is accumulated as unharvested woody biomass in the period following the project implementation period (from Year 3 to Year 20, up to 20 years after the project inception), the total sequestration of carbon is estimated to be ~251,000 and ~187,000 CO₂e in total.

10.2 Component 3, Outcome 2: GHG emissions avoided through innovative and sustainable biomass energy technologies, tested and deployed in 2 pilot areas.

Within this component, the project will promote the adoption of alternative approaches and improved household technologies for efficient domestic use of biomass.

10.2.1 Elaboration of approach to reducing domestic use of biomass fuel

During the PPG phase, consultations with national stakeholders and interviews with community representatives emphasised the complexity of domestic fuel use habits. Biomass fuels, particularly firewood, charcoal and animal dung, are overwhelmingly the dominant fuel used for most domestic applications, particularly in poor rural households. However, the type of biomass fuel, and the amount used, varies considerably according to climate, season, cooking preferences, household income and availability of preferred fuel types. Households may use a combination of several different methods for domestic applications such as heating the household, warming water and cooking food. As a result, it should be noted that an accurate assessment of household fuel consumption at any given location or project area should include: i) several sampling periods, to account for seasonal differences; and ii) physical measurements of mass or volume of fuel used, to account for reporting bias.

Based on the household surveys and literature review detailed in Appendix 9 above, the average consumption of fuel and resultant emission of GHGs in the pilot districts was estimated as follows:

Table A10.4. Dara-e-Noor, Nangerhar province

Fuel type	Annual household consumption (kg/year)	Annual per capita consumption (kg/person/year)	Annual household CO ₂ emission (kg/year)	Annual per capita CO ₂ emission (kg/person/year)
Dung	1,277.5	197.4	2,344.2	362.3
Firewood	3,619.6	559.4	6,641.9	1026.6
Total			8,986.1	1,388.9

Table A10.5. Salang, Parwan province

Fuel type	Annual household consumption (kg/year)	Annual per capita consumption (kg/person/year)	Annual household CO ₂ emission (kg/year)	Annual per capita CO ₂ emission (kg/person/year)
Dung	1,277.5	214.7	2,344.2	394.0
Firewood	3,619.6	452.4	6,641.9	830.2
Brush	1,277.5	214.7	2,344.2	394.0
Charcoal	2,433.3	304.2	4,465.2	558.1
Total			15,795.5	2,176.4

The dramatic use of biomass fuels in the pilot areas highlights the urgent need to introduce technologies and complementary awareness-raising activities to encourage a more sustainable and efficient approach to domestic energy use. Consequently, the project will introduce pilot demonstrations of alternative, fuel-efficient energy systems for household cooking and heating (henceforth collectively referred to as Sustainable Biomass Energy Systems, SBES, in the context of this project).

10.2.2 Identification of SBES to be demonstrated

Based on a literature review and assessments of past projects (detailed further in Appendix 7) and the assessments of PPG team members during national and provincial consultations (Appendix 9), the following SBESs were identified as suitable technologies which are well-adapted to the project concept:

1. Low-cost fuel-efficient cooking stoves (FECs), to be produced by local tinsmiths and sold to households in participating communities at a partially subsidised price. FECs mainly reduce the

consumption of woodfuel relative to unimproved/traditional cooking methods through: i) improved insulation, thereby reducing loss of heat to atmosphere; and ii) improved fit of cooking pot with stovetop, thereby increasing efficiency of heat transfer to the cooking pot. It is anticipated that FECs will mainly contribute to reduced household fuel use during the warmer seasons of the year when household energy needs do not include significant requirements for heating the homestead. However, in consequence it is likely that FECs will not contribute to reducing household energy consumption during the winter, since households will prefer traditional methods such as *tandoor* which can be used for both cooking and heating.

The design of FEC to be piloted will be based on the model of stove piloted under the USAID ILGNRM project (see main project document for further detail)¹. Cost of the stoves is estimated to be ~USD 40, including both procurement of material and payment for the labour of artisanal tinsmiths. In the aforementioned project, most households estimated that use of cooking fuel was reduced by at least ~25% using this FEC. This style of stove has been adapted to allow for the cooking of traditional *naan* flatbreads which contributed to the uptake of this stove design by communities in the project area.

2. Low-cost fuel-efficient *bukhari* stoves (FEBs), to be produced by local tinsmiths and sold to households in participating communities at a partially subsidised price. The design and versatility of these traditional heating stoves is variable between households and regions. It is anticipated that FEBs will mainly contribute to reduced household fuel use during the winter periods, when households will favour the use of systems that can contribute to household heating. However, the project will favour a design of *bukhari* that includes stovetop apertures to allow for cooking and warming of water to be undertaken at the same time.

No studies have been undertaken to estimate the efficiency of traditional or improved *bukhari* in Afghanistan. However, previous projects undertaken in Pakistan, where the *bukhari* is used traditionally, indicate that total household fuel consumption can be reduced by up to ~50% (from ~6kg per day to ~3kg)². It will be assumed that FEBs will reduce household fuel use by up to ~25% in consideration of the likelihood that: i) households which receive FEBs will still practice traditional methods such as *tandoor* for cooking certain dishes; and ii) FEBs will be less suitable for household use during summer when excessive heat in the household is uncomfortable.

Two designs of FEB that have previously been trialled in Afghanistan include: i) variant of UNICEF-designed *bukhari* distributed in IDP camps for cooking and heating, modified to increase efficiency through reduced internal volume, improved ventilation and re-arrangement of chimney flue; and ii) variant of AREA-designed *bukhari*, used mainly for household heating with potential applications for cooking and heating water. Both stove types were estimated to cost ~USD 15 for materials in 2002. To account for inflation of costs and an estimated labour cost of ~USD20–25, total production costs of FEB are estimated at ~USD 50³.

3. Household-scale biogas digesters, to be constructed *in situ* by community members with the support of trained local builders. Biogas digesters to be promoted by the project will be based on the design and approach advocated by the NGO BORDA, which has been developed specifically for the context of Afghan households. The estimated cost of materials for construction of the digesters (not including labour) is ~USD 600–800, which will be partially subsidised by the project as an incentive to promote adoption of the technology. Digesters will be promoted preferentially to wealthy and/or influential households in the area for the following reasons: i) initial investment costs are relatively

¹ USAID. 2013. Performance Evaluation: improving livelihoods and governance through natural resources management (ilgnrm) project, Afghanistan. Accessed on 31 October 2014. Available at: https://www.academia.edu/7808374/Performance_Evaluation_IMPROVING_LIVELIHOODS_AND_GOVERNANCE_THROUGH_NATURAL_RESOURCES_MANAGEMENT_ILGNRM_PROJECT_Afghanistan

² Escorts Foundation (1999). Fuel Efficient Smokeless Stoves, Pakistan. http://postconflict.unep.ch/humanitarianaction/documents/03_03-04_02-05.pdf

³ Ashmore, J. 2002. Analysis of heating and cooking fuels and stoves in refugee, IDP and local settlements, Kabul, Herat, Afghanistan March 2002. Accessed on: 31 October 2014. Available at: http://www.shelterproject.org/downloads/peer1rep/stoves_06_02.pdf

expensive for most households; ii) households with sufficient livestock animals to supply the digesters should be identified and prioritised; iii) households with the necessary cooking attachments for LPG fuels should be identified and prioritised to ensure compatibility with existing cooking methods and equipment; and iv) promotion of new technologies by influential community leaders will increase the credibility of the biogas digester system in the eyes of sceptical community members.

Although biogas digesters are a well-established technology in Afghanistan and globally, there is a lack of data to inform an accurate assessment of the energy production potential. This is partially a function of the biological and physical factors which determine the productivity of anaerobic digestion, which is influenced by factors such as atmospheric temperature, water availability and quality of feedstock. Based on a literature review^{1,2}, the productivity of a small-scale digester is estimated to be 0.3–0.5 m³ gas/m³ digester volume per day. The systems to be piloted by the project will have a dimensional capacity of ~9m³, therefore the production of gas is estimated to be 2.7–4.5 m³. The gas requirement for cooking is estimated to range from ~0.3–0.9 per person m³ i.e. ~2–5 m³ for a family of 6. Therefore the productivity of the proposed digester may not be sufficient to address all household energy needs such as heating, cooking and lighting. However, even in a conservative scenario the increased production of gas could contribute significantly to household cooking fuel.

For reasons outlined previously, it is highly unlikely that biogas digesters will completely displace traditional methods of cooking. Furthermore, this type of SBES is more appropriate for cooking and heating water than for heating the home, therefore the significant household demands for heating during winter are unlikely to be displaced. Nevertheless, it is assumed that a well-maintained biogas digester could reduce household use of biomass fuel for cooking and heating water by ~50%. Additional benefits of these systems is the improved indoor air quality and resultant health benefits of reduced smoke pollution. Furthermore, the systems produce a composted slurry of waste which can be used as an agricultural fertiliser.

The abovementioned SBESs offer several different approaches to reducing household energy demands. The FEC and FEB are low-cost SBES which are familiar to the majority of households and which are compatible with traditional approaches to cooking and heating. The systems have a limited lifespan, however they are cheap to manufacture and repair with local materials and labour. The biogas digester systems are a more expensive but longer-lived investment which can reduce household consumption of woodfuel and which can be readily retrofitted to existing LPG cooking systems. The project will promote each of these SBESs in an approach based on demonstration of concept and iterative improvement of design based on technical research and user feedback.

10.2.3 Phased approach to promoting SBES

The proposed project will be implemented in a phased approach, in which the first year of project implementation will be used to pilot the demonstration of SBESs in a small number of willing households within participating communities. This initial pilot phase will be used to sensitise communities to the potential benefits of the piloted technologies, thereby reducing local scepticism for unfamiliar or non-traditional approaches. Importantly, the initial pilot phase will be a critical period for assessing the suitability of the selected SBESs to the local context and a strong emphasis will be placed on consulting the participating households on the performance and suitability of the SBESs. Based on the experiences of past projects, this approach can potentially be used to improve the efficiency and user-friendliness of the designs by soliciting feedback from users.

Following the initial pilot phase of the first year of project implementation, the project will upscale the demonstration of successful SBES, both by increasing the number of SBESs in communities who participated in the first pilot phase and also by demonstrating SBES in new communities, replicating the approach undertaken in the first year. Finally, the third year of project implementation will see the

¹ GTZ (Editor) (1999): Biogas - Country Reports. (= Biogas Digest, 4). Information and Advisory Services on Appropriate Technology (ISAT) and German Agency for Technical Cooperation GmbH (GTZ)

² Werner, U. Stoehr, U. Hees., N. (1989): Biogas Plants in Animal Husbandry. German Appropriate Technology Exchange (GATE) and German Agency for Technical Cooperation (GTZ) GmbH . PDF

further replication and upscaling of successful approaches to include the participation of additional communities and households. The incremental phase promoted by the project is based on the recommendations of several stakeholders and past initiatives, most importantly the emphasis on ‘starting small’ and promoting successful approaches to interested communities. Importantly, this approach allows some flexibility with respect to the number of households and communities that will participate, and also with respect to the specific technologies that will be promoted in each of the two pilot districts. The proposed targeted number of SBES units to be distributed, and the number of communities to participate, is detailed further below.

10.2.4 Identification of participating communities and households

The activities under Component 2 and Component 3 are intended to be integrated and coordinated to benefit the same participating households and communities. Therefore the selection of communities and households to participate in activities relating to SBES promotion (Component 3) should include consideration of the suitability of communities to participate in CBNRM activities (Component 2).

The promotion of CBNRM under Component 2 aims to establish CBNRM plans through Forest Management Committees (FMCs), both by supporting existing FMCs and also by assisting with the establishment of new FMCs. In Component 3, the promotion of SBES should be undertaken through the representatives of the Community Development Councils (CDCs). Considering that FMCs typically represent several thousand people and may represent members of several CDCs, it is proposed that the selection of communities to participate should prioritise those that are represented by FMCs, or that are interested in establishing FMCs. By prioritising the participation of communities represented by FMCs, the project will have access to multiple neighbouring CDCs within a single FMC area.

10.2.5 Proposed annual targets for SBES distribution

As detailed above, the recommended approach to promoting SBES technologies is to pilot the demonstration activities on a small scale initially and then gradually upscale those activities which are successful in the pilot phase. Furthermore, considering the project’s integrated approach to promoting SBES in coordination with CBNRM, it is recommended to prioritise communities and households from neighbouring CDCs within a larger FMC area.

In Dara-e-Noor and Salang, approximately ~59 and 44 CDCs represent ~88,000 and ~45,000 people respectively (Appendix 9). Within those two districts, a total of 6 FMCs have been established but are not active yet. These FMCs represent ~35,000 people and 12,000 ha of forest. Based on existing data for population within CDCs, the area within the five FMCs is estimated to represent ~20–25 CDCs¹. Therefore, a community size of approximately 20–25 CDCs is representative of 12,000 ha of forest, which is consistent with the proposed targets for scale of CBNRM activities under Component 2.

Therefore, based on the observations above the proposed targets for SBES demonstration aim to increase annually over the three years of the project implementation period within a proposed minimum of 20 CDCs at each of two pilot sites. The proposed pilot phases in Years 1, 2 and 3 are detailed below.

In Year 1, the project will target the participation of ~10 CDCs in each pilot district, a total of 20. The biogas digesters, which are relatively expensive and time-consuming to construct, are anticipated to be more difficult to promote in all participating communities, therefore a target of ~5 communities to receive biogas digesters is proposed for the first year while the low-cost FECs should be promoted in ~10 communities in each pilot area. Based on stakeholder consultation and past project experience, it is recommended to install a minimum of 3 digesters in any community in order to increase the visibility of the system and to encourage community members to discuss the SBESs and share ideas.

¹ If 59 CDCs represent 88,000 people, therefore the ~35,000 people within FMCs are representative of $88/35 = 23$ CDCs.

Following the first year of project implementation, the technical performance and community impressions of the piloted technology will be assessed. This information can be used to update or revise the proposed implementation plan based on identification of successful approaches, potential improvements and community feedback on energy needs. Subsequently, the second phase of the implementation period, in Year 2, will focus on upscaling the project's activities within the participating communities as well as replicating the approach in additional neighbouring communities. The same approach to reviewing, updating and upscaling will be adopted for the final phase of project implementation in Year 3.

The programmatic approach to piloting and upscaling demonstration of SBES is proposed in the table below.

Table A10.6. Proposed programmatic approach to piloting and upscaling demonstration of SBES.

SBES	Number of locations (across two districts)	Units per location per year			Total number of new units	Cost per unit (\$)	Total cost (\$)
		Year 1	Year 2	Year 3			
PHASE 1, Year 1							
Biogas digesters	10	3			30	400	12,000
FE Bukhari	20	5			100	50	5,000
FE Cookstove	20	5			100	50	5,000
PHASE 2, Year 2							
Biogas digesters	10		3		30	400	12,000
FE Bukhari	40		10		400	50	20,000
FE Cookstove	40		10		400	50	20,000
PHASE 3, Year 3							
Biogas digesters	20			3	60	400	24,000
FE Bukhari	40			10	400	50	20,000
FE Cookstove	40			10	400	50	20,000
Total	40				1920		138,000

Consequently, an estimated 1,800 FE stoves and 120 biogas digesters will be distributed through the project's activities, thereby benefiting ~13,500–14,000 people in Dara-e-Noor and Salang districts.

10.2.4 Estimated GHG reductions as a result of SBES distribution

As described above, none of the technologies demonstrated by the project are expected to completely displace woodfuel. However, it is anticipated that each of the technologies has the potential to partially reduce the net usage of biomass fuel by: i) increasing efficiency of fuel use; or ii) displacing traditional woodfuel with alternative biomass fuels. The annual and cumulative reduction in GHG emissions resulting from activities related to promotion of SBESs was estimated using several assumptions.

To estimate the GHG reductions resulting from the distribution of SBES in the phased approach described above, the following assumptions were adopted: i) SBESs are maintained and utilised by beneficiary households; ii) low-cost SBESs have a lifetime equivalent to project implementation period; iii) for estimating potential emission reductions from use of FE *Bukhari* it was assumed that the difference between summer and winter woodfuel consumption is attributable only to heating requirements.

The assumed emissions reductions per household per year as a result of the adoption of SBESs are detailed below.

- **Fuel efficient *Bukhari***

Previous studies indicated that efficient FEBs could reduce woodfuel use from ~6kg to 3kg per day¹. It is assumed that this is only applicable in winter months. Further, it is assumed that these heaters would displace the use of *sandali* charcoal heaters in the case of Parwan province. Therefore, assumed emission reductions for use of efficient *bukhari* is estimated as 50% of emissions during winter.

- **Fuel efficient cooking stove**

Users of ILGNRM stove report reduced use for cooking 25%. It is assumed that FECs will not reduce emissions from household heating energy during winter months.

- **Biogas digester**

It is assumed that biogas digester can potentially displace up to 50% of cooking energy requirements. It is assumed that biogas will not reduce emissions from household heating energy during winter months.

Based on the above assumptions, the estimated annual emission reduction in both pilot areas are detailed in the table below on a per-household basis.

Table A10.7. Estimated annual reduction in pilot areas Dara-e-Noor and Salang.

Baseline	Project area	Baseline household emissions (t CO2e/year)	Average
	Dara-e-Noor	9	12.4
	Salang	16	
Alternative scenario: reduced household emissions (tCO2e/year avoided)			
FEB	Dara-e-Noor	2.4	3.8
	Salang	5.2	
FEC	Dara-e-Noor	2.2	2.5
	Salang	2.8	
Biogas	Dara-e-Noor	3.3	3.7
	Salang	4.2	

Consequently, it is estimated that each SBES can reduce annual household GHG emissions by over 2 t CO₂e. These estimates are the basis for calculating the total emissions reductions attributable to the project's activities over the implementation period.

Table A10.8. Estimated total emission reductions attributed to the project's activities.

Year distributed	# FEB/FEC units	Emissions/unit (t CO ₂ e/year)	# Biogas units	Emissions/unit (t CO ₂ e/year)	Total annual emission reductions (t CO ₂ e/year)	Total project emission reductions (t CO ₂ e) ²
1	200	3,2	30	3,7	746	2,239 ³
2	800	3,2	30	3,7	2,649	5,298 ⁴
3	800	3,2	60	3,7	2,761	2,761 ⁵
Total						10,297

As a result of the project's activities, emission of an estimated **10,297 tonnes CO₂e** will be avoided through the distribution of ~1920 SBES over the three year implementation period.

¹ Escorts Foundation (1999). Fuel Efficient Smokeless Stoves, Pakistan.

http://postconflict.unep.ch/humanitarianaction/documents/03_03-04_02-05.pdf

² Dependent on the year in which SBES was distributed

³ Assumes three years of operation

⁴ Assumes two years of operation

⁵ Assumes one year of operation

10.3 Total estimated reduction of GHGs as a result of project activities

The analyses undertaken in the previous sections of this appendix as well as appendices 7 – 9 have been summarised in the following table, which presents estimated GHG emissions in the baseline scenario and the alternative project scenario.

Table A10.9. Estimated GHG emissions in baseline and alternative scenario.

		Baseline emissions (tCO ₂ e/yr)	Project avoided emissions (AE) in tCO ₂ e			
			Avoided annual emissions	AE over project lifetime (3 years)	AE over yrs 4-20	Total AE from project sites
Dara-e-Noor	Emissions from land use change (12,000 ha)	5,786	-5,786	-17,358	-115,722	-133,080
	Emissions from household use of biomass fuel (20000 households)	8,986	-1,716	-5,149	-23,468	-28,617
			Project sequestration in tCO ₂ e			
			Additional annual sequestration	Additional sequestration over project lifetime	Additional sequestration over years 4-20	Total AE from project sites
	Carbon sequestration (12,000 ha)		-1,4792	-44,376	-251,468	-295,844
	Subtotal	14,772	-22,294	-66,883	-390,658	-457,541
Salang		Baseline emissions (tCO ₂ e/ yr)	Project avoided emissions (AE) in tCO ₂ e			
			Avoided annual emissions	AE over project lifetime (3 years)	AE over yrs 4-20	Total AE from project sites
	Emissions from land use change (12,000 ha)	2,477	-2,477	-7,433	-49,530	-56,963
	Emissions from household use of biomass fuel (20000 households)	315,911	-1,716	-5,149	-87,529	-92,677
			Project sequestration in tCO ₂ e			
			Additional annual sequestration	Additional sequestration over project lifetime	Additional sequestration over years 4-20	Total Sequestration from project sites
	Carbon sequestration (12,000 ha)		-11,004	-33,012	-187,070	-231,086
	Subtotal	318,388	-15,197	-45,594	-324,129	-380,726
	Total emissions	333,160	-37,491	-112,476	-714,787	-838,267

APPENDIX 11: REVIEW OF NATIONAL ENERGY AND RENEWABLE ENERGY SECTORS IN AFGHANISTAN

Institutional and Policy Assessment of Renewable Energy in Afghanistan

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1. INTRODUCTION

Renewable energy technologies could play an important role in the economic, social and environmental development of Afghanistan. Additionally, adopting renewable energy technologies and diversifying sources of energy production could address a number of challenges currently facing the country including *inter alia*: i) reliance of rural households on traditional fuels such as wood; ii) rising costs of fossil fuels; and iii) climate change. Afghanistan requires strong institutions, policies and targets in order to upscale renewable energy technologies and improve access to sustainable cooking and heating devices, affordable lighting, communication and refrigeration, improved public health and affordable energy for agricultural and other commercial activities. Thus, the objectives of this assessment are to: i) review the existing institutions in the field of renewable energy; ii) review renewable energy policies and targets in Afghanistan; and iii) identify institutional and policy gaps and recommend solutions.

2. CONTEXT

Afghanistan is located in south Asia bordering the Islamic Republic of Iran from the west, Pakistan from the south and east, China from the northeast and Tajikistan, Uzbekistan and Turkmenistan from the north. It is located between latitude 29°35' and 38°40' North and longitude 60° 31' and 75° 00' East. Afghanistan has an arid and semi-arid climate with rugged mountains and plains in the north and southwest (NOAA, 2008). The country's total land area is ~652,864 km². Afghanistan's population was estimated to be ~25 million in 2012-2013, with ~24% of the total population living in urban areas (CSO, 2014).

Afghanistan is one of the world's least developed countries and was ranked 175th on the United Nation's Human Development Index – the lowest ranking in Asia – in 2012 (UNDP, 2013). In 2008, 35% of the population was unemployed and 36% were recorded to be living under poverty line (CIA, 2014). The literacy rate in 2010 was ~30% but is projected to increase to 50% by 2015 (ACCU, 2010). Gross national income (GNI) per Afghan was US\$680 in 2012 (WB, n.d.). Foreign aid plays a major role in the economy. Afghanistan received more than US\$56 billion in development aid during 2002 and 2010, which represents ~78% of the country's gross domestic product (GDP) since 2003 (Fichtner, 2013). In addition, foreign aid made up 69% of the national budget for the Fiscal Year 2014–2015 (MoF, 2015).

In 2011, the gross consumption of electricity in Afghanistan was one of the lowest in the world at 140 kWh per capita (Fichtner, 2013). The average household's electricity consumption rate varies from 3000 kWh/year in Kabul Province, to 178 kWh/year in Ghor Province (Fichtner, 2013). On the other hand, gross electricity demand is growing at a rate of 8.7% per year as a result of the country's rising population, GDP and income levels, and increasing political and economic stability (Fichtner, 2013). Annual gross demand for electricity across the whole country is expected to increase from 3,531 GWh (2011) to 18,409 GWh (2032), and annual peak demand from 742 MW (2011) to 3,502 MW (2032) (Fichtner, 2013). This growth in demand means that Afghanistan will need about five times more electrical energy than was produced in 2011. Only 28% of the population was connected to electricity grid, this number is projected to reach to about 83% by 2032 (Fichtner, 2013).

Afghanistan does not have an interconnected centralized power system. However, the interconnection of all grid segments is proposed for year 2032 (Fichtner, 2013). Currently, there are many decentralized local grids and stand-alone systems such as solar PV and diesel generators. Installed capacity – not operating capacity – of existing grid-connected electricity generation assets reaches about 1,363 MW including imports from Tajikistan, Uzbekistan, Iran and Turkmenistan. Imports account for ~62% of total grid-connected capacity, while hydro power and thermal – diesel-fired – power plants make up the rest each having about the same share. Currently about 134 MW of

decentralized power generators are installed around the country mostly in rural areas, more than half of which is diesel generators. 13 MW of solar PV, 36.65 MW of micro-hydro power and about 200 KW of wind power make up the rest of Afghan decentralized generating capacity (MEW, 2013). With regard to biomass energy projects, so far only various types of efficient cook stoves have been distributed to the people and biogas digesters have been constructed. The number of biogas digesters installed in Afghanistan is ~500 units which have mainly installed by MRRD (about 300 units in the South), AREA¹ (about 100 units) and BORDA (5 x 9 m³) producing an annual average 1,896 to 2,654 MWh² of thermal energy for cooking, water heating and lighting.

Biomass is still the dominant fuel source in both urban and rural Afghanistan. 36.10% of the urban population and 97.10% of the rural population use solid fuels (GAFCC, 2014). 79.9% of Afghan residences use solid fuels for cooking, while this number is 97.4% for space heating (CSO, 2014). Urban households use liquefied petroleum gas (LPG) as their primary fuel for cooking, while firewood and charcoal are widely used for heating. Rural households use bushes, firewood and animal dung most frequently for cooking and heating. Table 1 shows the percentage of urban, rural and Kuchi residences that use solid fuels for heating and cooking.

Residence	Cooking	Heating
Urban	32.5	99.1
Rural	93.4	92.3
Kuchi	99.8	100
National	79.9	97.4

Table 1. Afghan population using solid fuels for cooking and heating

Other studies also show that in urban cities like Kandahar, the primary fuel type is wood (Mohammad, Shreshta, & Kumar, 2013). Average annual total energy – electrical and non-electrical – consumption of an urban household in Kandahar City was found to be 10.8 MWh out of which 8.4% is electrical energy used for lighting. About 71.9% of total residential energy consumption of an urban household in Kandahar was used for cooking followed by space heating (17.4 %) and lighting (10.5 %). Wood with an annual share of 58 % was the main fuel used for various applications such as cooking, space and water heating followed by LPG (32.07%) and other fuel types such as diesel, kerosene and charcoal. 22% of household expenditures are energy related in rich households making more than 30,000 Afs on a monthly basis. The values are 19% and 10% for middle income (15,000 Afs – 30,000 Afs) and low income (less than 15,000 Afs) families (Mohammad, Shreshta, & Kumar, 2013). Table 2 provides a breakdown of different fuel types for an urban household in Kandahar City.

Fuel Source	Household Annual Use	Unit	No. of Household Members	Per person annual use	Per person annual use (kWh)	End Use Application
Diesel	40	Liters/y	10	4	42.9	Lighting
Petrol	50	Liters/y	10	5	47.2	Lighting
Kerosene	16	Liters/y	10	1.6	14.7	Lighting
Firewood	1460	KG/y	10	146	567.6	Cooking and space heating
LPG	244	KG/y	10	24.4	311.7	Cooking and space heating
Charcoal	2	KG/y	10	0.2	1.6	Cooking

¹ Agency for Rehabilitation and Energy Conservation in Afghanistan

² Energy production from 500 units of 4 m³ and 6 m³ is calculated using 1 m³ biogas = 1.1 L petrol = 10.44 kWh using 1 L petrol = 34 MJ.

Coal	0.5	KG/y	10	0.05	0.3	Space heating
Total Per Person Non-Electrical Energy Consumption (kWh)					986	
Total Per Person Electrical Energy Consumption (kWh)					91	
Total Per Person Energy Consumption (kWh)					1,077	

Table 2. Annual energy consumption of an urban household in Kandahar City

It is estimated that ~85% of the non-electrical energy needs of rural households are met by traditional fuels such as firewood, animal dung or kerosene (ANRRRES, 2014). This trend has contributed to deforestation in Afghanistan. Based on UNEP estimates, each Afghan emits ~1.2 Tons of CO₂ per year, of which about 85% comes from burning of wood for cooking and heating.

Figure 1 shows the share of each fuel used for applications such as cooking, space and water heating in rural villages of Afghanistan. On average, a rural household in Afghanistan burns about 230 kg of wood per month in summer and 350 kg in winter. This is equivalent to an average of 3.5 Tons of wood per year which is equates to the emission of ~6.5 Tons of CO₂ into the atmosphere per year. Annual non-electrical energy consumption of a rural household is estimated to be about 8.8 MWh out of which 31% is required for space heating and 69% for cooking and water heating. This consumption trend causes the typical rural family to spend ~US\$240–340 per year to cover their non-electrical energy needs (MEW & MRRD, 2014). This represents an economic challenge to many Afghan families.

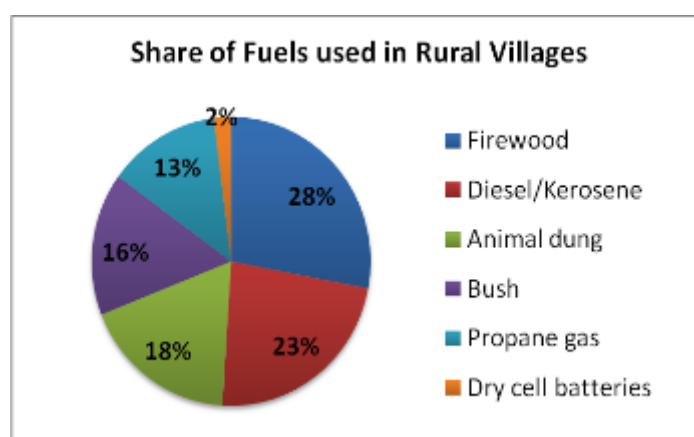


Figure 1. Share of fuels used in rural villages

3. INSTITUTIONS

Key government institutions responsible for the development of the energy sector in Afghanistan are the Ministry of Energy and Water (MEW) and the Ministry of Rural Rehabilitation and Development (MRRD). Although each of these institutions have distinct mandates there are times when they have to coordinate with each other. The Ministry of Finance (MoF) and the Ministry of Economy (MoEc) are concerned with planning and budgeting projects. Da Afghanistan Breshna Sherkat (DABS) is the only independent state-owned utility in the country. Figure 2 shows the arrangement in the rural energy sector. The following sections introduce some of the key institutions involved in the energy sector, particularly renewable energy.

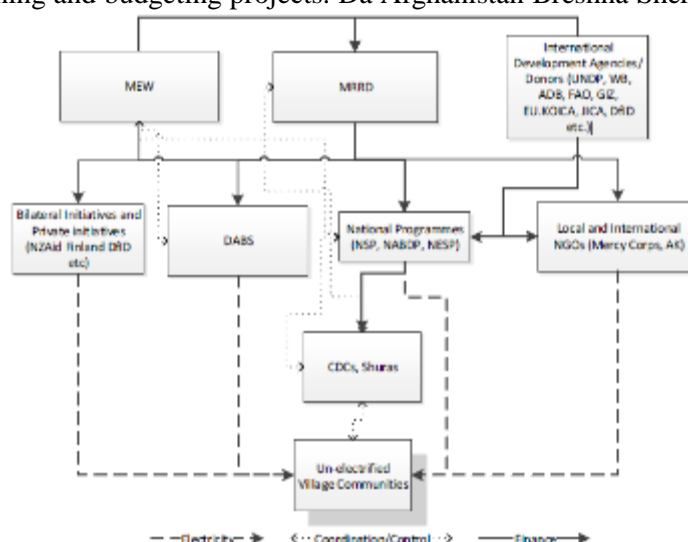


Figure 2. Institutional arrangement of rural energy sector (Courtesy of UNDP 2014¹)

3.1. Ministry of Energy and Water (MEW)

Some of the main roles of the MEW in developing the renewable energy sector in Afghanistan include *inter alia*: i) preparing policies, strategies, action plans and laws; ii) establishing platforms for decision making; iii) implementing renewable energy projects; and iii) assisting other developing agencies with security, land acquisition and licensing issues. The MEW is considered to be the nodal institution responsible for the development of renewable energy sector according to ANREP. The Ministry is mandated to develop, plan and implement renewable energy projects at the national, provincial and district levels. Implementation of projects greater than 200 kW is the mandate of MEW and other private utilities such as DABS, while projects smaller than 200 kW are the mandate of the MRRD. Renewable energy projects less than 15 kW are delicensed.

The Renewable Energy Department (RED), which was established in July of 2009, is the technical body involved in the development of renewable energy projects at the MEW. The Biomass Department within RED is the responsible department for the development of other departments involved in the sector of renewables in MEW are Energy Policy Directorate, and Energy Programming Directorate. The following are some of RED's scope of work:

- Assessing REN potential and preparing detailed resource maps.
- Preparing provincial level REN master plans.
- Developing technical designs, benchmarks and performance standards.
- Providing technical assistance and oversight to the MRRD, DABS and other government agencies in designing and implementation of their REN projects.
- Providing technical support to local industry and manufacturers on needs basis.
- Providing technology specific and other technical inputs to the MoF for designing fiscal incentives, specifically for facilitating the investment from the private sector.
- Designing and implementing pilot and demonstration projects that support either new technology or innovative concepts such as the Public-Private-People-partnership, women entrepreneur led REN projects, REN projects to support MDGs and Post-2015 Development Agenda, roof-top projects on government buildings.
- Coordinating with donors and other funding organizations to ensure synergy of projects.
- Facilitating technical training, awareness generation and capacity building of stakeholders across GOs and NGOs.

3.2. Ministry of Rural Rehabilitation and Development (MRRD)

MRRD is mandated to promote rural energy services as a mechanism to alleviate poverty and improve the livelihood of rural households. This mandate is at the village level. However, if there are projects

¹ Afghanistan-Sustainable Energy for Rural Development (ASERD) Project Document, UNDP, July 2014

that need to be implemented at the district level or provincial level or the scale of the project is bigger than what is specified (200 kW) in the policies, then MRRD coordinates with MEW and/or DABS. MRRD's District Development Plans (DDPs) considers rural energy as one of the priority demands of communities.

Rural Energy and Enterprise Development (REED) Directorate is responsible for the rural energy issues at MRRD. In addition, rural energy projects at MRRD are implemented through National Solidarity Program (NSP) funded by UNDP and National Area Based Development Program (NABDP)'s Energy for Rural Development in Afghanistan (ERDA). ERDA is being scaled up to a new program called Afghanistan Sustainable Energy for Rural Development (ASERD) by joint initiative of MRRD and UNDP for implementation of sub-component NPP-1 ARD Cluster. ASERD is supposed to start in 2015 and is targeting to provide energy services to about 110,000 households with a budget of 190 USD over five years. ASERD's main components are energy supply, policy, capacity building and piloting innovative technologies.

3.3. Da Afghanistan Breshna Sherkat (DABS)

DABS is the only independent state-owned utility in the country owning all of the central generation, distribution and transmission assets in Afghanistan. According to a MoU between the MEW, DABS and the MOF, DABS is responsible for operation and management of the power sector in Afghanistan. DABS was part of the MEW prior to 2008. The utility's primary focus is central grid-connected power generation units. The government owns shares of DABS through the Ministries of Energy and Water, Finance, Economy and Urban Development. MEW owns 35% of DABS's share. DABS bought US\$176 million of electricity from neighboring countries in 2013, and had forecasted another US\$205 million for 2014. This corresponds to 79% of energy supplied by DABS in 2014. DABS's financial assets amount to about US\$561 million and its net income is US\$20 million.

3.4. Inter-ministerial Commission for Energy (ICE)

The ICE was established by a Presidential Decree in 2006 for the purposes of donor and government stakeholder coordination of investment plans in the energy sector. The Commission is chaired by MoEc and its core members include the MEW, DABS, the MRRD, the MoF, and the MoMP. The ICE has been effective in investment and governance aspects of energy sector in Afghanistan coordinating five ministries, about 10 main development agencies and other private sector partners and civil society organizations. The ICE became inactive in 2012 as a result of a lack of funding. ADB reports that prior to its closure, the ICE "has proved to be the most effective and coherent mechanism to brainstorm and agree on an investment and governance agenda." In May, 2012, Afghan government approached ADB to support its efforts in coordinating the activities of its energy sector in: i) sector discussions; ii) sector planning and harmonization; iii) investment sequencing; and iv) analytical work related to Afghanistan's energy sector. The ICE was re-established under an ADB project (Project # 46347-001) that was approved in February 2013 in order to institutionalize it and assure its sustainability as nearly US\$5 billion grant money is estimated to go into the energy sector of Afghanistan during 2013–2015. ADB project to fund ICE's activities is planned to close on March 31, 2015. Impact, outcome and activities of ADB project # 46347-001 to reestablish and support ICE are described in the below paragraph taken from ADB Technical Assistance Report published in February 2013.

"The impact will be effective coordination between energy sector stakeholders in Afghanistan to boost the grid-connected electrification ratio from less than 25% in 2012 to 50% by 2020. The outcome will be greater capacity of energy managers to support sector coordination, integrated policy and planning, governance, and implementation through (i) annual updating of the power sector master plan and a 20-year Afghanistan energy investment program beginning in 2014; (ii) approval of the Afghanistan Electricity Law (including clear definition of roles of stakeholders, private sector participation, and regulatory regime) by December 2014; (iii) approval by the joint monitoring and coordination board of the Afghanistan National Energy Supply Program (Energy NPP) by December 2014; and (iv) institutionalization of the power sector master plan and establishment of a secretariat in MEW by December 2014."

The main output of this project is to reestablish the ICE to act as a unifying body in the energy sector. The ICE's has recently published its first quarterly (2014) report of the energy sector and has database of energy projects available on its official website.

3.5. Rural Energy Coordination Committee (RECC)

The RECC and its Technical Working Group (TWG) have been established to coordinate the efforts of the MEW, the MRRD and DABS in the field of rural renewable energy in Afghanistan. It is joint initiative between the MEW and the MRRD. The ICE Sub-Committee on Renewable Energy and Rural Electrification with the financial support of GIZ-ESRA established RECC and TWG in 2012. Although the ICE suspended in 2012, the RECC continued to receive funding. The RECC is chaired by both Deputy Ministers of the MEW and the MRRD. Currently, the RECC has one staff assigned by GIZ to manage the meeting.

The RECC and its TWG had planned to perform the following actions in 2014:

- Finalize and approve Rural Renewable Energy Policy;
- Finalize and approve Rural Renewable Energy Strategy;
- Conduct an awareness workshop of Rural Renewable Energy Policy;
- Develop the Standard Questionnaire for developing the Provincial Electrification concept and pave the road for the developing rural Electrification frame work;
- To overview the existing REN project in the country and select the best project out of them;
- Develop the initial Biomass Guideline;
- Develop the initial Wind Guideline; and
- Enhance the coordination of RECC with other coordination committees.

4. POLICIES AND TARGETS

The primary objectives of renewable energy policies globally include: i)_maintaining or expanding services; ii)_ improving energy access and security; and iii) reducing health and environmental impacts associated with energy use. Secondary objectives of such policies include improving opportunities for education, job creation, rural economic development, poverty reduction and gender equality. By early 2014, ~144 countries had renewable energy targets established and 138 countries had renewable energy support policies in place. Five out of six of Afghanistan's neighboring countries have generated some form of regulatory policies or financing mechanisms for renewable energy development (Table 3).

Country	Regulatory Policies/Public Financing/Fiscal Incentives
Pakistan	1. RE targets 2. FIT policy 3. Net metering policy 4. Capital subsidy and rebates 5. Public investment, loans or grants
Iran	1. Feed-in tariff (FIT) policy 2. Investment or production tax credits 3. Energy production payments 4. Public investment, loans or grants
Tajikistan	1. RE targets 2. FIT policy
Turkmenistan	None
Uzbekistan	1. Tendering policy

China	1. RE targets 2. FIT Policy 3. Renewable Portfolio Standard (RPS) 4. Tendering policy 5. Heat obligations 6. Biofuels obligations 7. Capital subsidy or rebate 8. Investment or production tax credits 9. Reduction in sales or energy taxes 10. Energy production payments 11. Public investment, loans or grants
India	1. RE targets 2. FIT Policy 3. Renewable Portfolio Standard (RPS) 4. Tendering policy 5. Heat obligations 6. Biofuels obligations 7. Capital subsidy or rebate 8. Investment or production tax credits 9. Energy production payments 10. Public investment, loans or grants

Table 3. Policies and financing mechanisms adopted in neighboring Asian countries as of the end of 2013

Most of the above policy documents focus on the power sector not the heat sector. However, some policy developments could be seen in the renewable heating and cooling sector as well. As of early 2014, ~24 countries had adopted renewable heating (and cooling) targets, and ~19 countries had obligations at the national or state/provincial level. Government rebates are available in some countries for the adoption of household biomass energy systems – such as biogas and fuel efficient cook stoves. Renewable heating and cooling is also supported through fiscal incentives, as well as through building codes and other measures at the national and local levels in several countries.

The importance of drafting policies and strategies for the renewable energy sector with the help of the international community has been recognized by Afghanistan. However, the focus has been mostly on electricity generation with a limited focus on affordable and efficient cooking and heating devices run on either renewable energy sources or traditional biomass. Table 4 shows the list of the documents that relate to renewable energy development drafted by the government and international community. The following sections summarize some of the below documents.

No.	Document	Year Drafted	Responsible Institution (s)	Status as of Jan 2015
1	Energy Sector Strategy	2008	MEW and MRRD	Adopted
2	National Energy Supply Program	2013	MEW	Adopted
3	National Water and Natural Resources Development Program	NA	MEW, MRRD, MAIL, MCN	Adopted
4	Rural Renewable Energy Policy	2013/2014	MEW, MRRD	Drafted/not adopted
5	Afghanistan National Renewable Energy Policy	2014	MEW	Drafted/not adopted
6	Afghanistan National Renewable and Rural Energy Strategy	2014	MEW, MRRD	Drafted/not adopted
7	Afghanistan Power Sector Master Plan	2013	MEW	Adopted

8	Energy Services Law	2014	MEW	Drafted/not adopted
9	Afghanistan National Renewable Energy Strategy	2014	MEW	Drafted/not adopted
10	Afghan National Renewable Energy Action Plan	2013	MEW	Adopted/to be amended
11	Renewable Energy Roadmap	2016	MEW	Not Drafted
12	Renewable Energy Market Study	2014	Mercy Corps	Drafted
13	MHP and Solar PV Installation Guideline	2014	MEW	Drafted/not adopted
14	Balkh, Takhar and Badakhshan Provincial Electrification Concepts	2013	MEW	Adopted

Table 4. Renewable energy development related documents in Afghanistan

4.1. Energy Sector Strategy (EES-2008)

The Energy Sector Strategy (ESS) was developed by the ANDS Secretariat and submitted for approval by sector responsible authorities (Ministers of Energy and Water, Rural Rehabilitation and Development and Mines) in 2008. The EES was developed for the energy sector under Pillar III, Infrastructure and Natural Resources, to achieve the third goal of ANDS, social and economic development. The focus of the EES is primarily on electricity generation as supposed to clean energy for cooking and heating. The following five pillars make the basis of the short-term strategies of the energy sector:

9. Increased Efficiency in Existing Operation.
10. Improved Sector Governance and Public-Private Partnership Promotion.
11. Improved Coordination and Capacity Development.
12. Rural Energy versus Rural Electrification.
13. Expanded or New Supply.

Over the long-term, the EES recommends that the government shifts its focus to cogeneration, distributed power, renewable energy, end-use energy efficiency and traditional energy supply schemes. EES emphasizes significantly on reduction of subsidies on projects and implementation of energy projects that generate income for the households not just meet their basic needs of lighting. However, the neediest will still gain access to energy through subsidized rates. Table 5 provides a summary of some of the main outcomes and activities of the EES regarding institutional and policy building in the energy sector:

Outcome	Actions or Activities
<i>An enabling environment for private sector investment in energy sector created</i>	Encouragement to Community Based Natural Resource Management for meeting energy needs of the people.
	Awareness generation of policy makers on the environmental issues so that they are taken care of in all projects in the energy sector.
	Establishment and operation of a regulatory authority
	Private sector promotion in renewable energy
	To maintain the highest level of transparency, accountability and integrity in the relationship between the public and private sector.
	Gender mainstreaming in the policies in the energy sector.
<i>Increased Access to Rural Energy Services</i>	Link rural energy with micro and small finance programs
	Develop a comprehensive and appropriate rural energy program
	Public awareness on rural energy opportunities, benefits, funding
	Assessment of priority areas based on income-generation opportunities
	Special attention to gender issues in providing energy for rural areas.
<i>Restructured Energy Sector</i>	Establishment of viable ICE working groups

<i>Governance and Commercialized operations</i>	Improved GoA, Donor & NGO Coordination
	Needs Assessment and Data Base
	Define Government roles in clearly defining TORs for MRRD and MEW on rural energy aspects
	Develop and implement the organizational structure and staffing plan for Rural Livelihoods and Energy Department (RLED)

Table 5. Parts of Energy Sector Strategy (ESS) Action Plan

4.2. National Energy Supply Program (NESP-2013)

The NESP is one of the 22 National Priority Programs (NPPs) that were agreed upon at the Kabul International Conference in 2010. The NESP is one of the four NPPs under the Infrastructure Development Cluster. The MEW is the primary executing ministry of the NESP, but is expected to coordinate with other related ministries and institutions such as DABS, MRRD, MAIL and NEPA. The primary objective of the NESP is to prepare and implement activities to achieve increased energy access and sufficient, reliable and affordable energy especially electrical energy.

The NESP has identified five major areas of investment in the energy sector and MEW is responsible to report progress made to the review program coordination board and Joint ordination and Monitoring Board (JCMB). The NESP is planned to be implemented during the period of January 2013 – December 2014. The cost for the plan is estimated to be around US\$3.5 billion. The five components of the NESP with corresponding budget requirements are presented on Table 6, below.

No.	Component	Budget (USD) Million
1	Energy Supply	1,921
2	Energy Transmission and Distribution	1,015
3	Energy Efficiency & Renewable Energy	59
4	Energy Institutions and Private Sector Participation	334
5	Capacity and Regulatory Framework Development	135
	Total Budget	3,465

Table 6. NESP components and estimated budget

With regard to improving institutional, policy and regulatory frameworks, the NESP outlines specific activities under Components 4 and 5. Some of the key outputs of these components are outlined below:

- The restructuring of energy institutions;
- Building regulatory and policy frameworks to support private sector participation;
- Building personal and institutional capacities of energy sector employees (DABS, the MEW and the MRRD staff) and the staff of private sector entities;
- Establishing a strong coordination, oversight, communication and management mechanism in the energy sector; and
- Building the educational capacities of universities and vocational training centers.

4.3. National Water and Natural Resources Development Program (NWNRD)

The NWNRD is one of the four NPPs under the Agriculture and Rural Development Cluster (ARD). The MEW, the MRRD, the MAIL and the MCI are the principle ministries of the ARD Cluster. The goal of the NWNRD program is to ensure the effective utilization of water and other natural resources and their proper management to foster agricultural productivity, safe drinking water and viable rural energy options. One of the main objectives of this program is to improve energy access in rural areas in order to improve livelihoods and create new sustainable jobs. Table 7 highlights the two components and sub-components of the NWNRD. The budgets for each component – as shown on

Table 7 – would be on-budget with funds from donors channeled either through ARTF (Afghanistan Reconstruction Trust Fund) or a special account.

Components (C) and Sub-Components (SC)	Budget (USD Million)
C 1: Water Resources and Irrigation Development	1,558.41
<i>SC 1: Institutional Reform and Capacity Development</i>	
<i>SC 2: Land and Water Monitoring</i>	
<i>SC 3: Irrigation Development</i>	
<i>SC 4: Water Resources Development and Management</i>	
<i>SC 5: Flood Protection and Management</i>	
<i>SC: Rural Water Supply, Sanitation and Hygiene Promotion</i>	
C 2: Environmental Management and Rural Energy	282.29
<i>SC 1: Biodiversity and Land Management</i>	
<i>SC 2: Energy for Rural Development in Afghanistan</i>	

Table 7. Components and sub-components of NWNRD

The main component dealing with energy is C1:SC2: Energy for Rural Development. The goal of the energy sub-component is to increase access to modern sources of energy in rural areas. Objectives include: i) designing rural energy projects together with a sustainable institutional framework; ii) ensuring the sustainability of these projects through capacity building; iii) the creation of community funds; and iv) establishment of service centers for operation and maintenance. The main outcome of C1:SC2 is to develop alternative energy sources to reduce the pressure of solid biomass in rural areas of Afghanistan. It is estimated that in ten years, 10% improvement will be met.

4.4. Rural Renewable Energy Policy (RREP-2013)

The RREP is drafted by the MEW and the MRRD with the strategic objective of creating better social, economic and environmental conditions for the rural population of Afghanistan. Other objectives of the RREP are to increase income generation of households by increasing energy access, provide affordable, clean and sustainable lighting, heating and cooking devices, reduce health and environmental impacts of energy use and improve opportunities for income generation, poverty alleviation and energy efficiency.

To attract private sector involvement and promote the sustainability of rural renewable energy projects, the government should: i) introduce regulatory measures such as legal frameworks for pricing and tariff structures; ii) enforce procedures to integrate local renewable energy schemes to the national grid; and iii) create power purchase agreements and grid codes. Safety and quality standards need to be developed by ANSA in coordination with the MRRD and the MEW regarding power generation, transmission and distribution.

The RREP is the first policy document that introduces an approach to the adoption of clean and sustainable biomass energy systems. Biogas is the only approach to sustainable biomass energy which is explicitly addressed in the RREP priorities for rural areas:

- Biogas will be promoted to replace the use of fuel wood and animal wastes as sources of energy for cooking.
- Emphasis will be given to research to increase efficiency, and to reduce the cost of household biogas production technology, including development and dissemination of community and institutional biogas plants.
- The establishment of biogas-related information centers will be encouraged in coordination with local institutions.
- Technology for the production of biomass gasification will be developed and disseminated through technology transfer.
- Consumption of biomass will be reduced and efficiency of woodfuel stoves enhanced by expanding the use and local production of fuel-efficient stoves.

4.5. Afghanistan National Renewable Energy Policy (ANREP-2014)

The ANREP was drafted with the initiation of the MEW's Energy Policy and Renewable Energy Directorates and the technical and financial support of GIZ with the overall objective of utilizing renewable energy sources in an optimized manner.

ANREP's targets have focused mostly on electricity generation with a limited focus on affordable and efficient cooking and heating devices run on either renewable energy sources or traditional biomass. However, its scope includes a number of stand-alone systems and devices for thermal energy. Biomass energy projects are on the list of priority projects that need to be implemented in Afghanistan. ANREP sets a power target of 350 MW–450 MW by 2032, however it does not stipulate any thermal energy targets. ANREP will be implemented over two terms: i) Term I (2015–2020) which will support the establishment of public-private partnerships (PPP) for the development of renewables; and ii) Term II (2021–2032) which will be dedicated to ensuring the full commercialization of renewable energy development.

With regard to institutional arrangements for the implementation of ANREP, it is expected that an Inter-ministerial Commission on Renewable Energy (ICRE) will be established to oversee the implementation of ANREP in the first term. Additionally, it is expected that this entity will develop into an independent decision making authority on renewable energy sources during the second term. ICRE is versioned to have statutory authority and be established by a presidential decree. In addition to ICRE at the national level, Zonal Renewable Energy Centers (ZRECs) will also be created to oversee the implementation of ANREP in various zones of Afghanistan.

4.6. Afghanistan National Renewable and Rural Energy Strategy (RRES-2014)

The RRES outlines Afghanistan's rural renewable energy action plans until 2020 and development objectives until 2032. The strategy focuses on the development of renewable energy sources for economic development of rural areas through increasing energy access. The main emphasis is on sustainable electricity schemes. Non-electrical energy needs are also covered in the strategy. The RRES was planned to be acknowledged by MEW and MRRD and published by December 31, 2014. However, as of now, it is not yet published. MEW-RED is the responsible body for the implementation and advancement of RRES and is also responsible for overseeing the milestones specified in RRES. MEW-RED is expected to lead the implementation of RRES in close collaboration with MRRD-REED and the rest of the stakeholders in the sector. RRES is meant to be a "hand-on approach" to address energy needs in rural areas and describes how measures determined by ANREP and RREP are implemented.

Specific targets and actions regarding rural households' access to clean fuels or improved thermal energy devices is limited in RRES. The only target is that at least 2 million people in rural Afghanistan have access to sustainable and alternative fuels for cooking and space heating and/or gain access to improved means of cooking and space heating using traditional biomass fuels. With regard to institutional development, the following actions need to be taken:

- It is intended that by 2020, Renewable Energy Development Authority (REDA) is established that would act as an independent implementing agency of renewable energy projects.
- The MEW-MRRD Technical Working Group (TWG) needs to be continued.
- The MEW-MRRD need to continue ICE Subcommittee on Rural Electrification and Renewable Energy (ICE-RE).
- Rural Energy Information Desk needs to be created in order to collect and disseminate renewable energy related information.

5. RECOMMENDATIONS

Limited coordination among institutions involved in RE development and commercialization, existence of dedicated government organizations and financing agencies, research institutes and organizations, microfinance institutions for consumer credit and clear policies and targets are identified to be some of the main barriers to the development of renewable energy in Afghanistan. The following are a few recommendations specific to institutional and policy development that will assist in the development of renewable energy technologies – particularly sustainable biomass energy systems – in Afghanistan.

1. The RREP and ANREP should be reviewed to include specific targets for affordable and efficient cooking and heating devices run on either renewable energy sources or traditional biomass especially with a Community Based Natural Resources Management (CBNRM) approach. Presently the main focus of these policy documents is electrification. Fortunately, FAO-GEF climate change mitigation project has activities to review existing policies.
2. Technology-specific policies with careful strategies should be developed and innovative programs should be designed. These policies should focus on renewable energy market development and private sector leadership, rather than government-led projects with very high rates of subsidies. For example, biomass policies could follow strategies such as introducing improved cookstove designs that make use of traditional biomass fuels rather than clean alternative fuels such as wood pellets and ethanol or other non-renewable sources such as LPG, coal and kerosene since these alternative fuels are not economically accessible. RREP is the first policy document that outlines a few approaches for the promotion of biogas in Afghanistan.
3. An independent, decision making and implementing agency such as Renewable Energy Development Authority (REDA) should be established for the development of renewable energy in Afghanistan. REDA is planned to be established by 2020 (RRES).
4. A dedicated financing institution should be established in order for the government to be able to incentivize rural clean cooking and heating technologies and electrification schemes to address the barriers of higher initial investment costs through loans, grants and tax reductions. These incentives can be financed through public and private financial resources. According to ANREP, such a dedicated institution shall be established during the period of 2021 – 2032. However, the government has to put more effort to make it happen much earlier than the targeted period.
5. In order to support the growth of market for renewable energy technologies, public-private Market Facilitating Organizations (MFO) should be established or existing ones strengthened at the national, provincial, district and village levels even. These MFOs should improve networking, financing and policy advocacy, user education, technical assistance, information dissemination and other activities that would help the market for renewables. These MFOs should also increase awareness among potential investors and business communities regarding business opportunities available in rural energy markets. BORDA, a German NOG, for example is the leading MFO for biogas in Afghanistan. FAO GEF climate change mitigation project is making use of BORDA as technical service provider to help with the project implementation. The replication of this model to strengthen existing MFOs is highly recommended.
6. Government, NGOs and the private sector are encouraged to incorporate innovative business models while implementing renewable energy projects. Public-private partnerships (PPPs), pay-as-you-go (PAYG) micro payments, one-stop shops (organizations both sell renewable energy products for a small down-payment and give loans for a period of time charged with interest rate), leasing (direct leasing and lease-to-own systems), franchise or service models are some of the existing models. Afghanistan Sustainable Energy for Rural Development (ASERD) program is already planning to implement a mini-grid project under PPP mode.

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APPENDIX 12: SITE SELECTION CRITERIA

During the PPG phase, stakeholder consultations included an emphasis on proposed site selection criteria and considerations for implementation. Based on these consultations, an extended list of site selection criteria was developed within eight broad themes. During the inception workshop, participants were provided with this draft list of selection criteria and were requested to participate in an exercise to identify the most important priority criteria for site selection. Based on the discussions which followed, the workshop participants identified ‘Safety and security’ and ‘Community participation and willingness’ as the most important criteria to be considered in site selection.

Based on these criteria, the provinces of Nangerhar and Parwan were proposed as the most suitable pilot provinces within the Eastern Forest Complex and the Central Highlands regions, respectively.

The extended site selection criteria and their associated rank of importance are presented in Table A12.1 below. It is recommended that these site selection criteria are consulted during the project implementation phase to re-validate the proposed pilot districts and provinces, and if necessary, to select alternative or additional sites over the course of implementation.

Table A12.1. Site selection criteria derived from Inception Workshop

Proposed site selection criteria	Ranking	Details
Sustainability and security	3	Security and stability in district/province Accessible to project management staff by road and/or air travel
Community participation and willingness	3	Demonstrated willingness of community to participate in project implementation and to try new approaches Demonstrated qualities of leadership and/or commitment within local community leaders History of cooperation and lack of conflict between community members e.g. with respect to natural resource management Level of community awareness of problems related to local degradation/deforestation
Ecological and environmental considerations	2	Availability of forest and/or woodland in district/province Clear link between project activities and existing causes of deforestation and degradation Degree of degradation/deforestation in existing vegetation Availability of water to support irrigation, nursery production of seedlings etc. Potential to generate additional ecological benefits e.g. protection of valuable watershed areas, conservation of biodiversity, reduced rate of soil erosion)
Technical considerations	2	Suitability of project area for proposed technologies to be demonstrated (e.g. suitability of climate for piloting biogas digester, widespread use of woodfuel for cooking, clear link between biomass use and deforestation/degradation) Potential for effective reduction of GHG emissions through project interventions
Building on ongoing initiatives and investments	2	Availability of baseline projects in the district/province Presence of other ongoing projects and initiatives that result in increased capacity, availability of lessons learned etc. at a local scale Low risk of duplication of activities or implementation of parallel projects Existence of examples of related initiatives, particularly SFM, CBNRM, demonstration of SBES and other renewable energy technologies.
Presence of stakeholders to support implementation	1	Civil society Academia and researchers (e.g. university, technical college, farmer field school etc.)
Alignment with donor	1	Matching GEF and FAO frameworks

criteria		Alignment with project sites and activities proposed in the PIF
Importance (1 least important, 2, important, 3 most important)		

APPENDIX 13: LISTED NURSERY GROWERS IN NANGERHAR AND PARWAN PROVINCES

Nengarhar National Growers' Associations (NGAs)			
Name	Office	Phone	Reg. #
Nangarhar NGA	Jalalabad City Agri Dept.	0700617596	1091
Source: http://afghanistanhorticulture.org/anngo/Default.aspx			

Table A13.1. List of registered nurseries in Nangerhar and Parwan provinces.

Nengarhar registered nurseries		
Nursery name (and owner)	Address	Phone
Haji Kochi	Abdian, BEHSUD	0774861077
Sharq (Saidajan)	Abdian, JALALABAD	0700601824
Enamululhaq	ACHIN	
Mohammad Zabour	Ahmadkhel(Wazir), KHUGYANI	0797141267
Azeem Khan	Akhound Kali, CHAPARHAR,	0700955157
Saifu Rahman	Bandeh, RODAT	
Naim	Barikab, BATI KOT	
Arab	Barikaw, BATI KOT	0799635191
Najibullah	Barikaw, BATI KOT	0798038544
Zahidullah	BEHSUD	
Ghulam Mohammad	Belanafar, BEHSUD	0771126071
Jan Agha	Block 7, JALALABAD	
Bashari (Ata-ul-Haq)	Bukhtan, SURKH RUD	
Qari Atal	Chadi, BATI KOT	
Abdul Qader	Chaghari, RODAT	
Sukrullah	Chaparhar	
Qari Atal	Chardehi, BATI KOT	
Akabar Khan	DARAH-I-NOOR	
Naser	DEH BALA	077641192
Farmi-2 (Government/NVDA)	Farmi-2, BATI KOT	0700605413
Redwanullah	Farmi-2, BATI KOT	0700097529
Sefatullah	Gach, KAMA	0772011589
Ghazi Abad Farm (Government/NVDA)	Ghaziabad, BATI KOT	0799569137
Asadullah	Gulayee, RODAT	
Farid Ahmad	Haji, BEHSUD	
Mohammudullah	Hakimabad, KHUGYANI,	0797419752
Ataullah	Hesar Shahi, RODAT	
Allah Mohammad	Hesarak, RODAT	0797679107
Haji khan	Hesarak, RODAT	071767107
Abdul Wahid	Hisar Shahi, RODAT	
Haji Aminullah	Honarmana, Rodat	0797679107
Shir Agha	Islam Por, KUZKUNAR	
Ghulam Haiderkhan bagh (GAA)	Jalalabad	
Qasri Shahe (forestry dept/MAI)	Jalalabad	0700605118
Ghulam Haider Khan (forestry dept/MAI)	Jalalabad	0700605118

Fazel Mohammad	JALALABAD	
Fazel Haq	JALALABAD	
Rais Khan	JALALABAD	
Mohammad Anawar	JALALABAD	
Hasan Khan	JALALABAD	
Abdul Malik	JALALABAD	
Mohammad Ziwar	JALALABAD	
Mohiudin	JALALABAD	
Abdul Hakim	JALALABAD	
Gul Agha	JALALABAD	
Bahader Khan	JALALABAD	
Hamayoun	JALALABAD	
Doctor Shahji	JALALABAD	
Abdul Raouf	JALALABAD	
Shafiullah	JALALABAD	
Kayhan	JALALABAD	
Hamid	Jamali, BEHSUD	
Nangarhar (Ahmad Zaki)	Jamali, JALALABAD	
Ahmad Farid	Jamali, JALALABAD	
Barakatullah	Jovi 11, JALALABAD	
Haji Qadir	Jovi Dah, JALALABAD	
Farm-e-Jaded (MAI)	Kariz kabir, JALALABAD	0700605118
IF HOPE	Kariz Kabir, JALALABAD	070060570
Mir Agha	KHUGYANI	
Mamoor	Lowerti, BATI KOT	0700974080
Padsha	Lowerti, BATI KOT	
Haji Abdul Hanan	Malakano kali, RODAT	
Mama Khil (forestry dept/MAI)	Mama Khel, SHER ZAD	0700605118
Sayed Majdod	Manu, CHAPARHAR	
Haji Mehrajuddin	Mareez, DEH BALA	
Noorullah	Memla, KHUGYANI	0700631809
Memla (forestry dept/MAI)	Memla, KHUGYANI	
Rahim Dad	Mia Banda, RODAT	
Latif	Mufti Qala, RODAT	
Abdul Hasib	MUHMAND DARA	
Ghulam Farog	Nafarak, SURKH RUD	0700635250
Najmudin	Nafarak, SURKH RUD	
Belal	Nagar Khyle, KHUGYANI	
Hamidullah	Nagar Khyle, KHUGYANI	
Sayed Shaji	Nagar Khyle, KHUGYANI	
Noorajan	Nahar Masi, BEHSUD	
Abdul Basir	Nahre Mase, BEHSUD	
Eisa Jan	Nahre Masi, BEHSUD	
Noorajan	Narmasi, JALALABAD	0700909243
Dr.Momand	Nawabad, KAMA	0700606085
Sahar Gul	NAZYAN	
Habib Gul	Pul Kama, KAMA	0799568437

Qudrat	Qailagho, KHUGYANI	0799711290
AREA	Qala-i-Janar, JALALABAD	
Stanikzai	Qala-i-Merza, JALALABAD	
Amir Mohammad	Qasem Abad, BEHSUD	
Abdul Wahid	RODAT	
Ghazi	Roghani, RODAT	
Joma Gul	Samarkhel, JALALABAD	
NVDA	Samarkhel, JALALABAD	0700611504
Fazel Nabi	Sar Shahi, RODAT	
Abdul Latif	Saracha, BEHSUD	
Mohammad Asif	Shagali, JALALABAD	0700613868
Ehsanulhaq	Shah Naser, SURKH RUD	
Ataulhaq	Shah Naser, SURKH RUD	
Afghan Nursery (Haji Zahir Qadir)	Shanasir Agha, SURKH RUD	
MADERA	Shewa, KUZKUNAR	0700617979
Matiullah	Sra Kala, CHAPARHAR	
Abdul Ahad	SURKH RUD	

Source: <http://afghanistanhorticulture.org/anngo/Default.aspx>

Parwan National Growers Associations (NGAs)		
Name	Office	Phone
Bagram NGA	Robat Village, Bagram District	0700029628
SayedKheil NGA	Sayed Khel Bazar, Sayed Khel District	0700270318

Source: <http://afghanistanhorticulture.org/anngo/Default.aspx>

Parwan registered nurseries		
Nursery name (and owner)	Address	Phone
Abdara Nursery (Forestry Department/MAI)	Abdara, SHINWARI	
Shamsudin	Abid Khyle, SAYYID KHEL	
Abdul Manan	Aghornak, JABULUSSARAJ	
Sayed Rahman	Andarabi, JABULUSSARAJ	
Sayed Rahma	Andirabi, SAYYID KHEL	
Shah Wali	Angab Bala, GHORBAND	
Mohammad Nabi	Angab Bala, GHORBAND	
Shir Alam	Angab, GHORBAND	
Shir Mohammad	Ashiq Abad, JABULUSSARAJ	
Abdul Farid	Ashiq Abad, JABULUSSARAJ	
Jamshid	Ashtaraka (Sayedkhel), JABULUSSARAJ	
Mohammad Arif	Ashtor Khel, JABULUSSARAJ	
Mirwais	Aziz Khyle, SAYYID KHEL	
Merwais	Azizkhel (Sayedkhel), JABULUSSARAJ	
Noor Mohammad	Badamak, SURKHI PARSA	
Nabi Mohammad	Bagh ye Afghan, SHINWARI,	
Mir Agha	Bahadur Big, JABULUSSARAJ	
Joma Khan	Balade (Sayed Khel), JABULUSSARAJ	
Bagh Omimi Gulbahar	Bazar Gulbahar, JABULUSSARAJ	

(government)		
Sakhi Dad	Chahar Deh-ye Ghowr Band, GHORBAND	
Haji Mohammad Akbar	Chahar Deh-ye Ghowr Band, GHORBAND	
Noor Mohammad	Chaqarkhel (Sayedkhel), JABULUSSARAJ	
Abdul Ghaus	Charborch, JABULUSSARAJ	
Haji Noor Ahmad	CHARIKAR	
Noor Agha	Chinaki Bala (Sayedkhel), JABULUSSARAJ	
Abdul Ghafor	Chinaki Sufla, JABULUSSARAJ	
Noor Agha	Chinaki Ulya, JABULUSSARAJ	
Shir Afganj	Chob Bakhsh Robat, BAGRAM	
Mohammadullah	Chob Bakhsh Robat, BAGRAM	
Abdul Mahfouz	Chobbakhsh, BAGRAM	0700029628
Saif Rahim	Choghr Khyle, SAYYID KHEL	
Abdul Hamid	Dado, CHARIKAR	
Tarwaj (government)	Dado, CHARIKAR	
Mohammad Karim	Dah Tajikan, SHINWARI	
Ghulam Sakhi	Dahane Darwaz, SHAYKH ALI	
Najibullah	Dahane Darwaz, SHAYKH ALI	
Abdul Qadir	Dahane Darwaz, SHAYKH ALI	
Shekh Ali Mother Stock Nursery (Sayed Habib)	Dahane Rabat, SHAYKH ALI	
Abdul Rahman	Dahane Sar Bala, SHAYKH ALI	
Noor Mohammad	Dandab, GHORBAND	
Abdul Qahar	Dasht Rabta, BAGRAM	0799386117
Mir Alam	Dasht Rabta, BAGRAM	
Moqim	Dashtak, GHORBAND	
Yar Mohammad	Dashtak, GHORBAND	
Shah Wali	Dasht-e-Rabat, BAGRAM	
Haji Rahmudin	Dasht-e-Rabat, BAGRAM	
Barialai	Dasht-e-Rabat, BAGRAM	
Abdul Kabir	Dast Robta, BAGRAM	
Abdul manan	Deh Ghorsang, SAYYID KHEL,	
Rahmatullah	Deh Hazara, BAGRAM	
Abdul Rahim	Deh Hazara, BAGRAM	
Nasratullah	Deh Hazara, BAGRAM	
Abdul Zaher	Deh Hazara, BAGRAM	
Najibullah	Deh Hazara, BAGRAM	
Sardar Agha	Deh Hazara, BAGRAM	
Ewazulhaq	Deh Hazara, BAGRAM	
Allah Dad	Deh Hazara, BAGRAM	
Feda Mohammad	Deh Hazara, BAGRAM	
Ahmadulhaq	Deh-e Harzara, BAGRAM	
Zaker Hussain	Deh-e Harzara, BAGRAM	0799683164
Abdul Malik	Deh-e Harzara, BAGRAM	0778825530
Abdul Majid	Deh-e Harzara, BAGRAM	0799434198
Faqirullah	Deh-e Harzara, BAGRAM	0799374793
Abdul Qadir	Deh-e Harzara, BAGRAM	0798272607

Abdul Munir	Deh-e Harzara, BAGRAM	070891449
Abdul Tahir	Deh-e Harzara, BAGRAM	070053508
Mohammad Sediq	Deh-e Harzara, BAGRAM	0799846238
Abdul Rasoul	Deh-e Harzara, BAGRAM	070191454
Mirbacha	Deh-e Harzara, BAGRAM	
Aghai Khord	Dehe Mula Yousuf, JABULUSSARAJ	
Naqibullah	Dehe Qazi, JABULUSSARAJ	
Hamayoun	Dehe Qazi, JABULUSSARAJ	
Abdullah	Dekqat, SURKHI PARSA	
Amanullah	Dektor, SURKHI PARSA	
Mohammad Akbar	Dektor, SURKHI PARSA	
Shah Rasoul	Derazgerd, SHINWARI	
Abdul Ahad	Derazgerd, SHINWARI	
Abdul Hadi	Deyar, SURKHI PARSA	
Khan Agha	Dubandi, JABULUSSARAJ	
Gul Agha	Dubandi, JABULUSSARAJ	
Abdul Aziz	Eshqabad, JABULUSSARAJ	
Besmillah	Faragerd, GHORBAND	
Mohammad Karim	Faragerd, GHORBAND	
Malik Zamir	Faragerd, GHORBAND	
Besmillah	Faragerd, GHORBAND	
Mohammad Karim	Faragerd, GHORBAND	
Afzal	Faragerd, GHORBAND	
Fraj Nursery (Forestry Department/MAI)	Fraj, SHINWARI	
Agha Mohammad	Galyan, GHORBAND	
Mohammad Jalal	Gamandy, GHORBAND	
Haji Mohammad Jan	Gardana, GHORBAND	
RoP Nursery	Ghulam Ali, BAGRAM	
Zabiullah	Gozara Payin, JABULUSSARAJ	
Habibullah	Gul Mohmmad Khel, GHORBAND	
Atiqullah	Hamza Khyle, SAYYID KHEL,	
Abdul Malik	Hoshtorkar, SAYYID KHEL,	
Shahabudin	Jalnawroz (Sayedkhel), JABULUSSARAJ	
Mohammad Nabi	Joidukhter ye Bala, GHORBAND	
Moghal	Kaka Khyle, SAYYID KHEL	
Sayed Jamal	Kanaqa, BAGRAM	
Sakhi Dad	Kerkar, SURKHI PARSA	
Esmatullah	Khadad Khyle, SAYYID KHEL,	
Abdul Shakor	Khajaka, SAYYID KHEL	
Rahmatullah	Khake Ghulam Ali, SHAYKH ALI	
Mohammad Ewaz	Khake Ghulam Ali, SHAYKH ALI	
Shuja Khan	Khake Ghulam Ali, SHAYKH ALI	
Abdul Mutaleb	Khake Ghulam Ali, SHAYKH ALI	
Abdul Rahman	Khake Ghulam Ali, SHAYKH ALI	
Mulawi Firoz	Khake Ghulam Ali, SHAYKH ALI	
Mohammad Sapa	Khake Ghulam Ali, SHAYKH ALI	

Sarajulhaq	Khake Ghulam Ali, SHAYKH ALI	
Masoom	Khake Ghulam Ali, SHAYKH ALI	
Mohammad Wazir	Khake Ghulam Ali, SHAYKH ALI	
Abdullah	Khake Ghulam Ali, SHAYKH ALI	
Mohammad Omar	Khake Ghulam Ali, SHAYKH ALI	
Ghulam Rasoul	Khake Ghulam Ali, SHAYKH ALI	
Qurban	Khake Ghulam Ali, SHAYKH ALI	
Sardar	Khake Ghulam Ali, SHAYKH ALI	
Mowlawi Ahmad Wali	Khake Ghulam Ali, SHAYKH ALI	
Safar Ahmad	Khanjan Khyle, SAYYID KHEL	
Aminullah	Khawajagi (SayedKhel), JABULUSSARAJ	
Abdul Shokor	Khojgi, JABULUSSARAJ	
Khani	Khojgi, JABULUSSARAJ	
Qari Aziz	Khowaja Mohamamd, JABULUSSARAJ	
Abdul Manan	Khowaja Mohammad Khyel, JABULUSSARAJ	0700495884
Mohammad Asif	khowajakhel, JABULUSSARAJ	
Barialai	Khudaidad Khel, JABULUSSARAJ	
Agha Shirin	Khawajakhel, JABULUSSARAJ	
Agha Kalan	Khawajakhel, JABULUSSARAJ	
Abdul Raqib	Khawaja-Sayaran Sufla, CHARIKAR	
Said Jalil	Khawaji Sayrine, CHARIKAR	
Jabar Khan	Kodwali, BAGRAM	
Sayed Pain	Kolanch, SURKHI PARSA	
Mohammad Mehdi	Korakdana, BAGRAM	
Majidi	Laghmani (Kakara), CHARIKAR	0799423528
Haji Rajab	Laghmani (Qala Kohna), CHARIKAR	
Ismail	Langar, GHORBAND	
Abdul Karim	Latif Khel, JABULUSSARAJ	070025914
Ghulam Farooq	Loghmankhyle, SAYYID KHEL	
Ali Murad	Lolakh, SURKHI PARSA	
Abdul Hadi	Lolakh, SURKHI PARSA	
Abdul Ahad	Mahazudin Khil, JABULUSSARAJ	
Nasir Ahmad	Mahigir, BAGRAM	070195571
Mula Gulistan	MakarKhel, GHORBAND	
Mula Gulistan	Makarkhel, GHORBAND	
Abdul Ghafar	Malak Shah Khel (Sayed Khel), JABULUSSARAJ	
Abdul Zaher	Malisha Khyle, SAYYID KHEL	
Abdul Ghafour	Manara, JABULUSSARAJ	
Sayed naqibullah	Manara, JABULUSSARAJ	
Mohammadullah	Mashtani, SHINWARI	
Dastagir	Meherdelkhil, JABULUSSARAJ	
Sayed Baqer	Meta, SURKHI PARSA	
Abdul Nasir	Meta, SURKHI PARSA	
Abdul Wasi	Mina Joi, JABULUSSARAJ	
Dadullah	Mina Joi, JABULUSSARAJ	

Ghulam Distagir	Mirdailkhyle, SAYYID KHEL	
Abdul Zahir	Mirkhel (Sayedkhel), JABULUSSARAJ	
Sayed Zahir	Mirkhel, JABULUSSARAJ	070182236
Habib Gul	Mirza Gul Khyle, SAYYID KHEL	
Hasamodin	Mohammad Khankhel, JABULUSSARAJ	
Khowaja Mahmood	Mohammad Khankhel, JABULUSSARAJ	
Abdul Basir	Mohammad Khankhel, JABULUSSARAJ	
Ihsamudeen	Mohammad Khankhel, JABULUSSARAJ	0797281063
Atiqullah	Mohammad Khankhel, JABULUSSARAJ	
Jamhoor	Mohammad Khyle, SAYYID KHEL	
Abdul Sabour	Naser Khan Khyle, SAYYID KHEL	
Halim	Naser Khan Khyle, SAYYID KHEL,	
Sayed Karim	Naseri, BAGRAM	070175894
Salem Khan	Naseri, BAGRAM	0799833488
Kheyali Gul	Naseri, BAGRAM	070088789
Mohammad Hassan	Naseri, BAGRAM	0799080709
Nangialay	Naseri, BAGRAM	0799601126
Mohammad Usman	Naseri, BAGRAM	
Noor Gul	Naseri, BAGRAM	079908789
Sadullah	Naseri, BAGRAM	079908789
Ghulam Sayed	Naseri, BAGRAM	
Mohammad Wali	Naseri, BAGRAM	0799841905
Sayed Agha	Naseri, BAGRAM	
Fazel Ahmad	Naserullahkhel, JABULUSSARAJ	
Sayed Hakim	Niazakhel (Sayedkhel), JABULUSSARAJ	0773452435
Sayed Mahboob	Parakh, CHARIKAR	
Besmillah	Paye Ruki, SURKHI PARSA	
Mohammad Tahir	Paye Ruki, SURKHI PARSA	
Mail Agha	Per-i-Hazer, BAGRAM	
Zoor Ali	Peshangi, SURKHI PARSA	
Ghulam Mohammad	Peshangi, SURKHI PARSA	
Qasim Khan	Pule Sadullah (Sayedkhel), JABULUSSARAJ	
Parwiz	Qalacha, JABULUSSARAJ	
Astad Shams alhaq	Qalai Balona, BAGRAM	
Haji Abdul Razaq	Qalai Balona, BAGRAM	
Qasem Khan	Qalai Balona, BAGRAM	
Mohammad Ali	Qalai Balona, BAGRAM	
Nabi Khan	Qalai Balona, BAGRAM	
Baba Mula	Qalai Balona, BAGRAM	
Mohammad Anwar	Qala-i-Malek, BAGRAM	0798212071
Abdul Ghani	Qala-i-Naw, GHORBAND	
Khan Mula	Qala-i-Zaman, CHARIKAR	
Zaber Ahmad	Qalandarkhel, BAGRAM	
Nazir Ahmad	Qalanderkhel, BAGRAM	
Hamid	Qalanderkhel, BAGRAM	070826078
Ghulam Sakhi	Qam Chaq, GHORBAND	

Shirjan	Qapzar, SURKHI PARSA	
Gul Dastagir	Qaqchal, SHINWARI	
Shamsudin	Qaqchal, SHINWARI	
Mohammad Akogul	Qaqchal, SHINWARI	
Zabiullah	Qara Baghi Robat, BAGRAM	
Mir Alam	Qara Baghi Robat, BAGRAM	
Abdul Jamil	Qara Baghi Robat, BAGRAM	
Haji Abdul Qaher	Qara Baghi Robat, BAGRAM	
Mohammad Amin	Qara Baghi Robat, BAGRAM	
Mohammad Din	Qara Baghi Robat, BAGRAM	
Haji Lala Mir	Qara Baghi Robat, BAGRAM	
Shamsul Rahman	Qara Baghi Robat, BAGRAM	
Amanullah	Qara Baghi Robat, BAGRAM	
Ajab Gul	Qara Baghi Robat, BAGRAM	
Hayatullah	Qara Baghi Robat, BAGRAM	
Hamidullah	Qara Baghi Robat, BAGRAM	
Haji Shir Agha	Qara Baghi Robat, BAGRAM,	
Abdul Kabir	Qara Baghi Robat, BAGRAM,	
Haji Shir Agha	Qarabaghi, BAGRAM	
Dil Agha	Qarabaghi, BAGRAM	070240680
Mohammad Hashim	Qasimkhel (Sayedkhel), JABULUSSARAJ	
Joma Khan	Qatander, SURKHI PARSA	
Mula Abdul Rahim	Qodos Khyle, SAYYID KHEL	
Mohammad Nabi	Ranga-i-Bala, GHORBAND	
Mohammad Nawroz	Rashna, SURKHI PARSA	
Abdul Raziq	Rasoul Dadkhel (Sayedkhel), JABULUSSARAJ	
Abdul Wadoud	Rodrabta, BAGRAM	0772027928
Abdul Basir	Rukha, CHARIKAR	
Noor Agha Akbari	Rukha, CHARIKAR	
Mohammad Ashraf	Sadullah, CHARIKAR	
Ghulam Jan	Sadullah, CHARIKAR	
Aminullah	Sadullah, CHARIKAR	
Mohammad Sharif	Saidoullah, CHARIKAR,	
Khan Kaka	Salih Khan Khyle, SAYYID KHEL	
Mula Ghias	Saqa, GHORBAND	
Mohammad Younus	Sarehous Chatagi, JABULUSSARAJ	
Sulaiman	Sarihowzchinki (sayedkhel), JABULUSSARAJ	
Mohammad Younus	Saryhouse, SAYYID KHEL	
Abdul Ahmad	Saryhouse, SAYYID KHEL,	
Ashraf	Saryhouse, SAYYID KHEL,	
Sayed Wazir	Shahka, BAGRAM	
Qand Agha	Shahka, BAGRAM	
Abdul Zahir	Shahmir Khyle, SAYYID KHEL	
Mohammad Hashim	Shakhali, JABULUSSARAJ	
Saifurahman	Shakoorkhel (Sayedkhel), JABULUSSARAJ	

Haji Mohmmad Alam	SHINWARI	
Haji Mohmmad Halim	SHINWARI	
Haji Nawroz	SHINWARI	
Marjan	SHINWARI	
Mia Jan	SHINWARI	
Alam Jan	SHINWARI	
Mula Jan	SHINWARI	
Mohammadajan	SHINWARI	
Nahalistan Alfajer (Sayed Hamidullah)	SHINWARI	
Zekrullah	SHINWARI	
Shamsudin	SHINWARI	
Abdul Qudos	Siahgerd, GHORBAND	
Allah Bakhsh	Siahgerd, GHORBAND	
Ainullah	Siahgerd, GHORBAND	
Hji Nawroz	Surkh Sang, SHINWARI	
Mohammad Zahir	Surkh Sang, SHINWARI	
Ghulam Haidar	SURKHI PARSA	
Sayed Paiwand	SURKHI PARSA	
Barialai	Totumdara-i-Sufla, CHARIKAR	
Sayed Ali Jan	Turkman, SURKHI PARSA	
Cheragh Ali	Turkman, SURKHI PARSA	
Khodadad	Turkman, SURKHI PARSA	
Abdul Wali	Yakakhenjak, SHINWARI	
Gul Padsha	Yakhel, BAGRAM	
Noor Rahman	Yakhel, BAGRAM	
Mail Agha	Yakhel, BAGRAM	
Mohammadullah	Zere Khawal, SHAYKH ALI	
Abdullah	Zere Khawal, SHAYKH ALI	

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APPENDIX 14: LETTERS OF CO-FINANCING