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Программа Организации Объединенных Наций по окружающей среде

برنامج الأمم المتحدة للبيئة

联合国环境规划署



PROJECT DOCUMENT

Section 1: Project Identification

- 1.1 Project title:** GLOBAL FOREST WATCH (GFW)
- 1.2 Project number:** GEF Project ID: 5356
GEF Agency Project ID: 1087
- 1.3 Project type:** Full size project (FSP)
- 1.4 GEF Agency:** UNEP
- 1.5 Other Executing Partners:** World Resources Institute, Ministry of Environment and Natural Resource Protection (MoENRP) of Georgia, Ministry of Environment, Ecology and Forests (MEEF) of Madagascar
- 1.6 Strategic objectives:** GEF Focal Area: Multi-focal area (BD, CC, And LD)
- 1.7 UNEP priorities:** **Ecosystem management, Climate Change, Environment under Review**
EM (a) Use of the ecosystem approach in countries to maintain ecosystem services and sustainable productivity of terrestrial and aquatic systems is increased
CC(c) Transformative REDD+ strategies and finance approaches are developed and implemented by developing countries that aim at reducing emissions from deforestation and forest degradation and bringing multiple benefits for biodiversity and livelihoods
ER (a) Global, regional and national policy-making is facilitated by environmental information made available on open platforms
ER(c) The capacity of countries to generate, access, analyze, use and communicate environmental information and knowledge is enhanced
- 1.8 Geographical scope:** Global – Madagascar, Georgia
- 1.9 Mode of execution:** External
- 1.10 Project executing Organization:** World Resources Institute (WRI)
- 1.11 Duration of project:** 36 months
Commencing: September 2015
Completion: September 2018

1.12 Cost of project

	USD \$	%
GEF Trust Fund	\$5,342,465	16.1%
Co-financing Cash		
WRI	\$6,000,000	18.1%
Sub-total	\$6,000,000	18.1%
Co-financing In-kind		
Government (Georgia)	\$2,000,000	6.0%
Government (Madagascar)	\$2,500,000	7.5%
GIZ (Georgia)	\$500,000	1.5%
UNEP	\$300,000	0.9%
ESRI	\$9,494,000	28.6%
Transparent World	\$7,100,000	21.4%
Sub-total	\$21,894,000	65.9%
TOTAL	\$33,236,465	100.0%

Project Summary

Maintaining and expanding global forest cover are critical aspects in supporting human livelihoods and planetary stability, since forests represent key components of local livelihoods and economies, carbon storage, water management and storehouses of biodiversity. Despite these extraordinary, and in many cases, irreplaceable values, high levels of deforestation and forest degradation continue.

In response to these persisting challenges, WRI decided in 2011 to relaunch Global Forest Watch (GFW), a system for monitoring forest cover change that had first been developed in 1997. A prototype of the new GFW¹ was presented at Rio+20 in 2012. Key partner organizations and financial donors joined in a Partnership, the first meeting of which was held in September 2013. In February 2014, following an active period of site development, the GFW beta website was officially launched.²

Through GFW, WRI and its partners seek to ignite a forest management transparency revolution by dramatically improving the availability and accessibility of forest information worldwide. GFW applies cutting-edge science and technology to generate the timeliest, most precise, and most reliable information available about what is happening in the world's forests. The GFW platform is offering billions of people unrestricted access to this information in decision-relevant and actionable formats.

The overall goal of the GFW effort—to which the GEF project will contribute—is to reduce deforestation and improve rural livelihoods by transforming forest management and conservation at a global scale. The project objective is to empower decision-makers in government, the private sector, and civil society with technology and information necessary to reduce deforestation and land degradation, combat illegal activities, and conserve biodiversity in pilot countries and on a global scale.

The project will aim to address key barriers to better information availability and use, building upon existing resources, and developing innovative and technically advanced and user-friendly tools. In addition, it will engage proactively with strategic user groups including government agencies, business and local NGOs to ensure that the information is used effectively and lessons learned are shared globally to accelerate progress elsewhere.

The project operates at two distinct, but inter-connected geographic levels, namely global and national. Global-level activities are distributed across each of the project's four components, while national-level, or pilot country, support to Georgia and Madagascar is concentrated within Component 1. Each pilot country offers important global benefit and demonstration opportunities. The Madagascar pilot will support conservation of that country's critical and highly endemic biodiversity, while work in Georgia will help to demonstrate GFW's potential contribution to sustainable use and conservation of Mediterranean forests, with significant replication opportunities.

At the pilot country level, GEF support will enable “deep dive” partnerships to achieve sustained impact, including through long-term partnerships with government agencies, civil society and the private sector. Forest stakeholders, including governmental officers, civil society, donors and buyers of commodities, in the pilot countries will acquire capacity and gain easy access to near-real-time and reliable data to support their forest conservation, sustainable forest management, REDD+ efforts and risk management.

The project includes the following components:

- Component 1: Application and enhancement of GFW globally and in pilot countries
- Component 2: System uptake and replication
- Component 3: Strengthening and sustaining the GFW partnership
- Component 4: Private sector application to reduce deforestation in key commodity sector supply chains

¹ Initially known as ‘GFW 2.0’, now simply ‘GFW’.

² Additional details regarding the GFW platform are presented in Section 2.6 below.

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Acronyms and Abbreviations

AGEDI	Abu Dhabi Global Environmental Data Initiative
AIT-UNEP	Regional Resource Center for Asia and the Pacific
CBD	Convention of Biological Diversity
CGD	Center for Global Development
CGF	The Consumer Goods Forum
CI	Conservation International
COBAs	Communautés de Bases
CSO	Civil society organisations
DCC	Department du changement climatique (Climate change department) (Madagascar)
EIA	Environmental impact analysis
EU	European Union
FLEGT	Forest Law Enforcement, Governance and Trade
GEAS	Global Environment Alert Service
GEF	Global Environmental Fund
GEMS	The United Nations Global Environment Monitoring System
GEOSS	Global Earth Observation System of Systems
GFW	Global Forest Watch
GHG	Greenhouse gases
GIS	Geographic Information Systems
GIZ	Gesellschaft für Internationale Zusammenarbeit, Germany
IAEG	Inter-agency and Expert Group
IBA	Important bird area
IOGA	Institut et Observatoire de Géophysique d'Antananarivo
IPBES	Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for the Conservation of Nature
IWG	Intersecretariat Working Group on Forest Sector Statistics
LULUCF	Land Use, Land-Use Change and Forestry
MEEF	Ministry of Environment, Ecology and Forests of Madagascar
MENR	Ministry of Environment and Natural Resources
MENRP	Ministry of Environment and Natural Resource Protection of Georgia
MODIS	Moderate Resolution Imaging Spectroradiometer
MRV	Measurement, reporting and verification
NASA	National Aeronautics and Space Administration
NEAP	National Environmental Action Plan
NGO	Non-governmental organization
OSFAC	Observatoire Satellital des Forêts d'Afrique Central
PA	Protected Area
PES	Payment for Ecosystem Services
PFN	Le renforcement des Programmes Forestiers Nationaux
REDD+	Reducing emissions from deforestation and forest degradation
ROA	UNEP's regional offices for Africa
ROE	UNEP's regional offices for Europe
SFM	Sustainable forest management
SLM	Sustainable land management
TFA	Tropical Forest Alliance
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environmental Programme
UNEP-DEPI	UNEP Division of Environmental Policy Implementation
UNEP-DEWA	UNEP Division of Early Warning and Assessment
UNEP-WCMC	UNEP World Conservation Monitoring Centre
UNFCCC	United Nations Framework Convention on Climate Change
UNGIWG	United Nations Geographic Information Working Group
USAID	United States Agency for International Development
VPA	Voluntary Partnership Agreements
WAVES	The Wealth Accounting and the Valuation of Ecosystem Services
WDPA	World Database on Protected Areas
WRI	World Resources Institute
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund

Section 2: Background and Situation Analysis (Baseline Course of Action)

2.1 Background and context

Maintaining and expanding global forest cover are critical aspects in supporting human livelihoods and planetary stability, since forests represent key components of local livelihoods and economies, carbon storage, water management and storehouses of biodiversity. Despite these extraordinary, and in many cases, irreplaceable values, high levels of deforestation and forest degradation continue.

Historically, deforestation often went unchallenged because it was out of sight and therefore out of mind. To help tackle this issue, the World Resources Institute (WRI) launched the original Global Forest Watch (GFW) in 1997. GFW leveraged GIS technology to create maps of the great forest basins of the world: the Amazon, the Congo, Southeast Asia, Canada, and Russia. Equipped with this information, policymakers and nongovernmental organizations (NGOs) were able to develop better forest policies, establish protected areas, enforce laws and improve forest management. However, these maps were updated infrequently and were of relatively low spatial resolution, limiting their usefulness for real-time actions to address undesirable deforestation as it emerges.

Deforestation continues in part because, by the time satellite images are available, analyzed, and shared, the forest clearing is long done. It is much harder to hold those responsible for forest loss and degradation accountable, or reward those who are managing forests well, when high-quality data is unavailable, expensive or too difficult for non-experts to use.

In response to these persisting challenges, WRI decided in 2011 to relaunch GFW. A prototype of the new GFW³ was presented at Rio+20 in 2012. Key partner organizations and financial donors joined in a Partnership, the first meeting of which was held in September 2013. In February 2014, following an active period of site development, the GFW beta website was officially launched.⁴

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Even assuming perfect information, however, it is also necessary to ensure that information is acted upon. GFW therefore also seeks to transform information into action by helping governments and businesses improve land use and forest management practices on the ground, and by empowering civil society, journalists, and communities to hold decision-makers accountable.

2.2 Global significance

Forests are a vital natural resource, covering approximately 31% of global land surface⁵ and storing at least 289 gigatonnes of carbon.⁶ In addition, forests host 80% of the world's land-based biodiversity.⁷ Yet, 13 million hectares of forests are lost every year, largely due to the conversion of forests to other land uses, such as agricultural expansion, as well as forest clearing due to infrastructural development and natural resource extraction.⁸ Moreover, between 2000 and 2010, more than 40 million hectares of

³ Initially known as 'GFW 2.0', now simply 'GFW'.

⁴ Additional details regarding the GFW platform are presented in Section 2.6 below.

⁵ Food and Agriculture Organization of the United Nations. *State of the World's Forest 2012*. [FAO State of the World's Forest] Rome, 2012. <http://www.fao.org/docrep/016/i3010e/i3010e.pdf>

⁶ Food and Agriculture Organization of the United Nations. *Global Forest Resources Assessment 2010: Main Report*. [FAO Global FRA] Rome, 2010. <http://www.fao.org/docrep/013/i1757e/i1757e.pdf>

⁷ United Nations Climate Summit 2014. *New York Declaration on Forests and Action Agenda*. New York, 2014.

<http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/09/FORESTS-New-York-Declaration-on-Forests.pdf>

⁸ See United Nations Climate Summit 2014.

primary forests were lost due to human activities; primary forests now account for only 36% of all forest area.⁹ Due to the broad scope of these activities, deforestation and forest degradation account for almost 20% of the world's greenhouse gas emissions—the second-ranked cause of greenhouse gas emissions.¹⁰

Forests in Georgia and Madagascar—pilot countries participating in the present project—are globally significant in distinct ways that are outlined below.

Georgia: WWF identifies the Caucasus as an eco-region of global importance characterized by high species diversity, a high degree of endemism, diversity of vegetation types and rare biomes at global level. Georgia in particular is a biologically rich country (especially considering its relatively small area). It hosts approximately 4,130 species of vascular plants, including some 600 species (14.2% of the total number of species) which are Caucasian endemic and about 300 species (9.0% of the total number of species) which are Georgian endemics. 16,054 faunal species have been described in Georgia, of which 758 are vertebrates.

Forests are the most important biome for biodiversity conservation in Georgia, harboring many endemic and relic species of woody plants and herbs, and providing habitats for globally rare and endangered animals. Forests cover about 2.7 million ha in Georgia, or about 40% of the country. They include an estimated 0.5 million ha of primary forests, 2.2 million ha of natural modified forests and 60,000 ha of protective artificial plantations.

As of 2010, 50 protected areas were established in Georgia (14 strict nature reserves, 8 national parks, 14 natural monuments, 12 managed natural reserves and 2 protected landscapes) covering 7.1% (493,988 ha) of the area of the country. In addition, 17 sites of special importance for biodiversity conservation are included into the Emerald Network, and 31 important bird areas (IBAs) have been identified. Two wetlands in the Kolkheti lowland are included on the Ramsar Convention list of Wetlands of International Importance.

While Georgia's annual rate of deforestation is relatively low, at -0.09%, there are notable signs of forest degradation. Improved forest management would enable Georgia to become a significant net source of reforestation and restoration, enhance critical habitat areas, reduce fragmentation and land degradation, sequester additional greenhouse gases and, not least, take better and more sustainable advantage of a wide range of forest products and services.

Madagascar: Madagascar is the fourth largest island in the world, and is one of 17 mega-diverse countries that together represent 80% of the world's biological diversity (CI 2000). It shelters four of the WWF's Global 200 terrestrial ecoregions—forests and shrublands, dry deciduous forest, spiny thicket and mangroves—and one freshwater ecoregion.

As of 2010, Madagascar had an estimated forest cover of 9,220,040 ha, or approximately 16% of the country's land area.¹¹ As a result of its long geographical isolation and its highly varied geomorphology and micro-climates, Madagascar has a high variety of terrestrial ecosystems. The known species count includes 210 species of mammals (98% of which are endemic), 310 species of avifauna (60% endemic), 630 species of herpetofauna (98% endemic), 164 species of freshwater fishes (60% endemic), and 13,700 species of higher plants (>90% endemic). Some key examples include: lemurs, all but one species of which occur naturally only in Madagascar; baobabs trees, 8 species of baobab are found in the world, six of which are endemic to Madagascar. Overall, the island supports one of the most diverse floras on the planet; by comparison, tropical Africa has 30,000-35,000 species and covers almost 35 times as much area as Madagascar. Madagascar is also home to a large diversity of medicinal plants that are of critical importance to the pharmaceutical industry, e.g. Madagascar periwinkle (*Catharanthus roseus*).

⁹ See FAO Global FRA.

¹⁰ UN-REDD Programme. *About REDD+*. 2009. <http://www.un-redd.org/AboutREDD/tabid/102614/Default.aspx>

¹¹ : MEEF, ONE, CI, FTM, MNP. 2013. Evolution de la couverture des forêts naturelles à Madagascar. 2005-2010

Inventory and research on biodiversity of Madagascar is still far from complete and many more species remain to be discovered. From 1999 to 2010, scientists discovered 615 new species in Madagascar, including 41 mammals and 61 reptiles. Most remarkable is that Madagascar harbors endemism at higher taxonomic levels, including five endemic botanic families and five endemic primate families. By comparison, Brazil, the largest tropical country of the world, does not have a single endemic family.

Madagascar hosts a national network of protected areas, which covers 47 sites and an area of 1,781,465 hectares, or (a rather low) 3 per cent of the territory. These protected areas are managed under the National Environmental Action Plan (NEAP). The terrestrial protected areas of Madagascar cover over 5.5 million hectares, i.e. approximately 9.4% of the country's surface. They are managed by both governmental or non-governmental, non-profit organizations. The PA system does not represent the country's biogeography fully and some forest habitats are critically under-represented e.g., high montane forest, mangroves, western deciduous forests, sub montane forests and riparian forests.

2.3 Threats, root causes and barrier analysis

Forest loss and land degradation continues across tropical and other forest regions, resulting in biodiversity loss, greenhouse gas emissions, soil erosion and changes in the micro climate and weather patterns, increasing the risk of desertification and food insecurity. Almost two billion hectares of natural forest have been cleared to meet human needs. A similar amount of forest has been degraded through fire, introduced pests, logging and other actions.¹²

According to the latest Forest Resource Assessment¹³, gross annual forest loss globally is 13 million hectares. Meanwhile, a recent UNEP/Interpol report¹⁴ estimates the economic value of global illegal logging, including processing, at USD 30-100 billion (10-30% of the global wood trade). A review of 152 studies of the proximate and underlying causes of tropical deforestation concluded that multiple factors best explain forest loss, with agricultural expansion associated with nearly all deforestation (96 percent of the cases), including for cropland and cattle ranching.¹⁵ Drivers of forest loss include expansion of subsistence and large scale farming, illegal timber and fuelwood/charcoal extraction, and animal husbandry. Policies supporting establishment of plantation industries, large-scale ranching, and agricultural expansion favoring large land holdings were identified as prominent underlying causes to deforestation, land and forest degradation. Road construction (access) was also found to be a major factor often unmitigated by policies and procedures for rational land use and infrastructure planning. Land tenure, and to some extent the legislation regulating property rights (especially in Asia) are also important in a majority of the cases. The continued loss of forests and degradation of forest landscapes are thus symptoms of deeper deficiencies in markets and governance.¹⁶

Globally, several critical barriers related to the availability, timeliness and accuracy of forest data and information tend to hamper forest management. These barriers include:

- *Unavailable information:* Many governments simply do not possess accurate information about forest cover change and forest ownership.

¹² See <http://www.wri.org/map/global-map-forest-landscape-restoration-opportunities>

Hanson, M.C., Potapov, P.V., and Stehman, S.V. 2010, Quantification of global forest cover loss, Proceedings of the National Academy of Sciences, 107 (19), 8650-8655.

¹³ (FAO 2010)

¹⁴ (Nelleman, C., 2012)

¹⁵ Geist H.J. & E.F. Lambin, 2002, Proximate causes and underlying driving force of tropical deforestation, Bioscience, 52 (2), 143-150.

¹⁶ See for example, Governance, Development and Aid Effectiveness: A Quick Guide to Complex Relationships. ODI Briefing Paper, March 2006, <http://www.odi.org.uk/resources/docs/218.pdf> and A.Contreras-Hermosilla, 2000, CIFOR, Occasional Paper Number 30, <http://www.cifor.org/nc/online-library/browse/view-publication/publication/626.html>

- *Delays in data / analysis becoming available:* Even when information does exist, it may only become available several years after the fact, long after action could have been taken to address issues detected.
- *Inaccuracy:* Information is often inaccurate, or its accuracy cannot be verified because the methods used are not available for scientific peer review.
- *Inconsistency:* Due to inconsistent data monitoring and analytical methods, information is often not inter-comparable, or consistent, either within or between countries. This makes it difficult to look for wider trends and relationships, or to compare progress and problems between countries and regions or from one time period to another.
- *Lack of transparency:* Information regarding commercial forests may be closely held, in some cases to deflect attention from special deals and inappropriate uses and conditions of use.
- *High costs:* Developing data and information generation and management capabilities, whether in national or sub-national government agencies or NGOs, is expensive. For example, Indonesia, in partnership with the Australian Government, is spending millions of dollars over several years to build an improved national monitoring system. Greenpeace spends about US\$ 2 million per year on in-house forest monitoring and associated analysis. Remote sensing data in particular remains expensive, and conducting independent analysis of changes in forest cover can be extremely costly and technically complex.
- *Top down, not interactive:* Monitoring and information systems are often very top down, not drawing on the wealth of existing knowledge and insight across landscapes and regions embodied in local citizens, NGOs and government agencies. Opportunities to tap such knowledge resources through social networking and other techniques remain poorly developed.
- *Technical complexity:* While satellite imagery is readily available, its analysis and interpretation continues to be extremely challenging from a technical point of view, thus limiting its availability in practice. Data is often published in a very technical format, unusable to any but a small elite group of specialists.
- *Dispersed data:* Other information, such as on logging licenses, agricultural investment, infrastructure and demographics, which needs to be analyzed together with changes in forest cover, is typically divided amongst several separate institutions and stored in different formats preventing integrated, national or international-level analyses aimed, e.g. at understanding the drivers of deforestation.

In practical terms, due to various combinations of the above factors, timely and accurate information is often quite simply not available to those who need it. Just as information can lead to action, absence of information contributes to mis- or sub-optimal management. Lack of information can have profound effects across multiple areas of management, including:

- Management of production forests, including leased areas,
- Management of community forests,
- Forest fire prevention and response,
- Protected area management,
- Extractive industries, such as mining,
- Forest monitoring and change detection, including reforestation and rehabilitation,
- Forest carbon management and accounting, including REDD+,
- Environmental impact analysis (EIA),
- Watershed management,
- Integrated land use management and planning.

The project's pilot countries offer illustrative examples of the above problems and associated management challenges, with significant and direct impacts on global biodiversity, carbon and land use values under the present baseline situation.¹⁷

Georgia. Even though Georgia is rich in forest resources, average density of a significant part of its forests is at a critical level. Further degradation could cause a sharp decline in protection functions and self-restoration ability, which in the medium to long term could lead to irreversible degradation of forest ecosystems.¹⁸ Major natural hazards (floods, flash floods, landslides, mudflows, snow avalanches etc.)—some of which may be exacerbated by land degradation and deforestation—impact the national economy of Georgia, with resulting damage to land, buildings, roads, other infrastructure, human health and the environment.

The above factors are causing, or otherwise enabling, habitat destruction, deforestation, fragmentation and extensive, unregulated exploitation of fauna and flora. As a result, many plant and animal species have become endangered in Georgia. Thus, 29 mammal, 35 bird, 11 reptile, 2 amphibian, 14 fish and 56 woody plant species are currently included on the national Red List. In addition, 44 vertebrates found in Georgia are globally endangered and included on the IUCN Red List as vulnerable, endangered or extremely endangered species.

Core drivers of forest degradation are unsustainable, and poorly regulated or controlled, use of timber and other forest resources for both commercial and subsistence use. Underlying causes and associated barriers include: gaps in strategies, programs and policy documents not reflecting sufficiently value of biodiversity; inadequate regulations on use of biological resources; and insufficient resources for implementing regulations and procedures related to biodiversity protection.¹⁹

Substantial data and information gaps constitute important barriers standing in the way of better management of Georgia's forests. Updated data does not exist for the most Georgian forests: since the last inventory, which in any case took place several decades ago, inventory and assessment of forest has been fragmented and covered mostly leased areas. Collecting baseline information on forests, which is necessary for planning and decision-making on forest use, and which would be a starting point for continuous monitoring of forest change dynamics, requires significant resources. Lack of resources, including financial, administrative and human resources, is one of the biggest constraints to improvement of forest information systems.

In addition to the shortage of qualified staff, there is need for expertise and methodologies to apply to remote sensing data, such as aerial and satellite information, as a tool to support field work. Knowledge and skills in interpretation and analysis of remote sensing data are necessary not only for the staff of responsible agencies, but also for civil society organizations undertaking independent forest monitoring or other forest-related activities.

In addition, there is currently no system or platform for consolidating forest-related data and information generated within the responsible agencies or as a result of activities implemented and funded by international donors, NGOs or other organizations. There is also no system for facilitating data sharing between state agencies or for enabling easy public access to forest-related information.

Finally, while the existing GFW site is already useful for many purposes in Georgia, barriers related to language, lack of national ownership, lack of integration of national data layers and insufficiently high resolution, make the existing site less valuable than it could be. In order to ensure sustainability of the efforts to improve data and information, and ensure that these data are regularly updated and used in

¹⁷ The following, together with subsequent sub-sections of section 2, presents relevant information on each of the pilot countries, Georgia and Madagascar. Integrated, and more complete, situation analyses for each country were prepared during the PPG and are presented in national reports (see **Annexes 17 and 18**).

¹⁸ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012.

¹⁹ National Biodiversity Strategy and Action Plan of Georgia 2014-2020, approved by Government Resolution N343 of 8 May 2014.

planning and decision-making, there is need to create a national data portal, which would be managed and regularly updated by a responsible agency.

Table 1 below summarizes the baseline situation and information-related barriers to more effective forest and related land use management in Georgia.

Table 1: Baseline situation and barriers related to forest information, by management areas affected in Georgia

Thematic area	Baseline situation	Key data and information-related barriers to more effective management
Management of production forests	<ul style="list-style-type: none"> • Lack of monitoring and enforcement capacity • Forests not categorized according to functional purpose and value • Civil society lacks easy access to information on issued licenses and related materials 	<ul style="list-style-type: none"> • Limited baseline information on forest conditions • No formal guidelines for functional categorization of forest • No platform that would ensure easy access to information on issued licenses and related materials
Forest fire alert system	<ul style="list-style-type: none"> • Risk of large-scale fires during dry seasons • Poor predictive capacity • Lack of fire management capacity including prevention and response • Poor inter-agency coordination on fire management 	<ul style="list-style-type: none"> • Lack of reliable statistical data on fires and their origin • No reporting on fires outside forest and protected areas e.g. fires related to agricultural activities
Forest assessment / inventory / monitoring	<ul style="list-style-type: none"> • Poor data leads to inability to plan for rational and multifunctional forest use • Lack of information on forest change patterns and associated drivers • Forest related data is scattered 	<ul style="list-style-type: none"> • Lack of updated forest inventory data • No platform for consolidating forest related data generated by different organizations
Protected area management	<ul style="list-style-type: none"> • There is no plan for spatial development of protected areas that would support increase of protected area coverage and connectivity • Lack of effective management of protected areas and biodiversity conservation • Lack of rapid alert system for protected areas 	<ul style="list-style-type: none"> • Limited information on biodiversity and its trends • Lack of effective mechanism for collecting, storing, and analyzing data on PA forests • Lack of law enforcement since park rangers are not aware
Forest carbon stock analysis and management	<ul style="list-style-type: none"> • Inadequate forest carbon data for national GHG inventory including changes in forest and other woody biomass stocks • Lack of data on conversion of forest and grass land to arable land 	<ul style="list-style-type: none"> • Lack of updated forest inventory data • Lack of data on annual forest dynamics • Limited data on tree species composition • Lack of data on land use changes
Reforestation	<ul style="list-style-type: none"> • Extensive areas of degraded forests due to unsustainable forest use, illegal logging, overgrazing, mining, pests and diseases, and forest fires • Resulting declines in forest density • Difficulties in monitoring and quantifying areas of restored forests or afforestation 	<ul style="list-style-type: none"> • Lack of data on areas needed restoration or afforestation

Madagascar. Annual deforestation rates are comparatively high, at an estimated 0.4% annual rate for the period 2005-2010. Forest cover within protected areas is constantly shrinking because of subsistence agricultural activities by neighboring communities, such as the collection of fuel wood or wood to produce charcoal, illegal collection of forest products and sub-products. The deforestation rate in the protected areas is 0.2% per year for the 2005 – 2010 period.²⁰ This rate remains high, even though it is below the national average.

Halting deforestation requires diversified data and information from different sources, including data on forest cover, land use allocation, land use, demography, and infrastructure. Furthermore, a cross-cutting and integrated strategy against deforestation requires centralized data and information.

Information-related barriers play an important role in enabling deforestation and forest degradation to persist in Madagascar. There is no national structure that is adequately equipped to ensure the effective availability of forest information. Although the Forest Administration has primary responsibility for collecting and managing forest information, it lacks the necessary means to do so effectively. Data are scattered within silos among various institutions, unavailable for inspection or use by other interested parties or the public.

As a result, accurate and timely information on forests in Madagascar is scarce, and the information that does exist is not easily accessible by civil society, private institutions, or even by different governmental bodies. Data related to forest cover and associated changes typically goes back only a few years, e.g. IEFN (1996 – 2006), CI (2009), ONE (2010)²¹. Thus, deforestation rates are estimated by a deductive method, based on data from these landmark years. In addition, an analysis of the availability of data and forest information in Madagascar reveals a regional misbalance, with data on the tropical rainforests in the eastern part of Madagascar more readily available than data on dry deciduous forests in western Madagascar.

Moreover, the lack of information flow horizontally between stakeholders and vertically between regional and national offices is another factor hindering improved forest management. Although the Forest Administration maintains a Forest Management Database office, information from regional offices is often not relayed to the central Forest Administration office; when forest information does reach the national office, other offices within the Forest Administration do not relay the information to the Forest Management Database office.

There are no magazines or periodicals specialized in communicating forest information regularly. The only institution authorized to carry out this activity is the National Institute of Statistics (INSTAT) and the FTM (Foibe Tao-tsaritany Malagasy), which is Madagascar's cartographic institute. However, FTM does not have accurate and timely data on deforestation and forests in general.

Table 2 below summarizes the baseline situation and barriers related to specific areas of forest management in Madagascar.

²⁰ As reported by the National Office for the Environment (ONE), MEEF/DGF, the Foibe Tao-tsari-tany Malagasy (FTM), MNP on the “Evolution of the cover of natural forest in Madagascar between 2005-2010”.

²¹ www.pnae.mg

Table 2: Baseline situation and barriers related to forest information, by management areas affected in Madagascar

Thematic area	Baseline situation	Key data and information-related barriers to more effective management
Management of production forests	<ul style="list-style-type: none"> Information, such as concession areas, authorizations, and trade is fragmented among different government divisions, both at the national and regional levels Forest administration has established a participatory control system involving grassroots communities and local authorities. The forest tax system has also been improved so as to motivate the affected entities in forest surveillance and control 	<ul style="list-style-type: none"> Limited baseline information on forest conditions Lack of a platform that would ensure easy access to information on issued licenses and related materials Information fragmented among different offices, both nationally and regionally Information often available only in print format
Protected area management	<ul style="list-style-type: none"> Madagascar's protected areas now cover approximately 6 million hectares across the country Management is highly decentralized between governmental, nonprofit, private, and community organizations After the political crisis began in 2009, protected area management suffered as donors' funding significantly decreased A new, democratically elected president took office in early 2014 and pledged to increase accountability in forest management, including combatting illegal logging trade 	<ul style="list-style-type: none"> Limited information on biodiversity and its trends Lack of effective mechanism for collecting, storing, and analyzing data on protected forests Limited baseline information on forest conditions Lack of updated forest inventory data
Decentralization	<ul style="list-style-type: none"> Communities have been granted management authority over certain forests for more than a decade Results of community managed forests have largely been poor across the country owing to low economic impact of the actions, low level of capacity building for the community, and competition with other forest uses In some cases, domestic and international nonprofit organizations support the community forest managers. These scenarios tend to have better quality results compared to forests where communities are not supported. 	<ul style="list-style-type: none"> Lack of updated forest inventory data Lack of centralized information concerning rights to land and resource use Lack of systematic process to relay information from decentralized forest managers to centralized location
REDD+	<ul style="list-style-type: none"> Madagascar communicates its greenhouse gas inventory (LULUCF sector) in national communications every 4 years Four REDD+ pilot projects are currently underway in Madagascar. These are supported by international nonprofit organizations. Madagascar recently submitted in July 2014 its RPP to the Forest Carbon Partnership Facility 	<ul style="list-style-type: none"> Limited baseline information on forest conditions outside of existing carbon credit projects Lack of updated, centralized forest inventory data Lack of centralized data on annual forest dynamics Limited centralized data on tree species composition Lack of centralized data on land use changes No platform for consolidating forest related data generated by different organizations

Thematic area	Baseline situation	Key data and information-related barriers to more effective management
Mangroves	<ul style="list-style-type: none"> • Mangroves are threatened by many activities such as fuelwood collection, conversion to agricultural use, and aquaculture, as well as being impacted from the impacts of upstream erosion • Multiple international nonprofit organizations are supporting site-specific mangrove programs, including community managed areas and the development of blue carbon projects 	<ul style="list-style-type: none"> • Limited capacity in technical aspects (elaboration of reference levels, MRV, results-based actions, etc.) • Lack of data on land use changes • Limited information on biodiversity and its trends • No platform for consolidating forest related data generated by different organizations
Mining	<ul style="list-style-type: none"> • Both large-scale industrial mining as well as artisanal mining threaten Madagascar's forests • Industrial mining operations have displaced local communities, including the destruction of subsistent agricultural land • The Office of Mining Registry is charged with managing information on exploitation, research, and operational permits. • Alliance Voahary Gasy, a national association representing more than 30 domestic nonprofit organizations, has developed a framework for guiding the development of good governance for extractive industries 	<ul style="list-style-type: none"> • Information concerning concessions fragmented among different government divisions • No platform for consolidating forest related data generated by different organizations • Limited information on biodiversity and its trends • Lack of data on land use changes
EIA	<ul style="list-style-type: none"> • To spur economic growth, Madagascar's government is actively encouraging, international investments in large-scale mining, industrial, and tourist projects • Madagascar has created an Interdepartmental Mining and Forests committee to harmonize management of both sectors and to process disputes • Interdepartmental orders have been issued to suspend mining permits in protected areas and production forests 	<ul style="list-style-type: none"> • Information concerning EIAs of study sites not easily accessible • Information on peripheral impacts not detailed or easily accessible
Watershed and water resources management	<ul style="list-style-type: none"> • Evidence of erosion in widespread throughout Madagascar, largely due to subsistent shifting swidden cultivation, which is one of the largest causes of deforestation in Madagascar, including on hillside lands. • Massive deforestation of catchment areas limits soil infiltration, degrading water quality and depleting source waters 	<ul style="list-style-type: none"> • Limited baseline information on forest conditions • Lack of updated forest inventory data • Lack of data on annual forest dynamics • Lack of data on land use changes • Limited data on water quality conditions

2.4 Institutional, sectoral, and policy context

Georgia. In 2007-2008, the Georgian government launched a forest reform process that drastically changed the system of forest licensing and forest institutions. It shifted most forest management responsibilities from the government to the private sector (including to long-term forest use license holders). However, this process largely failed to follow sustainable forest management principles, given that it was not accompanied by the establishment of relevant legal frameworks, institutional capacity or forest planning/inventory instruments and information.

Nevertheless, the need to strengthen forest information systems to ensure more rational and multifunctional use of forests is well reflected in the National Forest Concept of Georgia, which was approved by Georgia's Parliament in December 2013. The National Forest Concept calls for the following:

- forest inventory that ensures comprehensive determination of forest boundaries, conditions and basic qualitative characteristics/values of groves;
- categorization of forest according to their value and functional purpose;
- creating a system which would enable responsible authorities as well as other stakeholders to monitor forests, the forest sector and related ongoing processes.

According to the Concept, this system should be complementary to other systems, e.g. a national biodiversity monitoring system. Finally, the Concept emphasizes the need to identify degraded forest areas and areas appropriate for restoration and afforestation and planning as a first step towards implementing remedial measures.

Other elements of the reform process include²²:

- **Law on Managing Forest Fund**²³ (2010): This law regulates management of the forest fund by the National Forest Agency, outlines competencies and responsibilities of the Agency, including related to forest inventory and monitoring. Forest use plan are developed on the basis of forest management plan. Based on the inventory, license holders develop forest use plan.
- Development of a new **Forest Code** is underway, with a first draft expected in early 2015.
- **Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures:** The order defines 25 biodiversity indicators, including those related to forest, corresponding methodologies for their description and related procedures. The aim is to create a unified biodiversity monitoring system and to promote data exchange in order to obtain adequate information on biodiversity and trends, create response system and integrate this into national policies. Source of information for biodiversity monitoring (calculation of indicators) could be information received from state and non-governmental organizations; information produced within the Ministry; information produced on the basis of purchased services by the Ministry; information produced as a result of donor support by request of the Ministry and other. Service of Biodiversity Protection processes information and conducts monitoring according to approved indicators. Based on biodiversity monitoring results and when needed also recommendations of the council, the Ministry can develop recommendations on measures to be implemented for biodiversity protection and improved management of this field, and implement these measures accordingly.²⁴

²² A more comprehensive discussion is presented in **Annex 17**.

²³ Forest fund is defined as national forests and associated lands and resources.

²⁴ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

Since March 2013, responsibility for forests has shifted back from the Ministry of Energy to the new Ministry of Environment and Natural Resources Protection (MoENRP).

Madagascar. In recent years, Madagascar has implemented a number of measures aimed at better management of its forest resources and limiting their degradation. Aware of the issues of increased degradation of the environment and the loss of biodiversity related to the economic situation and poverty, the Government drafted its National Plan for Environmental Action (PNAE) in 1989, with the support of the World Bank, international agencies and non-governmental organizations. In 1990, the adoption of the charter of the environment (law No. 90-033 of December 21, 1990, on the Charter of the environment) completed the general framework for executing the National Environment Policy; it includes goals and a strategy to be implemented through three five-year Environmental Programs. The Charter on the Environment is currently being updated.

Regarding climate change, the Government created the Climate Change Department, within the Ministry in charge of the Environment, by decree n°2010-647 of 6 July 2010 on the Ministry of Environment and Forestry attribution and the general organization of the Ministry. The Climate Change Department was established to ensure implementation of the UNFCCC Convention, and to coordinate all the actions related to this Convention.

In 2010, Madagascar established the National Policy to Fight against Climate Change, which contains five strategic axes related to Adaptation, Mitigation, climate change sectoral integration, financial and research aspects. Currently, Madagascar is developing its National Mitigation Strategy. Finally, a series of National Mitigation Appropriate Actions (NAMAs) of Madagascar has been elaborated and submitted in 2010 to the UNFCCC.

As financial and human resources became scarce towards the end of the 1975–1991 socialist revolution, it became obvious that the forest administration was ineffective in managing the country's forest heritage. At the same time, the early 1990s saw more awareness of policy makers on the need to include local people in the resource management process. From an economic point of view, economic liberalization (privatization) and decentralization have led to changes in the structure and management methods in the forestry sector. Thus, the Malagasy Government has launched a review of the forestry legislation pursuant to the Law No. 97-017 of August 8, 1997. A new forest policy was adopted in October 1997 by Decree No. 97-1200 of October 2, 1997, on the adoption of the Malagasy forest policy. Since then, various measures related to forest management have been taken in order further to strengthen the process:

- The law No. 96 025 establishing local management of renewable resources
- The decree No. 98-782 regulating logging
- The decree No. 99-954 of December 15, 1999, on the compliance of investment with the environment
- The decree No. 99-954 of December 15, 1999, as amended by the decree No. 2004-167 of February 3, 2004, on the implementation of Compliance of investment with the environment (MECIE)
- The decree No. 2001-122 of February 14, 2001, laying down the requirements for implementing the contractual management of state forests.
- The Code of Protected Areas (COAP) according to the law No. 2001-05 of February 11, 2003, on the Code of protected area management
- The decree No. 2002-793 establishing incentive measures to prevent and eradicate bushfires

Furthermore, for a more effective conservation and in order to express its absolute will to conserve the unique biodiversity, Madagascar signed several international conventions:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora or CITES: 1975
- RIO Convention on sustainable development: 1995
- Convention on Biological Diversity (CDB): 1995
- Convention on Climate Change (UNFCCC): 1998
- Convention to Combat Desertification: 1997

During the World Parks Congress in Durban, on September 17, 2003, Madagascar committed to increase the coverage of protected areas from 1.7 million to 6 million hectares within five years, and in reference to the categories of IUCN's protected areas.

In summary, in terms of policy, legislation and institutional Madagascar seems to be emerging from a period of lethargy characterized by loosening of natural resources management; it now has legislative and institutional assets necessary to develop a more coherent management of its natural resources.

2.5 Stakeholder mapping and analysis

During the PPG phase, national-level stakeholders were consulted within both pilot countries during the course of two missions per country. These included both inception and validation workshops in each country, during which a wide range of stakeholder views was taken on board. In addition, during the course of identifying data availability and needs, and designing use cases, national consultants held numerous bilateral, cross-sectoral meetings with potential project partners.

At global level, discussions were held among GFW Partners throughout the course of the PPG, culminating in a Partnership meeting held at WRI headquarters in September 2014. This meeting helped to define priority directions for 2015 and beyond. Conclusions regarding future strategies for the GFW Partnership are closely reflected in the project's global components.

This section introduces key stakeholders and their relationship to the issues covered by this project, at both pilot country and global levels. Section 5 below expands on this base in describing the ways in which the project plans to engage with stakeholders during the full project. Further pilot country details, including stakeholders identified as implicated by specific use cases, are presented in **Annexes 17 and 18**.

Global. Key categories of stakeholders at global level include the following:

- *Governments:* Public agencies have done a mixed job of ensuring that information to improve forest management is publicly available. While key entities like NASA and the European Space Agency make vast amounts of semi-processed information available, this information is not further processed into formats that are easy for non-technical users to understand and apply to their day-to-day decision making. That said, many governments are now encouraging improved information sharing, and linking this to efforts to improve transparency and governance, such as through "open government processes," as well as linkages to market mechanisms.
- *Private sector:* Enlightened leadership across dozens of global corporations, from Disney to Unilever, from McDonalds to their major beef suppliers in Brazil, and palm oil producers in Southeast Asia, is seeking practical means to reduce deforestation and degradation in their supply chains. These efforts are just beginning, and are gaining prominence, with for example the work of the Consumer Goods Forum and WWF, but they lack the practical tools to measure and monitor progress. In-depth discussions by WRI's team with a number of these companies shows there is strong demand for GFW to help to address this need.
- *NGOs:* NGOs play a vital role in convincing and supporting governments and business to undertake needed reforms through evidence-based research and advocacy. NGOs also play critical watchdog roles when accountability mechanisms fail. Leading global and national campaigning

groups, such as Greenpeace and WWF have indicated strong support for GFW and were actively involved in providing feedback to WRI as the system was being designed and prepared for launch. However, NGOs often lack access to reliable and timely information that they can use as evidence for their advocacy and to hold governments and businesses accountable. They also often lack the technical tools and expertise to work with data and maps.

- *Local people / communities*: Local people most directly determine the fate of much of the world's forests and have the most at stake when forests and land are poorly managed. They must actively hold each other as well as governments and business to account, which requires easy, no-cost, access to non-technical information, with minimal training requirements. Most local communities lack access to information as well as information communication technologies, which they need to become more effective participants in local resource governance.
- *Donors and policy makers*: These entities contribute to incentivizing and supporting improvements in accountability, including through performance-based financing, trade policy, and development assistance. They require more timely and fine-grained information about forests so that they can better design and implement their interventions, including ensuring safeguards are followed and unintended consequences are addressed.
- *Researchers and academia*: Effective policy making is informed by good science and analysis. Researchers trying to understand the drivers of deforestation and degradation have been hampered by lack of frequent updates in data about forests, making it harder to correlate causes and effect of change. With the higher temporal resolution of GFW, as well as more ready access to detailed, spatially-explicit information, analysts will be able to perform a host of new research, and those with fewer resources in developing countries, as well as students, will be better able to engage in such research the world over.

Georgia. Among the key stakeholders involved with forest data and information management and use in Georgia, and of relevance to the project, are:

- *Forest Policy Service* a structural unit of Ministry of Environment and Natural Resources of Georgia participates in development of national policy in forest management and supports its implementation; develops forest strategy; reviews proposals on adjustment of forest borders and prepares corresponding recommendations; develops recommendations based on forest monitoring results. The Forest Policy Service may request and obtain needed information and materials relevant for implementing their competences from other state structures.²⁵
- *National Forest Agency* a legal entity of public law under Ministry of Environment Protection and Natural Resources of Georgia manages Georgia's forest fund. This includes conducting forest inventories, forest monitoring and analysis of obtained data. The Agency has nine territorial units throughout Georgia.
- *Agency of Protected Areas*, a legal entity of public law under Ministry of Environment Protection and Natural Resources of Georgia, manages protected areas through 22 PA territorial administrations throughout Georgia.²⁶ Among other responsibilities, the Agency develops management plans and monitors their implementation; manages natural resources within the protected areas and ensures their registration/inventory; organizes monitoring and scientific research and processes, and stores and distributes obtained information, including GIS data bases related to protected areas.
- *Service of Biodiversity Protection*, a structural unit of Ministry of Environment and Natural Resources Protection, participates in the development and implementation of national policy on

²⁵ Statute of Forest Policy Service, approved by Order N18 of the Ministry of Environment and Natural Resources Protection of 10 May 2013

²⁶ Statute of Agency of Protected Areas, approved by Order N3 of the Ministry of Environment and Natural Resources Protection of 10 May 2013

protection of biodiversity components and management of biological resources. This includes organizing and coordinating the state system of biodiversity monitoring. The Service of Biodiversity Protection may request information and materials from other state agencies needed for implementing their competences.²⁷ Service of Biodiversity Protection processes information received from state, non-governmental and other organizations on approved biodiversity indicators and implements biodiversity monitoring.²⁸

- *Service of Climate Change* participates in development and implementation of the national strategy and policy on climate change; coordinates reporting to the UNFCCC in collaboration with relevant stakeholders and conducts regular national inventory of GHG and reports to the UNFCCC and others.²⁹
- *Department of Environmental Supervision* is a sub-agency structure of the Ministry of Environment and Natural Resources Protection. It implements state control in the field of environment protection and use of natural resources including biodiversity and forest protection and use of natural resources, and controls implementation of license conditions related to environment and natural resources use. The Department prevents, detects and suppresses illegal use of natural resources and pollution of the environment; controls implementation of conditions under licenses, including general license for forest use, special license for timber production and special license for hunting. The Department has eight territorial units throughout Georgia.³⁰
- *Department of Licensing in the National Environmental Agency*, a legal entity of public law under Ministry of Environment and Natural Resources Protection, issues licenses for natural resources use (except from oil and natural gas), including licenses related to forests. The latter include general licenses for forest use, special license for timber production and special licenses for hunting. The Department receives and processes all documentation submitted by license seekers and submits this to structural sub-divisions and other agencies of the Ministry for their review. Additional responsibilities include: organizing field expeditions; organizing auctions and ensures publishing corresponding information in printed media; establishing natural resources use quotas for license holders; running a registry on issued licenses; handling violations of license conditions, and; developing maps and registries on mineral deposits, etc.³¹
- *Environmental Information and Education Centre* is a legal entity of public law under Ministry of Environment and Natural Resources of Georgia. It is responsible for ensuring public access to environmental information, public participation in environmental decision-making and access to justice on environmental matters, as well as supporting public awareness raising and professional training of the staff from different stakeholder organizations. The Centre creates and administers a unified environmental data base on environmental information in collaboration with other public, academic, educational, non-governmental, private and international organizations; collects and distributes environmental information; collects statistical data related to the environment; creates environmental library, including electronic materials; supports creation of the register on pollutant emission distribution; ensures public access to environment related information through the webpage and other electronic means as well as media; ensures public access to information on

²⁷ Statute of Service of Biodiversity Protection, approved by Order N11 of Ministry of Environment and Natural Resources Protection of 10 May 2013

²⁸ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

²⁹ Statute of Service of Climate Change, approved by resolution N23 of Ministry of Environment and Natural Resources Protection of 10 May 2013

³⁰ Statute of Department of Environmental Supervision, a state sub-agency structure of the Ministry of Environment and Natural Resources Protection approved by Order N26 of Ministry of Environment and Natural Resources Protection of 10 May 2013

³¹ Statute of National Environmental Agency, approved by Order N27 of Ministry of Environment and Natural Resources Protection of 10 May 2013

licenses and permits related to natural resources extraction and use; and organizes training courses for different target groups.³²

- *Department of Emergency Management*, under the Ministry of Internal Affairs, is responsible for coordinating actions for: emergency prevention and elimination, and mitigation of their consequences; ensuring fire safety in the country and implementing measures for emergency mobilization preparedness.³³ The Department is responsible, *inter alia*, for developing main directions of state policy in the field of fire safety and supervises their implementation. It is also responsible for organizing the state statistical system on fires.³⁴
- *National Agency of Public Registry* registers ownership rights and develops and updates real estate cadastre database.³⁵
- *Adjara Autonomous Republic Forest Agency* manages forest management within the borders of Adjara Autonomous Republic. The Agency is responsible for forest protection, tending and recovery; sustainable use of biodiversity within the forest fund; supporting demarcation/ adjustment of forest borders; managing forest fund; regulating forest use; forest inventory; implementing forest recovery measures; controlling territory of forest fund; implementing fire prevention and firefighting measures.³⁶
- *Local Self-Governance Authorities* have a formal responsibility for managing forests of local importance.³⁷ They are responsible for: supporting implementation of forest tending, protection, restoration, and firefighting measures; issuing forest use permits; submitting recommendations to the responsible national agency regarding restriction, suspension or termination of forest use rights on their territories; developing corresponding local programmes and supporting their implementation; participating in emergency response, and other.³⁸ Due to a lack of capacity and actual implementation mechanisms, local authorities are not currently fulfilling most of their forest management related responsibilities.

Madagascar. The economic and ecological importance of the forest gives it a multi-sectoral nature, making deforestation a society-wide issue. The non-exhaustive list below indicates the stakeholders implicated in this challenge:

- The *Government* as a whole, represented by the various ministries and related agencies that contribute to improving natural resource governance (Ministry of the Environment, Ecology and Forestry, Ministry of Water, Ministry of Agriculture and Rural Development) and planning (Ministry of Landscape Development) including through more effective enforcement of the law in their respective sectors.
- The *Climate Change Department (DCC)* is a structure within the MEEF, General Department of Environment. Its main responsibility is to insure the effective implementation of the UNFCCC and coordinate all related actions to the Convention. The DCC participates in development and implementation of the national policy and strategy on climate change; reports to the UNFCCC the National Communication every four years. The National Communications contains the national circumstances, the national greenhouse gases inventory (agriculture, waste, energy, industrial

³² Statute of Environmental Information and Education Centre, approved by Order N6 of Ministry of Environment and Natural Resources Protection of 10 May 2013

³³ Statute of the Ministry of Internal Affairs, approved by Resolution N337 of the Government of Georgia of 13 December 2013

³⁴ Statute of the Department of Emergency Management approved by Order N994 of the Ministry of Internal Affairs of 31 December 2013

³⁵ Statute of National Agency of Public Registry approved by Resolution N835 of Ministry of Justice of Georgia of 19 July 2004

³⁶ Statute of Adjara AR Forest Agency, approved by Resolution N55 of Adjara AR Government of 7 December 2010

³⁷ Organic Law of Georgia Code of Local Self-Governance, 5 February 2014

³⁸ Forest Code of Georgia, 22 June 1999, Article 13

proceedings, land use/land-use change-Forestry (LULUCF) sectors), the adaptation and vulnerabilities analyses, the analyses of mitigation of greenhouse gases options, and additional information relevant to the UNFCCC.

- The *Office Nationale de l'Environnement (ONE)* plays an important role in disseminating information on the environment at the national level. ONE publishes and updates regional and national environmental terms and specifications. These latter indicate the condition, pressures and conservation measures for the environment in Madagascar. ONE, working in collaboration with MEEF, MNP, CI and FTM, recently prepared a deforestation map for Madagascar covering the period 2005 to 2010. A follow-up map (2010–2014) is currently being designed.
- The *SGBDF* or Forest Database Management Office within the Office of the Director General of Forest compiles information from the Regional Offices of the Environment and Forest. These are presented as report of activities on topics such as reforestation completed, bushfires, logging, etc.
- *Domestic and international NGOs* working in environmental conservation and development collect process and disseminate information and thus add to the list of data sources. They include:
 - *National Observatory of the Environment and the Forest Sector (ONESF)*: The ONESF is an autonomous and independent body for information collection and analysis, which monitors governance of environmental programs and actions, as well as forest activities by the public or private sectors. ONESF collects, analyzes, disseminates and monitors the evolution of environmental and forest information and data. It provides recommendations that are used as elements of direction or correction for decisions affecting the environment and the forest sector or any related operations. The ONESF also provides support in the control and monitoring of missions in the field of environmental and forest activities.
 - *Foibe Tao-tsaritany Malagasy (FTM)*: FTM is an agency of the State Ministry for Infrastructure, Equipment and Territorial Planning. It is the key player in mapping at the national level, with primary responsibility for creating / verifying maps for use by the government. FTM's department for Geographic Information System (GIS) possesses a number of human and material resources related to image processing and GIS.
 - *Association of Networks of Environmental Information Systems*: The ARSIE is a non-profit organization established in May 1999. Its mission is to facilitate and stimulate the flow of reliable information and data about the environment in Madagascar.
- *Local communities* managing natural resource in their local community, especially Communautés de Bases (COBAs), and other grassroots organizations relying on forest resource use.
- *International public and private investors and donors*, which can more effectively target their impacts thanks to an increased ability to track and analyze results and trends. Specific donors and projects relevant to the GEF project are described in section 2.6 below.
- *Scientific communities*, use globally consistent data to foster a better understanding of the causes of deforestation and degradation, to develop more accurate and timely global models addressed to policymakers. A key stakeholder in this context is the National Committee on Remote Sensing (CNT).
- *Civil society and the media* contribute to policy debates and fight against corruption. They are effective advocates for forests and are the ones who can mobilize public opinion on the action against deforestation.

2.6 Baseline analysis and gaps

Global. In recent years, there have been significant improvements in forest governance in many countries, such as decentralization of authority, recognition of local and traditional resource claims and rights, and certification systems that better connect concerned consumers with products of improved management. Growing concern internationally about forest loss, demands from consumers,

Table 3: Some achievements of the first version of Global Forest Watch (2005-2013)

Country	Description
Cameroon	With assistance from WRI's Global Forest Watch Team, in 2005 the Cameroon Ministry of Forests and Wildlife began using an interactive forestry atlas developed by WRI and its partners. The atlas is the most effective source of forestry information available in Cameroon. With it, Cameroon has been able to monitor forest activities and manage its forest concession allocations.
Russia	<p>The Russian environmental group SPOK, for example, relied on WRI's boreal maps in its negotiations with Karellesprom, a major logging company, to spare an unprotected section of one of Europe's last remaining primary forests. The Forest Stewardship Council (FSC) has been using GFW maps across Russia to ensure that certified companies take proper account of large forests. Forest companies doing business in boreal forest regions have also been guided by GFW maps.</p> <p>Using satellite imagery and field visits, the Global Forest Watch Russia network mapped conservation values in Russia's forests and made the results publicly available. These maps influenced the Russian government as it prioritized new areas for protection and drew the boundaries of three new national parks. Similarly, the forest-rich Republic of Karelia bordering Finland relied on Global Forest Watch Russia maps and data for its new forest plan, which outlines thirteen new protected areas and identifies future areas for protection.</p>
Indonesia	Indonesia's Kalimantan Province, on the island of Borneo, is a resource rich region subject to forest fires that regularly break out during dry spells because of the spread of illegal land-clearing fires. Indonesia is the fourth largest global emitter of greenhouse gas emissions, and forest fires are a significant contributor to these emissions. A "fire atlas" produced by WRI, its local partners, and the Indonesian Ministry of Forestry (now part of GFW) has helped the government improve its monitoring fires and land clearing, thereby enabling the government to shift money and resources to at-risk protected areas. This was followed by a fire atlas for all of Indonesia.
Republic of Congo	WRI has been working with the Republic of Congo's Ministry of Forest Economy and a Congolese environmental group since 2004 to help that country gather and digitize data on all its forest concessions, logging roads, and protected areas for the first time. Forests cover 22 million hectares, almost 65% of Congo's territory. Forestry related revenue is second only to that of petroleum to Congo's economy. Combined with training programs, the <u>interactive forest atlas</u> produced through this collaboration helps the Congolese government better monitor and manage its forest concession titles, adjust taxable areas accordingly, and prioritize its limited resources to combat illegal logging by dispatching field control units to investigate pre-identified problem areas rather than stumbling upon them.
Gabon	With assistance from WRI and World Wildlife Fund, Gabon has improved transparency and access to natural resource information by combining forestry, mining, and conservation land use data into a <u>single, public information atlas</u> . Recognizing the need for vastly improved coordination between various land allocation ministries, as well as the importance of reliable, high quality information for decision-making, the Ministry of Mines, Petroleum, and Hydrocarbons led the initiative in collaboration with the Ministry of Water and Forests. As a result, Gabon has begun to tackle conflicting land use claims and plan for comprehensive and coordinated land use allocation at the national level. In addition, industry and the public, armed with information, can <u>participate more actively in decision-making</u> and monitoring activities. This multi-stakeholder, multi-sectoral, and transparent approach is setting the foundation for improved land use.

and local social pressures leading to demands for greater roles for local people in decision making, as well as climate change and donor influence, have all contributed to these improvements.³⁹ Indonesia and China, for example, have undertaken significant governance reforms related to land and resource

³⁹ A. Agrawal, A. Chhatre and R. Hardin, 2008, Changing Governance of the World's Forests, *Science*, 320, 1460-1462 <http://www.sciencemag.org/content/320/5882/1460.full#aff-1>

tenure by marginalized, poor, forest and land-dependent people. In Latin America, tens of millions of hectares of forest land has been returned to management by traditional, indigenous groups.⁴⁰ Meanwhile, however, in these and other regions, accountability mechanisms, transparency and channels of influence continue to require substantial attention. Improved flows of forest data and information continue to represent a key challenge in addressing the above issues.

As outlined in section 2.1 above, WRI launched the original Global Forest Watch (GFW) in 1997. GFW leveraged GIS technology to create maps of the great forest basins of the world: the Amazon, the Congo, Southeast Asia, Canada, and Russia. Equipped with this information, policymakers and nongovernmental organizations (NGOs) were able to develop better forest policies, establish protected areas, enforce laws and improve forest management (see **Table 3 above**). However, these maps were updated infrequently and were of relatively low spatial resolution, limiting their usefulness for real-time actions to address undesirable deforestation as it emerges.

WRI decided in 2011 to relaunch GFW. A prototype of the new GFW⁴¹ was presented at Rio+20 in 2012. Key partner organizations and financial donors joined in a Partnership, the first meeting of which was held in September 2013. In February 2014, following an active period of site development, the GFW beta website was officially launched.

GFW aims to *reduce deforestation, forest degradation, greenhouse gas emissions and poverty* by uniting technology, transparency, and human networks to mobilize faster, more effective, rights-based forest conservation and sustainable management. It applies cutting-edge science and technology to generate the timeliest, most precise, and most reliable information available about what is happening in the world's forests.

Through GFW, WRI and its partners seek to ignite a forest management transparency revolution by dramatically improving the availability and accessibility of forest information worldwide. GFW combines various near-real-time tree cover loss alert systems, complementary satellite imagery and monitoring systems, a suite of maps, mobile technology, and a networked world to create never-before-possible transparency for what is happening in forests everywhere. This transparency is enabling governments, communities, civil society, companies, and the media to hold those responsible for forests accountable at a pace that matches the modern world and the threats facing forests. The GFW platform is offering billions of people unrestricted access to this information in decision-relevant and actionable formats.

Early reaction to GFW has been highly encouraging. The effective design and functionality of the system, as well as the excitement that its launch has generated, are reflected in a number of metrics, including: some 1.3 million page views; over 1,020 media stories, and; almost 4,000 followers on Twitter with over 556,928 views of related tweets.

Key areas of global-level baseline activity related to GFW are described below.

1. GFW PLATFORM DESIGN, DATASETS, FEATURES AND FUNCTIONALITY

Since its launch, GFW has been providing timely, peer-reviewed, accurate, and transparent data and indicators of annual, semi-annual, and monthly (consolidated based on 16-day updates) rates of tree cover loss, forest degradation and tree cover gain at all geographic scales. These scales range from the local management unit such as an individual logging concession or community forest or protected area, to provincial, national and continental scales. GFW is greatly empowering researchers and their understanding of the drivers of forest cover change.

GFW is also facilitating the transparent *verification* of information provided by parties on changes in forest cover. GFW includes in-depth ground truthing and training of medium-resolution imagery (250m and 30m) with high-resolution imagery (0.3-5m, donated and or sponsored by 3rd parties by

⁴⁰ *Turning Point: What future for forest peoples and resources in the emerging world order?* Rights and Resources Initiative, 2012.

⁴¹ Initially known as 'GFW 2.0', now simply 'GFW'.

ScanEx, Google, ESRI, DigitalGlobe and Planetlabs), as well as through crowdsourcing of observations by people on the ground.

Table 4 below lists the datasets available from the GFW platform as of October 2014.

Table 4: Data layers available on GFW, as of October 2014⁴²

Data type	Data layer description	Technical parameters
Forest change	University of Maryland / Google tree cover loss	Annual, 30 m, global
	University of Maryland / Google tree cover gain	12 years, 30 m, global
	FORMA Alerts	Monthly, 500 m, humid tropics
	IMAZON SAD Alerts	Quarterly, 250 m, Brazilian Amazon
	QUICC Alerts	Quarterly, 5 km, <37 degrees north
	NASA active fires	Daily, 1 km, Global
Forest cover	Trees Cover Extent	Displaying extent with > 10% canopy density
	Intact Forest Landscapes	Degradation 2000-2013
	Tropical forest carbon stocks	Total biomass carbon (MG C HA-1)
	Indonesia Primary Forest	Intact / Degraded
Forest use	Logging	Varies by country
	Mining	Varies by country
	Oil Palm	Varies by country
	Wood Fiber Plantations	Varies by country
Conservation	Protected Areas	Monthly, varies by protected area
	Biodiversity Hotspots	Global, 2011. Updated as available
People	Resource Rights	Varies by country
	Land Rights	Global, 2011. Updated as available

To take just one example from the preceding table, the University of Maryland / Google tree cover loss layer displays tree cover over all global land (except for Antarctica and a number of Arctic islands) for the year 2000 at 30 × 30 meter resolution. “Percent tree cover” is defined as the density of tree canopy coverage of the land surface and is color-coded by density bracket (see legend). Data in this layer were generated using multispectral satellite imagery from the Landsat 7 thematic mapper plus (ETM+) sensor. The clear surface observations from over 600,000 images were analyzed using Google Earth Engine, a cloud platform for earth observation and data analysis, to determine per pixel tree cover using a supervised learning algorithm.

GFW’s features and functionality have also evolved quickly, often in parallel with the addition of new datasets. Features added or enhanced during the first half of 2014 include the following:

- Expanded analysis tool,
- Enhanced shareability,
- UMD/Google tree cover canopy thresholds,
- Sub-national statistics,
- Upgraded country pages.

⁴² According to http://www.globalforestwatch.org/sources/forest_change, accessed 20 October 2014

2. SYSTEM UPTAKE AND REPLICATION

The best information systems are not truly useful until they have been used to extract lessons which can then be put to practical use. Among the most critical such uses are related to efforts to reduce and potentially eliminate deforestation levels worldwide. Successfully transforming GFW information into action requires additional, concerted effort to raise awareness, build capacities and demonstrate effective uses for the system within countries around the world.

Effort to stimulate country-level uptake have been undertaken in a number of countries in 2014. These have included countries where national atlases had been produced in association with the original GFW—including all Central African countries and Indonesia—as well as efforts to reach out to important tropical forest countries such as Liberia, Mexico, Myanmar, Colombia and Peru as well as countries in the Central American and Mekong regions. In addition, within the context of the present project's PPG phase, two missions each took place in Georgia and Madagascar, helping significantly to raise awareness the actual and potential value of the GFW platform for local and national forest management.

Among the country-level actions that GFW aims to support are the following:

- Enabling sustainable landscape management and restoration by improving forest management, law enforcement and land use planning in key countries;
- Empowering local communities to strengthen their land tenure claims and meaningfully participate in local resource management decisions;
- Reduce deforestation and forest degradation linked to major global drivers, including agriculture, infrastructure, mining and logging.

Overall, the challenge of system uptake and replication is a major one and faces important constraints related to awareness and capacity, among others. It will be particularly important to learn from, and share, country experience regarding effective use of GFW for enhanced management.

3. STRENGTHENING AND SUSTAINING THE GFW PARTNERSHIP

Developing and sustaining GFW constitutes a massive effort and one which few organizations would attempt on their own. The GFW Partnership represents an innovative and extensive collaboration amongst an expanding network of partners, currently numbering over 40 members (see **Table 5** below).

Table 5: GFW Partners (as of October 2014)

Baker & McKinsey	GEF	Rainforest Foundation UK
Blue Raster	Global Forest Watch Canada	RSPO
Bobolink Foundation	Global Witness	ScanEx
BP-REDD, Indonesia Govt	Greenpeace	Tierra Minada
CartoDB	Google	The Tilia Fund
Center for Global Development	Imazon	Transparent World
CIAT	International Union for Conservation of Nature	University of Maryland
Climate and Land Use Alliance	The Jane Goodall Institute	Unilever
Conservation International	Ministry of Foreign Affairs of the Netherlands	UNEP
Danish Ministry of Foreign Affairs	Mongabay	UNEP - WCMC

Digital Globe	NASA Ames Research Center	USAID
UK DFID	Norwegian Ministry of the Environment	Winrock Vizzuality
Esri	OSFAC	World Resources Institute
Food and Agriculture Agency of the UN	Planet Labs	

Among the key challenges facing the Partnership is the need to ensure long-term financial sustainability, which needs to be based on careful analysis of cost efficiencies, costs of maintaining various system components, etc.

4. MONITORING AND REDUCING DEFORESTATION ASSOCIATED WITH COMMODITY SUPPLY CHAINS

GFW Commodities was launched at the Roundtable for Sustainable Palm Oil (RSPO) European Summit in June 2014, with a suite of web tools for business users in BETA. These tools are offering companies new ways to identify and address commodity-linked deforestation in their supply chains. For example, the initiative is shedding light on how individual oil palm concessions are affecting forests by surfacing datasets related to: (i) RSPO certified palm oil plantation areas; (ii) Southeast Asian peatlands, (iii) land cover in Southeast Asia, (iv) land cover in Indonesia, (v) global land cover and (vi) legal classifications of land in Indonesia.

The current set of web tools enables users to perform a variety of analyses, including the following:

- to overlay forest change data layers with additional contextual data layers (e.g. land cover, peat lands, primary forest, etc.) for analysis (e.g. annual tree cover loss broken down by land cover classification);
- to analyze areas of interest by selecting a feature on the map;
- to analyze areas of interest by searching attribute data of commercial entities (e.g. palm oil concessions);
- to analyze groups of entities (e.g. all concessions associated with a parent company);
- to produce on-the-fly analysis and reporting via tables and charts for above areas of interest.

Georgia. In September 2013, the MoENRP launched a process to elaborate a National Forest Programme. Among the major tasks in this process are to identify the most urgent reform needs, involve all relevant stakeholders in the forest reform process and co-ordinate corresponding support being provided by development partners. The important initiatives for this proposal, which have recently begun or are about to start are:

- Country-wide forest monitoring and the establishment of a forest monitoring system
- Development of an improved forest inventory and planning system
- Development of standards and guidelines for sustainable forest management

GIZ (Gesellschaft für Internationale Zusammenarbeit, Germany) supports the Georgian Ministry of Environment and Natural Resource Protection with its regional programme “Sustainable Management of Biodiversity, South Caucasus” in the field of forest monitoring. In Georgia, the project focuses on:

- Identification of forest cover: This will be based on RapidEye imagery (resolution: 6.5 m). RapidEye Level 1b imagery has already been procured (2011 with some scenes from 2012). The resulting forest cover map will be available as of November 2014.

- **Planning the development of a forest monitoring system:** While the baseline data are derived from RapidEye imagery (2011) and verified in the field (in 2014), future assessments will be based on Sentinel 2 images (resolution: 10 m), which will be free of charge after 2014.

Based on the National Forest Concept and the National Biodiversity Strategy and Action Plan 2014-2020, and with technical support from GIZ, the Ministry of Environment and Natural Resources Protection launched the National Forest Programme in early 2013. Thematic working groups have been established including representatives from all relevant government institutions, the NGO sector, the academic sector and private companies as well as independent experts. The main function of these working groups is to review policies, strategies and legal documents, which are under elaboration in the ongoing forest reform process. A specific working group is among other issues addressing forest monitoring and assessment. Another working group is involved in the legal reform process, especially the elaboration of the new Forest Code and the respective secondary regulation. The review of the forest legislation is being supported by the World Bank within the framework of the ENPI FLEG II Program.

In order to create a unified biodiversity monitoring system and to promote data exchange, the Ministry of Environment and Natural Resources Protection, also with the financial support of GIZ, has developed a Concept of National Biodiversity Monitoring System. The aim is to obtain adequate information on biodiversity conditions and trends, create response system and integrate this into national policies. 25 biodiversity indicators, including many related to forest, have been selected and grouped on the basis of a State-Pressure-Response approach. The indicators, methodologies for their description and related procedures have been approved by Ministerial Order.⁴³ Currently data collection according to the selected indicators is ongoing.

Another ongoing project is the “Sustainable Forest Governance in Georgia: Strengthening Local and National Capacity and Developing Structured Dialogue” implemented by CENN (Caucasus Environmental NGO Network), which aims to contribute to successful implementation of the forest reform by strengthening the capacities of authorities and civil society and enhancing issue-based policy dialogue. Among other activities, the project has initiated independent forest monitoring activities in regions in Georgia, involving local non-governmental organizations, media and private sector. In addition, in the framework of a pilot project component there is a proposal to create a forest portal and link it to an already existing Geo-Portal.⁴⁴ In addition, CENN has been developing forest zoning directive together with the Ministry of Environment and Natural Resources Protection. When finalized, this document will become a formal forest zoning guideline.

ENPI East Countries FLEG II Program, implemented by the World Bank in partnership with WWF and IUCN, is implementing a detailed forest inventory of Tianeti municipality.

In addition, it is planned to create a forest information database through the development of a Geo Portal for Georgian forests – “Geo Forest Portal” and Forest Resource Center, which will be delivered to the National Forest Agency. Possibly Geo Forest Portal will be incorporated into disaster Geo Portal of Natural Hazards and Risks in Georgia developed by CENN.⁴⁵

Apart from this, FLEG implements forest functionality analysis that implies studying dependency of local population on forests. Maps reflecting results of this analysis will be developed for Ajameti, Kintrishi and Mtirala protected areas.

Madagascar. There are several ongoing conservation and REDD+ pilot projects which are led by non-government actors, including five international NGOs (WWF, WCS, CI, Good Planet & Inter-Cooperation) and a range of donors (USAID, GTZ, Air France, and the Biocarbon Fund). Three of these (CAZ, COFAV & Makira) are already certifying their carbon credits on the voluntary market

⁴³ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

⁴⁴ Land Degradation Map of the South Caucasus Region, <http://land.cenn.org:8082/cenn/>

⁴⁵ <http://drm.cenn.org/index.php/en/>

using the Climate Community & Biodiversity Standard, while some of the pilot projects, e.g. REDD-FORECA (GTZ/IC), focus on generating knowledge and capacity building for REDD+ issues in Madagascar. The local NGO *Observatoire National de l'Environnement et du Secteur Forestier* is also committed to independent analysis and monitoring efforts but lacks the powerful on-line monitoring and analytical tools that GFW can provide. Overall, Madagascar still lacks access to credible, independent and frequently updated information about its forests and protected areas of the kind that GFW will provide.⁴⁶

Although the Forest Administration is charged with collecting and disseminating forest information, the agency is largely prevented from doing so due to the prohibitive financial costs of acquiring high quality data, the complex technical skills required in analyzing the data, and the existence of data that is not accurate, thorough, or consistent.

Due to the lack of accurate and easily accessible information, many governmental institutions and nonprofit organizations have expressed interest in, and need for, investments that contribute to the dissemination of information on natural resources.

Additionally, the eastern forests of Madagascar have attracted more interest historically, due to the area's relatively high conservation value compared to western forests in Madagascar. This has led to a significantly more information being collected and more conservation activities being concentrated on the eastern forests. Madagascar's western forests now experience higher rates of deforestation than do eastern forests.

Specific initiatives with which the GEF project will engage include:

- Manondroala Project: This project aims to map and classify all of Madagascar's forests using remotely-sensed data from satellites complemented by ground-truthed data provided by local communities. Currently, the project has three pilot sites, one each in Ranomafana, Andasibe, and Manombo. The project is funded by the Finnish Association for the Conservation of Nature. Transparent World provides satellite imagery and data analysis, while the Comité National Télédétection provides in-country technical support. The project is physically hosted by the Madagascar Institute for the Conservation of Tropical Environments. Manondroala activities and outcomes can inform the development and refinement of tree cover data for GFW, in addition to providing a pathway for involving communities in the monitoring and management of forests. The activities and results of the project can also inform land use planning efforts, such as watershed management, granting of production forest concessions, and designating protected areas.
- Institut et Observatoire de Géophysique d'Antananarivo (IOGA): The University of Antananarivo houses this institute, which grants master's level degrees in research in remote sensing in areas such as land cover mapping and seismology. In addition to providing analysis and validation of GFW tree cover products, IOGA will also guide the GEF project by supporting capacity building efforts in remote sensing and geospatial analysis.
- Comité National Télédétection: This committee, headed by IOGA, is an informal association that brings together different initiatives that focus on using remote sensing in their projects, such as supporting the Manondroala Project. The committee's involvement in the GEF project will involve performing analysis and comparison of remote sensing data for tree cover, as well as supporting capacity building efforts in remote sensing and geospatial analysis.
- Blue Ventures: This organization supports mangrove conservation along the west coast of Madagascar by working with local communities to monitor change and develop initiatives that inform community-based management of mangrove forests. GFW recently provided Blue Ventures with a grant to support the organization's work near Ambanja to map mangrove forest

⁴⁶ Independent Forest Monitoring Madagascar, *Madagascar Conservation & Development*, Volume 5 (1), pp. 64-71.

change and extent, in addition to providing narrative-based descriptions of activities affecting the mangrove forests, which GFW will host on its website. Additionally, Blue Ventures is engaging communities in the monitoring and reporting of biomass to estimate carbon storage, data which the organization intends to use to develop blue carbon projects. GFW's engagement with Blue Ventures in the course of the GEF project will inform and promote the development of how GFW can be utilized for community-managed forests, water resources, and REDD+ activities.

- **Rebioma:** Réseau de la Biodiversité de Madagascar is a project supported by Wildlife Conservation Society and the University of California, Berkeley to collect, host, and provide biodiversity data for promoting conservation activities. Rebioma's work so far has supported the selection of millions of new hectares designated as protected areas. GEF project activities will focus on merging data currently hosted by the Rebioma data portal with GFW's platform. These activities will directly inform GFW's applicability to protected areas management and intersectoral planning by providing biodiversity data complemented with existing GFW data and data expected to be acquired through GEF project activities.
- **REDD+:** As discussed above, Madagascar has several ongoing REDD+ project activities, in addition to blue carbon projects under development by Blue Ventures. GFW involvement in these projects will contribute to the development of a specific carbon-focused application for GFW, which would provide stakeholders with a widely accessible, inexpensive portal for certain information related to carbon project activities. In addition, since these REDD+ projects engage communities through active participation in the projects as well as sharing of benefits, GFW can provide a platform that focuses on the social and economic safeguards for, activities of, and impacts on local peoples.

Currently, Madagascar has several ongoing and planned initiatives on forests and REDD+. The country recently submitted its R-PP (REDD+ Readiness Proposal - January 2013). Furthermore there is a national REDD+ bureau and platform which brings together the various SFM and REDD+ initiatives. In order to manage all the carbon projects, in 2012 Madagascar established decree No 2012-690 on the carbon project proceedings approval and the implementation of a carbon registry in Madagascar.

- **WAVES:** The Wealth Accounting and the Valuation of Ecosystem Services project was established in 2012 to account for the economic and biophysical values of the natural resources of Madagascar, currently one of only eight countries worldwide implementing this program. The results of the project will integrate the wealth and valuation of natural resources into planning for development. GEF project involvement with WAVES will incorporate the information already collected, including data on protected areas, forestry, water resources, and mining. This data can then be displayed within a geospatial context for integration within all use case possibilities.

2.7 Linkages with other GEF and non-GEF interventions

The project is fully aligned with UNEP's mandate, with the *Bali Strategic Plan for Technology Support and Capacity-building*, with the goals of the UNEP Mid-Term Strategy (Ecosystem Management, and Environment under Review sub-programs), and with the current UNEP Program of Work. UNEP's Division of Environmental Policy Implementation and Division of Early Warning and Assessment (UNEP-DEWA) will be involved in technically supporting this GEF project. UNEP-DEWA focuses on environmental assessment, monitoring and capacity building. Establishing and maintaining effective partnerships and networks to keep the world environmental situation under review underpins the work program of DEWA and is consistent with UNEP's role as a catalytic organisation by mobilising institutional cooperation at the relevant level.

UNEP also works closely with a wide range of technical partners and UNEP satellite research centers that host relevant expertise and offer potential linkages for the GFW project, including, i.e.: GEMS Water, ECOLEX, AEIN, GEO Partners, UNGIWG, GEOSS, IWG – ENV, CCSA, Ecoinformatics, ESRI, GRID, AIT-UNEP Regional Resource Center for Asia and the Pacific, EWIN, AGEDI, Inter-agency and Expert Group (IAEG). The UNEP World Conservation Monitoring Centre (UNEP-WCMC) in Cambridge, UK is one of UNEP’s collaborating organizations which is a member of the GFW Partnership and already provides key data for GFW including e.g., datasets on protected areas and biodiversity. UNEP-WCMC is well placed to supply and provide advice on the interpretation and use of protected areas data. In addition they would ensure that any data collected or updated as part of the project is incorporated back into the World Database on Protected Areas (WDPA) at the end of the project.

Other UNEP global programs with relevance to the GFW include the “Eye on Earth” and the “Global Environment Alert System”. The ‘**Eye on Earth**’ is a ‘global public information network’ for creating and sharing environmentally relevant data and information online through interactive map-based visualisations. The overall goal is to improve the environment by sharing information and knowledge. The philosophy of Eye on Earth and GFW is similar and thereby stand to benefit from the lessons learnt under respective initiative and potential collaboration. The GFW has also a natural link to UNEP’s The **Global Environment Alert Service** (GEAS). UNEP’s regional offices for Africa (ROA) and Europe (ROE) will also provide liaison and technical support functions to support project implementation at the country level, in the project pilot countries.

The project is also closely linked and feeds into UNEP’s work stream on **Forest landscapes restoration, UN-REDD** under the CC sub-programme, **as well as on ‘landscape management of productive ecosystems’** in the frame of the PoW’s Ecosystem Management sub-program, Expected Accomplishment (a) which is led by the DEPI Terrestrial Ecosystem Unit (TEU), FEU, IEMP, WCMC and other partners. In this context, the lessons learned and methodologies emerging from GFW will inform and will be applied to a much wider number of other GEF and non-GEF projects in the UNEP portfolio. For example, the UNEP project: ‘landscape management of productive ecosystems’ includes a list of 42 GEF/UNEP projects which may offer the opportunity to further test and scale-up GFW results, and i.e. subsequently also expand the scope of GFW to become a valuable tool for broader ‘landscape monitoring’, beyond Forest ecosystems. The linkages between the GFW project and the UNEP ecosystem management portfolio (both GEF and non-GEF) will be ensured by the UNEP/DEPI/TEU maintaining a technical role in the GFW partnership and project steering committee.

Section 3: Intervention Strategy (Alternative)

3.1 Project rationale, policy conformity and global environmental benefits

Project rationale

Several factors indicate that the world has a unique opportunity to address the global forest information problem and, from there, achieve transformative outcomes for the world’s forests:

Technology. Recent technological advances enable the production and sharing of information more rapidly, inexpensively and widely than ever before. Satellite imagery continues to improve in resolution while dropping in cost. Within 1-2 years, micro-satellite technology may yield daily satellite imagery at <5 meter resolution for the entire globe. Advances in cloud computing enable rapid and inexpensive analysis of satellite imagery and other “big data”. Expansion of internet connectivity to even the most remote locations is creating unprecedented opportunities for mobilization and crowdsourcing.

Political will. The threat of climate change and better understanding of the role of forests in climate mitigation continue to generate high-level political will to protect forests. Billions of dollars in public and private funds have been committed to forest protection under the banner of REDD+. Governments in key forest-rich countries, such as Indonesia and Brazil, have made ambitious pledges to reduce

emissions from deforestation and forest degradation. Meanwhile, major international companies are under increasing pressure to eliminate deforestation from their supply chains and have made far-reaching commitments of their own.

Policy solutions. Decades of learning and experimentation in the forest sector have yielded promising, scalable policy solutions. Successful approaches for reducing deforestation and promoting sustainable forest management can be seen around the world. These include community-based forest management in Nepal, payments for ecosystem services in Costa Rica, and Brazil's effective combination of high tech monitoring, enforcement, and performance incentives—which helped to reduce deforestation there by nearly 70% in less than a decade. Improved access to high-quality information and related capacity building can be applied to scale up these approaches. Vested interests seeking to hinder progress on these issues can be counteracted by leveling policy playing fields through greater transparency.

Growing commitment to zero-deforestation commodity production. A number of factors are contributing here, beginning with increased traceability. Connecting the supply chains of companies with the point of production where deforestation is taking place is essential to driving change and will enable companies to evaluate supplier compliance with policies. As traceability has emerged, software companies have responded by launching new product traceability systems that bring down the cost and complexity of maintaining this information for companies. Meanwhile, investors are issuing new policies related to deforestation and deforestation-linked commodity production and sourcing⁴⁷ and are divesting entirely from the riskiest sectors. For example, the Consumer Goods Forum (CGF), a global membership group of consumer goods manufacturers and retailers representing over \$3.5 trillion in combined sales, announced a commitment to work toward ending tropical deforestation in deforestation-linked commodity supply chains by 2020. Following this announcement, CGF members together with the United States Agency for International Development (USAID) formed the Tropical Forest Alliance 2020 (TFA2020), a public-private partnership of companies, governments and civil society organizations dedicated to implementing the CGF commitment.

GFW is expected to improve the effectiveness and reduce the cost of forest and habitat conservation efforts in pilot countries (and globally) in the following ways:

- *More rapid response capacity:* GFW is allowing law enforcement and PA management agencies to achieve near-immediate response to tackle illegal deforestation activities, even in remote areas. This will dramatically reduce the impact of illegal activities that can often go unnoticed for extended periods due to lack of resources for patrolling and law enforcement on the ground or through aerial patrols.
- *Reduced enforcement cost:* Agencies are able to focus geographically interventions, using GFW near-real-time alerts. This will reduce the costs of expensive on-the-ground and aerial patrolling activities.
- *More effective advocacy:* GFW is a publicly accessible, user-friendly and transparent system. Advocacy groups, local communities, private sector and government alike are able to use GFW to support science-based advocacy and community mobilization in support of forest conservation interventions.
- *Increased accountability:* GFW is designed to deliver transparent, credible and unbiased information. This is providing the basis for:
 - (a) timely monitoring of private and public sector performance in forest management,
 - (b) defining and measuring baseline parameters, such as change in forest cover, for transactions in Payment for Ecosystem Services (PES) schemes,

⁴⁷ For example, HSBC recently announced a [policy](#) prohibiting their provision of financial services to agricultural commodity producers that undertake (among other things) illegal operations, land clearance by burning, or the conversion of areas (often forests) necessary to protect high conservation values.

- (c) enhanced measurement of changes in PA management effectiveness, and
- (d) rapid assessment of the impact of management measures in forest areas and PAs alike.

Each pilot country offers important global benefit and demonstration opportunities. The Madagascar pilot will support conservation of that country's critical and highly endemic biodiversity, while work in Georgia will help to demonstrate GFW's potential contribution to sustainable use and conservation of Mediterranean forests, with significant replication opportunities.

A critical assumption of the GFW initiative is that good information is a vital but not sufficient input to better decision-making about natural resource management. GFW's theory of change involves three components. This change theory underlies the entire GFW initiative as well as this project.

First, GFW aims to promote radical transparency by dramatically improving the availability and accessibility of timely, precise, and accurate information and analysis concerning the status of forest landscapes worldwide. Transparency is a core principle of good governance and a critical enabling factor to improve accountability and coordination within governments.

Second, GFW works with government, corporate, and civil society partners to identify and test opportunities to apply data in ways that support decision-making and improve on-the-ground implementation. The "use cases" proposed in this project will be the primary vehicle to apply GFW data directly in the context of relevant policy and implementation issues in Georgia and Madagascar. WRI is also working closely with the Governments of Cameroon, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon, Liberia and Republic of Congo to develop and apply nationally calibrated applications and datasets, powered by global GFW data. Through the analysis of these and other use cases being pursued by GFW globally (e.g. GFW Commodities), the project will create a strong case and a set of practical tools for changing business-as-usual practices. Part of the analysis under relevant use cases will involve the identification of target uptake pathways and related indicators.

Third, GFW seeks opportunities to replicate successful use cases regionally and globally to achieve impact at scale. The GFW partnership, which now includes over 60 organizations and companies, will provide a critical vehicle for replication and scaling. In addition, all GFW data and web-tools are open source, which enables anyone to apply or build from GFW resources. GFW is building a global network and community of practice through our online platform and global outreach strategies, which will enable good ideas to "go viral".

GFW does not propose to resolve all governance challenges in each country, but it can make significant contributions with respect to transparency and related tools to support greater government accountability, sector coordination, and civil society participation. GFW will seek to identify and collaborate with relevant initiatives in each country to seek a more holistic, long-term approach to improving the multiple dimensions of governance.

Policy conformity

This multi focal area project will support pilot countries that have allocated different combinations of their STAR resources to join this Global initiative, reflecting their specific national priorities and availability of STAR allocation at the time of submission (i.e. Madagascar: BD 2M and CCM 0,5M; Georgia: LD 1M and CCM 1M).

The project is aligned with Biodiversity Focal Area Objective 2: "Mainstream Biodiversity conservation and sustainable land use into production landscapes, seascapes and sectors" and will contribute to the achievement of Outcome 2.1: "Increase in sustainably managed landscapes and seascapes that integrate biodiversity conservation" and specifically to Output 2: "National and sub-national land use plans that incorporate biodiversity conservation and ecosystem services valuation".

The project is also aligned with the Land Degradation FA Objective 3: “reduce pressures on natural resources from competing land uses in the wider landscapes”, Outcome 3.1 “enhanced cross-sector enabling environment for integrated landscape management”, Output 3.1: “integrated land management plans developed and implemented”; and with the climate Change Mitigation objective 5: “Promote conservation and enhancement of carbon stocks through sustainable management of land use, land-use change and forestry”, Outcome 5.1 “Good management practices in LULUCF adopted both within forests and in the wider landscapes”, and Outcome 5.3 “GHG emissions avoided and carbon sequestered”. The project contributes significantly to the cross-cutting SFM/REDD+ Focal Area objective 1: “Reduce pressures on forest resources and generate sustainable flows of forest ecosystem services”, Outcome 1.1 “Enhanced enabling environment within the forest sector and across sectors”, as well as SFM/REDD+ objective 2 “Strengthen the enabling environment to reduce GHG emissions from deforestation and forest degradation and enhance carbon sinks from LULUCF activities” Outcome 2.1 “Enhanced institutional capacity to account for GHG emissions reductions and increase in carbon stocks.”

Global environmental benefits

As the home of two-thirds of all plants and animals living on land, forests are the most biodiverse terrestrial ecosystems.⁴⁸ Emissions from deforestation and forest degradation accounts for 15-17% of global human induced GHG emissions; without addressing poor forest management, it will be impossible to limit global warming to an acceptable level.

GFW is first and foremost about information and knowledge building. However, generating global environmental benefits (GEBs) requires that additional steps be taken beyond the level of information and knowledge. Individual actors—including governmental, non-governmental, private sector, local communities, etc.—will need to act upon improved information in order to effect change. Thus, while better information creates the conditions that enable improved management and benefit creation, those benefits are only generated when the information is used to transform action.

A fundamental concern of the present project is to better understand the complex relationship between, on one hand, improved forest information and, on the other, action that generates national and global environmental benefits. Thus, a central element of the project’s monitoring and evaluation approach will be to focus on improving such understanding. Global benefit generation and monitoring thereof, will take place at the following levels:

- *Target country level:* As noted below, GFW partners are reaching out to a number of target countries to encourage and support uptake of the system. This co-financed support will include efforts to correlate evidence of national and sub-national usage of GFW with resulting changes in deforestation levels. Target country benefits have not been included in the GEB calculations presented here, but could be added during the project period should strong evidence for them emerge.
- *GEF pilot country level:* The project design has deliberately emphasised national-level action as opposed to site-level demonstrations. This was due to the perception that management processes—particularly exchange of information between central and local management authorities—were critical and that there would be little advantage or cost saving accruing from a narrowly focused, demonstration site-based approach. In other words, a national and system-wide approach would have greater impact and be more cost effective than a more geographically focused one. In line with this thinking, GEBs presented here are based on realistic targeted reductions in national-level deforestation rates. These benefits are expected to arise from the project’s action-oriented elements, notably the implementation of use cases as well as support for landscape-level demonstrations. Tables 6 and 7 provide an indication of the ways in which use case implementation will support generation of GEBs and, more broadly, achievement of project outcomes such as: improved management of forest areas and

⁴⁸ Schmitt et al. 2009, FAO 2010, IUCN 2010

conservation of biodiversity; reforestation / afforestation; improved control of deforestation and monitoring / protection of carbon stocks, and; providing the information base for PES schemes.

- *Use case level:* Partly in order to enhance precision and reduce uncertainty as far as causality is concerned, the project will take advantage of its use case design to examine more closely GFW's impacts on specific forms and categories of management. Thus, for example, protected area use cases in both pilot countries are expected to have significant and measurable impacts on deforestation rates, primarily due to the enhanced ability to target enforcement. For each use case, national-level teams will develop hypotheses and design data gathering approaches to measure the impact of specific, information-based management interventions on deforestation, degradation, cost effectiveness, etc.
- *Demonstration landscape level:* The inclusion within each pilot country component of one geographically-defined demonstration landscape will provide a unique opportunity to focus on and monitor landscape-level impacts of a range of use case interventions.

Table 6: Outcomes, project elements and Global Environmental Benefits (GEBs)—Madagascar pilot

Outcome element	Use case, demonstration case and other project output-level contributions	Theory of changes leading to global environmental benefits
1. Improved management of existing forest areas and conservation of biodiversity	Use case 1. Protected Area Management	<ul style="list-style-type: none"> • Use of GFW to support enforcement reduces PA encroachment, deforestation/forest degradation, resulting in improved conservation of biodiversity and carbon sequestration/reduced land-use change based emissions • Use of GFW improves land-use planning, resulting in increased area under PAs
	Use case 2. Forest resource management transfer	<ul style="list-style-type: none"> • Increased monitoring of the lands that are transferred to local entities will lead to improved management of these lands, increased biodiversity, lower deforestation/forest degradation and increased carbon stocks/ reduced land-use change based emissions
	Use case 4. Mangroves	<ul style="list-style-type: none"> • Detailed mapping and increased monitoring of mangrove forests will lead to improved development plans that better protect mangroves. Additionally, regular monitoring will improve enforcement of mangrove clearing—leading to increased mangrove-based biodiversity.
	Use case 5. Mining	<ul style="list-style-type: none"> • Regular monitoring will improve enforcement of forest lands within and surrounding mining sites – leading to reduced deforestation/forest degradation and increased based biodiversity. • GFW will also be used to ensure that mining operations are compliant with their zero net loss of critical forest-based biodiversity habitat
	Use case 6. EIA monitoring	<ul style="list-style-type: none"> • GFW will allow for improved monitoring of EIA obligations for major development or investment projects, resulting in improved enforcement of forest habitat destruction and increased protection of associated biodiversity.
	Use case 7. Management of catchment areas and water resources	<ul style="list-style-type: none"> • GFW will support watershed management entities to carry out improved land-use planning and monitoring of forest use within the target catchment area – leading to reduced

Outcome element	Use case, demonstration case and other project output-level contributions	Theory of changes leading to global environmental benefits
		deforestation/forest degradation and increased protection of biodiversity
	Use case 8. Production forests	<ul style="list-style-type: none"> Improved monitoring of use of production forests will support increased law enforcement and reduced deforestation/forest degradation within these areas, leading to increased protection of associated biodiversity.
	Use case 9. Landscape planning	<ul style="list-style-type: none"> Support to landscape-based intersectoral land-use planning amongst relevant stakeholders will result in more optimized land-use allocation, from an economic, social and ecological perspective – leading to a decrease in critical biodiversity habitat being allocated to non-compatible ends (e.g. agriculture or infrastructure development)
2. Reforestation / afforestation programmes	Use case 9. Landscape planning	<ul style="list-style-type: none"> Support to landscape-based intersectoral land-use planning amongst relevant stakeholders will result in more optimized land-use allocation, from an economic, social and ecological perspective – including identification of lands that are suitable for reforestation/ afforestation (natural or assisted)
3. Improved control of deforestation on the ground and monitoring / protection of carbon stocks	Use case 1. Protected Area Management	<ul style="list-style-type: none"> Use of GFW to support PA enforcement reduces deforestation/forest degradation, resulting in improved carbon sequestration/reduced land-use change based emissions
	Use case 2. Forest resource management transfer	<ul style="list-style-type: none"> Increased monitoring of the lands that are transferred to local entities will lead to improved management of these lands, lower deforestation/forest degradation and increased carbon stocks/ reduced land-use change based emissions
	Use case 4. Mangroves	<ul style="list-style-type: none"> Regular monitoring will improve enforcement of mangrove clearing – leading to increased mangrove based biodiversity.
	Use case 6. EIA monitoring	<ul style="list-style-type: none"> GFW will allow for improved monitoring of EIA obligations for major development or investment projects, resulting in improved enforcement of deforestation/forest degradation and increased protection of associated carbon stocks.
	Use case 7. Management of catchment areas and water resources	<ul style="list-style-type: none"> GFW could support watershed management entities to carry out improved land-use planning and monitoring of forest use within the target catchment area – leading to reduced deforestation/forest degradation and increased carbon stocks
	Use case 8. Production forests	<ul style="list-style-type: none"> Improved monitoring of use of production forests will support increased law enforcement and reduced deforestation/forest degradation within these areas, leading to increased carbon stocks.
	Use case 9. Landscape planning	<ul style="list-style-type: none"> Support to landscape-based intersectoral land-use planning amongst relevant stakeholders will

Outcome element	Use case, demonstration case and other project output-level contributions	Theory of changes leading to global environmental benefits
		result in more optimized land-use allocation, from an economic, social and ecological perspective – leading to a decrease in high carbon lands being allocated to uses that would result in land-use change emissions (e.g. agriculture or infrastructure development)
4. Providing the information base for Payment for Ecosystem Services (PES) schemes	Use case 3. REDD+ projects	<ul style="list-style-type: none"> Contribute to setting forest cover and forest biomass reference levels by ecoregion Contribute to putting in place a standardized system for monitoring above-ground biomass emissions

Table 7: Outcomes, project elements and Global Environmental Benefits (GEBs)—Georgia pilot

Outcome element	Use case, demonstration case and other project output-level contributions	Global environmental benefits resulting
1. Improved management of existing forest areas and conservation of biodiversity	Use case 1: Management of production areas	<ul style="list-style-type: none"> GFW provides the possibility to assess damage trees and gain more control over the amount of trees taken out of the production area. This will ensure better control and therefore a denser remaining forest cover, leaving corridors intact and thus lower impact on biodiversity and lower GHG emissions Better management of logging areas will ensure that production areas will be less degraded when a company is finished in this area.
	Use case 2: Forest fire alert systems	<ul style="list-style-type: none"> GFW detects fires in less than five hours. The early detection of forest fires improves the ability to stop fires early and thereby reduce damage to ecosystems and biodiversity and lower GHG emissions
	Use case 3: Forest assessment, inventory and monitoring	<ul style="list-style-type: none"> GFW gives the possibility to identify, map and follow through time (monitor) the change of different types of forest (intact, secondary, planted, degraded), and thus gives the possibility to develop more specific plans for biodiversity conservation. Carbon sequestration and GHG emissions can be more easily calculated and plans to improve sequestration can be developed
	Use case 4: Protected area management	<ul style="list-style-type: none"> GFW gives the possibility to identify illegal clearing and logging in protected area can stop degradation and will have less impact in biodiversity To identify illegal clearing and logging in protected area can stop degradation and will have less GHG impact To identify different types of forest an overview of the threats can be categorized and plans be developed to manage forests in such a way to mitigate threats
	Use case 5: Forest carbon analysis and management	<ul style="list-style-type: none"> GFW gives the possibility to assess different forest types a much more accurate carbon analysis can be developed. Forest can then be managed in such a way to promote the dense carbon types

Outcome element	Use case, demonstration case and other project output-level contributions	Global environmental benefits resulting
2. Reforestation / afforestation programmes	Use case 2: Forest fire alert systems	<ul style="list-style-type: none"> Young trees are very susceptible to fires. Early detection of fires is important to stop fires as early as possible before new plantings are destroyed
	Use case 3: Forest assessment, inventory and monitoring	<ul style="list-style-type: none"> Support to accurate baseline forest inventory will help to monitor progress and quantify benefits (ecosystems, carbon and biodiversity)
	Use case 5: Forest carbon analysis and management	<ul style="list-style-type: none"> Supports restoration as a potentially legitimate and measurable REDD+ activity, with potential to spark a sequestering carbon boom related to restoration.
	Use case 6: Reforestation	<ul style="list-style-type: none"> To detect degraded lands and set up restoration programs, biodiversity corridors is a major component to restore biodiversity and sequester carbon
3. Improved control of deforestation on the ground and monitoring / protection of carbon stocks	Use case 1: Management of Production area	<ul style="list-style-type: none"> The detection of excess deforestation can trigger develop plan (law enforcement) to mitigate the impacts of GHG emissions, degradation and biodiversity The assessment of excess of deforestation is the start of reviewing permits and making better standards to have less impact on carbon and biodiversity
	Use case 2: Forest fire alert systems	<ul style="list-style-type: none"> Assessment of impacts of fires is first step to assess impacts on biodiversity and carbon
	Use case 3: Forest assessment, inventory and monitoring	<ul style="list-style-type: none"> GFW gives the possibility to have more control over all forest resources in the country and thus better plan inventories, and assessments on a national scale and develop better land use plans for biodiversity conservation and carbon sequestration.
	Use case 6: Reforestation	<ul style="list-style-type: none"> GFW gives an overview of resources and by monitoring and assessing restoration can contribute significantly to improve biodiversity and mitigate carbon sequestration
4. Providing the information base for Payment for Ecosystem Services (PES) schemes	Use case 1: Management of production areas	<ul style="list-style-type: none"> GFW will enable quantification of deforestation and the impacts of better management on deforestation and therefore can quantify ecosystem service on biodiversity and carbon. By measurable services these services can be monetized.
	Use case 3: Forest assessment, inventory and monitoring	<ul style="list-style-type: none"> GFW can quantify the different forest types and the impact they make on ecosystem services especially carbon and biodiversity,
	Use case 4: Protected area management	<ul style="list-style-type: none"> By quantifying the impact protection has on the deforestation scale, the ecosystem services can be quantified
	Use case 5: Forest carbon analysis and management	<ul style="list-style-type: none"> GFW can quantify the carbon in different forest types to be able to get payments for these carbon services
	Use case 6: Reforestation	<ul style="list-style-type: none"> New research shows that restoration can be a major contributor to improved biodiversity and sequestration of carbon; quantifying restoration has potential to be a major source of payments for ecosystem services

In estimating all of the above, the project will aim to gain a better understanding of the impact of varying levels of technical support on uptake by, and resulting impact within, individual countries.

Overall, the project will generate the following global environmental benefits in the pilot countries:

- enhancing the conservation and sustainable use of a wide range of globally important species and habitats, and particularly of all forest habitats in each country. The project will therefore support the improved conservation and management of approximately **15.4 million ha of forest habitats**⁴⁹ only in the pilot countries.
- contributing to the enhanced management effectiveness of **97 protected areas** in the pilot countries, **covering a total of 2.3 million ha**.
- supporting the enhanced conservation of natural habitat for over **15,000 species** in the two pilot countries alone, including many that are on the IUCN red lists and at various levels of extinction or endangerment risk (especially in Madagascar).

Estimated greenhouse gas emissions reductions resulting from uptake of GFW only in target countries, indicate projected reductions of **9,497,101** tons CO₂e over the project's direct lifetime (see **Table 8** below). As noted above, these estimates will be continuously refined and updated as part of the projects' M&E efforts and in line with enhanced GFW capabilities.

Table 8: Projected carbon benefits due to the project (tons of CO₂ equivalent / ha), 20-year period

Pilot Country	Direct lifetime		Indirect lifetime		Totals
	Conservation & enhancement of carbon in forests	Avoided deforestation and forest degradation (t CO ₂ e / ha) ²	Conservation & enhancement of carbon in forests	Avoided deforestation and forest degradation (t CO ₂ e / ha) ²	
Georgia	0	40,218 ^a / 142 ^b	0	0	40,218 ^a / 142 ^b
Madagascar	0	9,456,883 ^c / 60,144 ^d	0	0	9,456,883 ^c / 60,144 ^d
Total	0	9,497,101/ 60,286	0	0	9,497,101/ 60,286

^a Assuming a 1% yr⁻¹ reduction in gross carbon loss from aboveground biomass against a historical baseline emissions estimate of 201,092 t CO₂e yr⁻¹ over the time period 2001-2012. [Data sources: Hansen 2013 (deforestation), FAO FRA 2010 country table (biomass carbon stock in Georgia = 77 t C/ha)].

^b Assuming a 1% yr⁻¹ reduction in gross tree cover loss against a historical baseline estimate of 712 ha yr⁻¹ over the time period 2001-2012 [Data source: Hansen 2013]

^c Assuming a 1% yr⁻¹ reduction in gross tree cover loss against a statistically significant increasing trend over the baseline time period 2001-2013 [Data sources: Hansen 2013]. **See Figure 1 below.**

^d Assuming a 1% yr⁻¹ reduction in gross carbon loss from aboveground biomass against a historical baseline emissions estimate of 45 million t CO₂e yr⁻¹ over the time period 2001-2012 [Data sources: Hansen 2013 (deforestation), Woods Hole Research Center (carbon stocks)]. **See Figure 1 below.**

⁴⁹ Sources: country NBSAPs of Madagascar and Georgia.

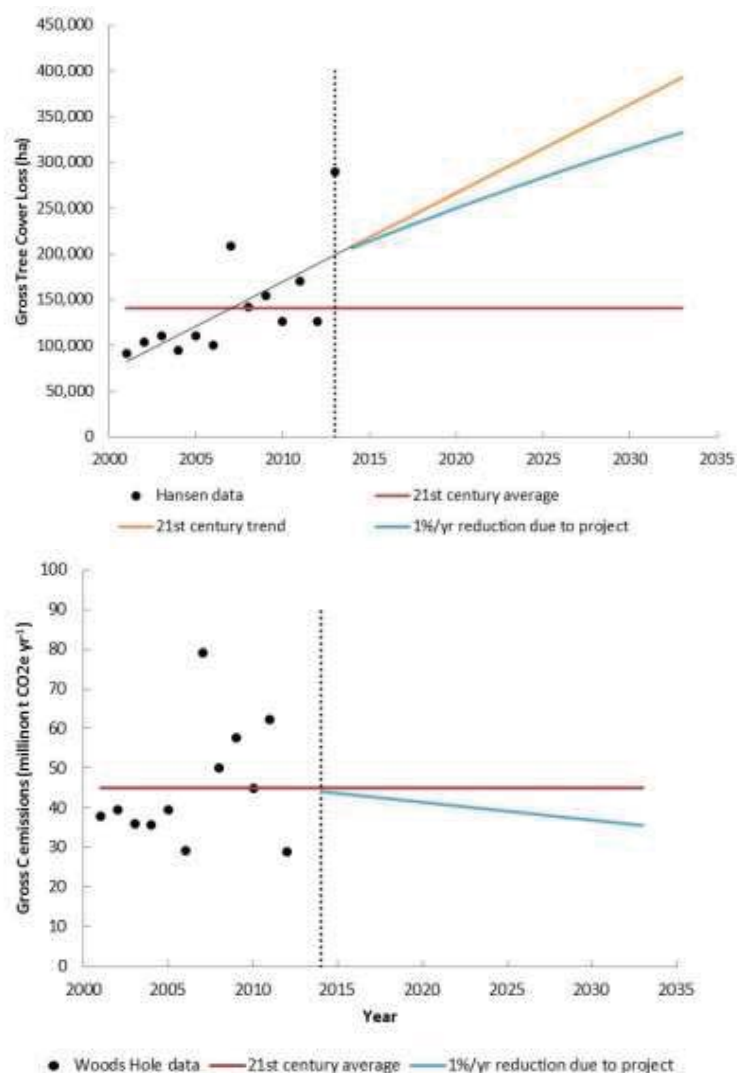


Figure 1. Projected reductions in deforestation rates (top figure) and carbon emissions from deforestation (bottom figure) in Madagascar resulting from project activities. In both cases, the red line indicates the 21st century historical trend and the blue line indicates a change from business-as-usual as a result of the project. Historical data points reflect observations derived from remote sensing imagery.

All of the above benefits will be measured, to a greater or lesser extent, by GFW itself. The accuracy of such measurements will be greatly enhanced both by changes to the system itself—including sharply improved carbon measurement capacities—as well as by the many national-level enhancements being incorporated through project support. Demonstration of this capacity and its potential replication value for monitoring of other projects—particularly GEF projects—will be a major added benefit. More generally, lessons learned from in-depth engagement in the pilot countries will be shared globally through the GFW networks and partnership multiplying the actual impact of the GEF investment and the total global environmental benefits generated.

3.2 Project goal and objective

The overall goal of the GFW effort—to which the GEF project will contribute—is to reduce deforestation and improve rural livelihoods by transforming forest management and conservation at a global scale. The project objective is to empower decision-makers in government, the private sector, and civil society with technology and information necessary to reduce deforestation and land

degradation, combat illegal activities, and conserve biodiversity in pilot countries and on a global scale.

The project operates at two distinct, but inter-connected geographic levels, namely global and national. Global-level activities are distributed across each of the project's four components, while national-level, or pilot country, support to Georgia and Madagascar is concentrated within Component 1.

At the pilot country level, GEF support will enable “deep dive” partnerships to achieve sustained impact, including through long-term partnerships with government agencies, civil society and the private sector. Forest stakeholders, including governmental officers, civil society, donors and buyers of commodities, in the pilot countries will acquire capacity and gain easy access to near-real-time and reliable data to support their forest conservation, sustainable forest management, REDD+ efforts and risk management.

3.3 Project components and expected results

The project will support GFW through the 4 components described below.

Component 1. Application and enhancement of GFW globally and in pilot countries⁵⁰

Global and country-level efforts under this component are expected to be mutually supportive and cross-fertilizing in nature. Global outputs (see 1.1.1 and 1.1.2 below) are being generously co-financed by various bilateral and private sector partners. Pilot country outputs (see 1.1.3 – 1.1.5 and 1.2.1 below) are co-financed by various country-level NGO and donor activities.

Outcome 1.1 GFW is upgraded and applied on a global scale and in 2 pilot countries Madagascar and Georgia, supporting: (a) improved management of existing forest areas and conservation of biodiversity, (b) reforestation/ afforestation programmes, (c) improved control of deforestation on the ground and monitoring / protection of carbon stocks and (d) providing the information base for PES schemes (Payment for Ecosystem Services).

Output 1.1.1 Improved global- and regional-level data on GFW platform.

The GFW system was launched in early 2014. As shown in **Table 3** above, the system is already bringing together an unprecedented range and breadth of forest-related data and information within one easily accessible platform. However, in line with ever-advancing technology, new opportunities are constantly emerging to make the system more precise and useful. GEF support, together with co-financing from multiple partners, will contribute to the improvement of global- and regional-level data layers on the platform. Key areas for improved data coverage and quality include deforestation monitoring; forest cover and forest type; land use, including concessions, plantation and infrastructure; carbon; community lands, resource rights and conflict, and; biodiversity / species data. Specific technical upgrades underway or in the pipeline include:

- Terra-i pan-tropical expansion of land cover change alerts system (originally developed for Latin America), with first version ready in 2015,
- Increased resolution of FORMA alerts from 500 to 250 m for pan tropics,
- Annual (2013-2016) updates of global tree cover change from UMD,

⁵⁰ This component was described in the PIF as “Application and enhancement of GFW 2.0 in pilot countries.” However, the expected outcomes and outputs referred both to global, as well as pilot country application and enhancement. The wording of the component has been revised to take this into account, as well as dropping the “2.0” from GFW. This action has in no way affected the pilot country financial allocations, which remain as per Table D. of the PIF.

- Thirty meter Landsat alert system from UMD,
- Targeted use of high resolution satellite imagery (sub 10 m) based on hotspot identification supported by medium-resolution systems,
- Addition of new global data sets, e.g. plantations, carbon.

The project—including both GEF-financed and co-financed elements—will support the strengthening of the GFW technology and enhanced accuracy of the system. In particular, GFW partners are committed to a continuous process to verify and improve systems for detecting tree cover loss and gain. At the global level, GFW partners will continue exploring **multiple approaches to improve the accuracy and precision of global forest monitoring systems**:

- Global validation studies of all tree cover loss products using higher resolution imagery (2015)
- Continued enhancements to existing algorithms based on validation results (ongoing)
- Pursuit of additional datasets that can be combined with the UMD data to provide context about tree cover type, e.g. data layers showing locations of primary forests versus tree plantations (ongoing)
- Exploration of new sources of remote sensing data (Sentinel-2, SkyBox, Digital Globe, etc.) and new computational methods (e.g. artificial intelligence) to create the next generation of change detection algorithms (five year timeframe)

In order to build local ownership and trust in these data products, it is also **critical for independent validation to be carried out nationally by local stakeholders**. This project will support the Governments of Georgia and Madagascar to conduct independent validation of the global tree cover loss products in their countries. They will also be empowered to customize global algorithms to create a more accurate national product. Furthermore, the project will enable Georgia and Madagascar to conduct policy-relevant analyses using the global tree cover loss data in combination with their own local data. For example, a researcher from the Ministry of Forestry in Indonesia recently combined UMD tree cover loss data with Indonesian primary forest data to estimate annual loss of primary forest starting in 2000.

Output 1.1.2 Improved features and functionality on GFW global platform to support analysis, decision-making and action

Of critical importance in determining GFW's utility is its global user interface and associated features through which users interact with the voluminous data developed and improved under output 1.1.1. For example, easy-to-use, free-of-charge, online "near-real-time" alert and monitoring systems are essential to support: increased rapid response capacity of forestry law enforcement and PA management agencies; increased cost-effectiveness of law enforcement activities on the ground; more effective advocacy, linked to increased accessibility of information for all stakeholders; increased accountability, linked to more transparent performance monitoring. All of the above contribute to improved control of deforestation on the ground and better monitoring/protection of carbon stocks.

Key tools planned or under development in order to make GFW data even more accessible and actionable to users worldwide include the following:

- Improvement and/or addition of new analytical tools allowing users to interpret data on-the-fly to support decision-making,
- Enhancement of user interface to make data more discoverable, understandable, and immediately relevant for multiple audiences,
- New tools for crowdsourcing and user participation, including submission of ground-based information,
- Optimization of the website and related apps for mobile phones

- New options for offline access to GFW data and analytical tools

Output 1.1.3 Nationally validated data sets, including refined forest cover / change data and additional locally generated data layers, are available within pilot country sections of GFW

This output will operate at the level of the two pilot countries—Georgia and Madagascar—with the aim of ensuring that GFW contains a highly accurate, widely accepted and comprehensive collection of data layers for enhanced forest management. The process will be enabled by the incorporation of country-level views and associated tabs within the GFW site (see Output 2.1.1 below).

A globally enhanced GFW (see Outputs 1.1.1 and 1.1.2 above) will represent a significant and extremely useful tool for forest monitoring and associated analytics. Given the global nature of the algorithms utilized, however, it is inevitable that certain inaccuracies will persist. Such inaccuracies become particularly important to address at country level, where ecological factor such as forest type differences may require specific corrections. An important early step in pilot country work will therefore be to use validation and ground truthing methods, including the creation of ‘accuracy tables’ to identify errors and to ensure that GFW reporting of tree cover change and deforestation is as accurate as possible. This will be done in close co-operation with national-level universities and other experts in order to help build capacities and to enhance national-level ownership of the resulting data sets and information flows.

In order for individual countries to take full advantage of the GFW platform, it will also be essential to integrate additional data sets that currently are in most cases available only at national and sub-national levels. As discussed in the baseline section above, such data are often dispersed amongst multiple stakeholders, many of which may have conflicting versions of the on-the-ground situation. These discrepancies can also include overlaps regarding land uses, e.g. geographic areas to which different governmental bodies may have awarded multiple leases / concessions. In other cases, information regarding lease or concession boundaries may simply be difficult to obtain, particularly in a form which allows geo-spatial analysis by non-experts. Finally, there may be cases where additional or supplementary data collection is required.

Under this output, existing data sets will be obtained, reviewed, validated, formatted and uploaded to the GFW system. As just one example, in Georgia, a forest cover map, based on RapidEye 2011 imagery, which is currently under preparation with GIZ support, will be uploaded to GFW. A number of other such datasets have been identified during the PPG (see **Annexes 17 and 18**); however, this number is expected to increase as additional data sets are brought forward. Through a nationally-agreed process in each country, data sets will be reviewed, confidence levels established and data made publicly available on the site. The process of building up an online atlas / geo-portal will be guided by the following principles and objectives:

- enhancing the site’s usability and analytical utility in consider a wide range of questions, such as: in what protected areas has deforestation been greatest?; where do mining concessions overlap with primary forest?; what administrative units are particularly subject to deforestation and degradation?;
- supporting specific priority areas of forest and land use management, e.g. management of production forests, protected areas management, etc.;
- helping to make performance monitoring and enforcement measures more targeted and thus more cost effective;
- enhancing national-level ownership of the system.

Table 7 below presents a preliminary analysis conducted for Madagascar, which is helping to identify and characterize data layers which may be incorporated into national “forest geoplatforms” in order to

underpin specific areas of management being addressed under Output 1.1.4.⁵¹ In the case of Georgia, GFW will assist in developing (or contribute to, in case another geo-portal has already gained traction in the meantime) a Georgia specific website, or geoportal, with automated data sharing with the global GFW-Georgia country page (also to be developed). GEF funding will support the development of the website, data development and automated data sharing. After co-developing the national website, a Georgian entity will be responsible for running this national website, updating, funding and adding specific Georgian datasets based on the principles of transparent open data.

Finally, even given expected improvements in the resolution of data being used by GFW at global level, combined with the above-mentioned national data sets, it is expected that higher resolution data may still be useful for certain purposes. Indeed, both Georgia and Madagascar are not ‘classic’ cases of large-scale deforestation easily captured by a system like GFW. For this reason, higher resolution data (up to 5 meters) will be acquired for portions of each country and incorporated into the GFW website. This data will be useful in validating forest cover change implied by lower resolution data, as well as serving to highlight change in areas which may or may not be captured at 30 m. resolution, e.g. dry forests in Western Madagascar.

Output 1.1.4 Enhanced management practices through national and field-level application ('use cases') of data and information generated and made available through national GFW views

In developing GFW, partners have remained mindful of the fact that data, information and analysis can only go so far and that, at some point, there is a need to turn information into action. This output reflects that conclusion and is focused on demonstrating ways in which the information being captured and shared by the GFW system may be used to address specific forest management challenges in the pilot countries and thereby achieve measurable global and national benefits.

A number of so-called ‘use cases’ have been developed for each country. Each use case reflects a category of forest management or a land-use type which could benefit from better data, information and analysis. Use cases have been developed in close consultation with relevant management authorities in each country. Priority data needs (see Output 1.1.3, including **Table 9**), have been defined in large part based on their relevance to the selected set of use cases. For example, a protected area use case—considered important to address deforestation and forest degradation within PAs—clearly depends on accurate integration of protected area boundaries within GFW, etc. As a result, data layers containing such information are considered a priority for the system.

A key aspect of each use case will be a detailed examination of the process by which information flows under each of the management areas under consideration. Intervention strategies will be crafted based on identified ways of strengthening such information flows and ensuring that knowledge is transformed into enhanced and more targeted enforcement and other actions.

As described in Section IV below under Implementation Arrangements, each use case is designed to operate relatively independently, with the lead being taken by a key governmental or non-

⁵¹ **Annexes 17 and 18** present additional technical details for Georgia and Madagascar.

Table 9: Data layers and use cases in Madagascar

	GLOBAL FOREST WATCH		Status of Data	Data Relevant to Use Cases							
				Protected Areas Management	Community Managed Areas	REDD+	Mangroves	Mines	EIA	Watershed and Water Resources Management	Production Forests
Global Forest Watch Data Layers											
Forest Change											
UMD Tree Cover Loss/Gain			1	X	X	X		X	X	X	X
FORMA Alerts			1	X	X	X		X	X	X	X
QUICC Alerts			1	X	X	X		X	X	X	X
NASA Active Fires			1	X	X	X		X	X	X	X
Forest Cover											
Tree Cover Extent			1	X	X	X	X	X	X	X	X
Tropical Forest Carbon Stocks			1	X	X	X	X	X	X		X
Intact Forest Landscapes			1	X	X	X	X	X	X	X	X
Forest Use											
Logging			3					X	X	X	X
Mining			3					X	X	X	X
Oil Palm			3					X	X	X	X
Wood Fiber Plantations			3					X	X	X	X
Conservation											
Protected Areas			2	X	X	X	X	X	X	X	X
Biodiversity Hotspots			2	X	X	X	X	X	X	X	X
People											
Land Rights			3	X	X	X	X			X	
Resource Rights			3	X	X	X	X			X	
Stories											
User Stories			1	X	X	X	X	X	X	X	X
Mongabay Stories			1	X	X	X	X	X	X	X	X
Data not on GFW											
Environmental and Conservation Data											
Biomass volume			4	X	X	X	X	X	X	X	X
Carbon storage (not on GFW)			2	X	X	X	X	X	X	X	X
Carbon Credit and PES Projects			4	X	X	X	X				
EIA Results			4					X	X	X	
Forest cover/change (not on GFW)			2	X	X	X	X	X	X	X	X
Mangroves			4	X	X	X	X		X	X	
Rainfall data			4	X					X	X	
Soils			4	X	X	X			X	X	X
Water quality			5	X	X		X	X	X	X	
Watershed boundaries			5	X	X		X	X	X	X	X
Land, water, and resource use											
Fisheries			4	X	X	X	X		X	X	
Land clearing			4	X	X	X	X	X	X	X	X
Non-timber forest products			5	X	X	X	X				X
Administrative and Socioecomic Data											
Demographic data			5	X	X	X	X	X	X	X	X
Infrastructure			5		X			X	X	X	
Local level administrative boundaries			5	X	X	X	X	X	X	X	X

1 = Data layer available on GFW, including data for Madagascar

2 = Data layer available on GFW, including data for Madagascar; data for Madagascar also available elsewhere

3 = Data layer available on GFW but not data for Madagascar; Madagascar data available elsewhere

4 = Data layer not available on GFW but data for Madagascar is available elsewhere

5 = Data layer not available on GFW and availability of data for Madagascar is unclear

X = Data layer is relevant to use case

Blank cells indicate that the data layer is not relevant to the use case

Table 10: Initial set of agreed use cases, by country

Country	Use case	Main activities for GFW-based support
Georgia	Management of production forests	<ul style="list-style-type: none"> • Functional categorization / zoning of forests • Monitoring & assessment of leased areas • Surveillance of license conditions • Public information and participation
	Forest fire alert systems	<ul style="list-style-type: none"> • Information for analysis and prevention • Early detection • Inter-Agency Coordination
	Forest assessment, inventory and monitoring	<ul style="list-style-type: none"> • Forest monitoring/assessment • <i>Expertise/methodologies in data interpretation and analysis</i> • <i>Interagency data sharing/public access to information</i>
	Protected area management	<ul style="list-style-type: none"> • Defining protected area borders • Forest monitoring/assessment within the protected areas • Monitoring of adjacent areas • Identifying potential protected areas
	Forest carbon analysis and management	<ul style="list-style-type: none"> • Accurate, updated data on forest annual increment of timber, which is necessary to assess changes in forest and other woody biomass stocks
	Reforestation	<ul style="list-style-type: none"> • Satellite observation of forest change dynamics, forest degradation and natural restoration of degraded areas over time • Provide data on occurred fires, natural disasters and land degradation
Madagascar	Protected area management	<ul style="list-style-type: none"> • Update of the information on protected areas (existing data) • Monitoring – evaluation of forest in the protected areas • Forest surveillance of protected areas • Plan potential protected areas and develop land use scenarios
	Forest resource management transfer	<ul style="list-style-type: none"> • Boundary of the TGRF zones • Planning of TGRF zones, land use scenarios, protected areas and boundaries of potential REDD+ and biodiversity projects • Monitoring-evaluation of forests in the TGRF zones • Surveillance of adjacent zones • Forest reconversion • Management targets and indicators of impacts
	REDD+ projects	<ul style="list-style-type: none"> • Contribute to creating a technical committee • Provide support to the creation of reference levels of ecoregions
	Mangroves	<ul style="list-style-type: none"> • Play an essential role in prioritizing the intervention in the field of the dry forest of the west • Contribute to drafting the mangroves development plans
	Mining	<ul style="list-style-type: none"> • Evaluation and forest surveillance • Monitoring and evaluation of concession zones • Planning of the surveillance • Public information and participation • Planning of the biodiversity management
	EIA monitoring	<ul style="list-style-type: none"> • Monitoring of the enforcement of the PGEP • Monitoring of the enforcement of the PREE • Monitoring of the PGEES • Monitoring system of integrated impacts: social, economic and ecological
	Watershed management	<ul style="list-style-type: none"> • Providing information on soil erosion and the states of water • Monitoring the changes of land use • Conducting environmental impact assessment for large scale agricultural developments • Evaluating soils and waters under different types of use • Monitoring of water quality • Providing data on the evolution of forest cover in hydro agricultural and hydro electrical catchment areas
	Production forests	<ul style="list-style-type: none"> • Monitoring – evaluation of the forests in the KoloAla sites • Surveillance of adjacent zones • Plan for potential KoloAla sites and develop land use scenarios.

governmental stakeholder, working in consultation with other affected parties within a “Use Case Implementation Group”. These groups will also advise on issues related to data collection and integration within the national forest geoportal.

An initial set of agreed use cases developed during the PPG for each pilot country are presented in **Annexes 17** and **18** and are summarized in **Table 10** above. Use case descriptions are subject to revision and finalization by the respective use case implementation groups. In addition, a process will be established within each pilot country (see Section IV, Implementation Arrangements) whereby new use cases may be developed and approved on a competitive basis.

Use cases will represent important entry points for participation by local communities, civil society and gender-based organizations. Each use case group will be asked to identify key gender and socio-economic factors associated with the use case, together with actions to promote participation, including enhancement of grassroots involvement and crowd-sourced data gathering. Based on preliminary use case design (see Table 8 above and Appendices 17 and 18), opportunities for more extensive participation will be significant in use cases involving protected area management and reforestation in Georgia and those involving protected area management, forest resource management transfer, REDD+ and mangroves in Madagascar.

Output 1.1.5 Targeted awareness, capacity building and outreach effort focusing on governmental and non-governmental stakeholders in the pilot countries to support timely and wide-ranging system uptake

Consultations undertaken during the PPG have represented the first key steps in raising national-level awareness in pilot countries about the potential uses of GFW. This process will be broadened as well as deepened during the first year of project implementation. A series of national and local-level workshops will introduce key stakeholders to GFW and further assess analytic needs. Next, a targeted program of institutional and human capacity building will be undertaken. Outreach, awareness raising and participation efforts will aim to reach, among others, local people in forest-dependent communities. Outreach to such groups will be made easier by plugging into existing governmental and NGO networks and community groups. This effort will be closely linked to, and designed to support, the specific use cases identified and supported under 1.1.4.

A key objective under this output will be to increase participation in, and contributions to, GFW. This will be further enabled by enhanced GFW upload features, as well as crowdsourcing and the development of mobile and offline apps (see Output 1.2 above).

Finally, collaboration with universities, schools, NGOs, donors and media will serve to increase knowledge about forests and to support national-level efforts to generate and publish value-added, GFW-based analyses.

Outcome 1.2 Government and non-government agencies in pilot countries adopt GFW as a critical information tool for collaborating on landscape-level, multi-sectoral initiatives

Output 1.2.1 GFW demonstrated as a tool for integrating multiple biodiversity, carbon and land degradation considerations in support of landscape-level planning and management

In each pilot country, the project will demonstrate the use of GFW as a shared and publicly available forest and land management tool to support the development and implementation of collaborative, cross-sectoral integrated land use management strategies at sub-national, landscape levels. Pilot landscapes selected for this purpose are Adjara Autonomous Region in Georgia and Boeny in northwestern Madagascar. These areas are further described in the national reports (see **Annexes 17** and **18**).

GFW will be introduced as a management and decision making tool to support the joint development of innovative policies that integrate the perspectives of different forest uses, such as forest products, tourism, agriculture, watershed and water resources management, energy generation, and community use.

Specific activities will include the preparation of specific GFW-based analyses—including those based on higher-resolution data as needed—concerning the pilot landscape. Particular emphasis will be placed on integration and mainstreaming of geo-spatial data related to biodiversity, forest carbon and land

degradation. These will build on and extend the results of national-level use cases supported under Output 1.1.4, while incorporating new themes as appropriate.

By combining GFW analyses from multiple use case areas—e.g. production forest management, fire alerts, forest assessment, PA management, carbon and reforestation, etc.—integrated landscape-level forest and land use management strategies can be developed.

Component 2. System uptake and replication

This component will complement efforts under Component 1 by supporting national-level uptake of the GFW system—including replication of demonstrated GFW-based approaches to forest and land use management challenges—in additional countries around the world.⁵² This process will depend, first, on global and national-level enhancements to GFW that will help to tailor the system for national-level users (see 2.1.1 below). These enhancements will underpin efforts to stimulate national-level uptake both in the pilot countries (see Component 1 above), as well as in a broader set of target countries (see 2.2.1 below). Pulling these efforts together, Output 2.2.2 will support lesson learning through regional- and thematic-level analyses of experience gained in pilot and target countries. Finally, the full range of policy lessons learned at local, national and global levels will be communicated to a global audience in the form of policy guidelines under Output 2.2.3.

Outcome 2.1: National-level users in multiple countries have enhanced opportunity to visualize and utilize country-specific data

Output 2.1.1 Enhanced online GFW system to visualise and enable interpretation of country-relevant data

To allow GFW to function as a forest geoplatform for specific countries—or as an element thereof—the global platform will need to be enhanced in various ways when ‘zoomed in’ to national level. Once these changes have been made at global level, national-level views will remain relatively consistent across country, but will inevitably need to diverge somewhat depending on available datasets, language, etc. Overall, the following kinds of enhancements will be made to improve national-level uses and analyses:

- Improved interfaces to access and view national data sets, e.g. land cover, land use, forest type,
- Upgraded country pages developed in collaboration with FAO and coinciding with the launch of the Global Forest Resources Assessment 2015,
- Ongoing user surveys and feedback analyzed to inform interface improvements and web development priorities,
- Structured user testing of new features and functionalities to enable development,
- Improved web-based translation systems, user manuals in multiple languages and additional language-related options,
- Tailored GFW apps developed to address monitoring needs related to key international policy commitments, e.g. monitoring national progress towards CBD Aichi targets, setting reference levels for REDD+, etc.
- Online training materials, such as sample analyses, examples and webinars.

Outcome 2.2 Lessons learned and experience gained in target countries support the enhancement of the GFW platform to increase its relevance and utilization at scale by a range of stakeholders

GFW is pursuing pilot activities and partnerships in over a dozen countries worldwide, including Mexico, Colombia, Peru, Brazil, and Liberia, six countries in Central Africa, Indonesia, Cambodia, Myanmar,

⁵² GEF support will specifically enable uptake by GEF beneficiary countries.

Canada, and Russia. GEF financing is enabling GFW to add Madagascar and Georgia to this growing list, each of them representing a distinct forested ecosystem and socio-economic context not present in the other GFW pilot countries. While Madagascar is unique in many ways, lessons learned from piloting GFW here will inform improved application of methods, tools and approaches from Southern Africa to Australia. GFW's application in Georgia will likewise inform improved methods, datasets and approaches for the Caucasus countries, Turkey, etc. Otherwise, the rather distinct socio-economic and ecological circumstances facing these countries in this sense add to the incremental logic supporting their inclusion.

Through these national engagements and partnerships, the project aims to:

- Better understand country needs in order to enhance GFW's growing suite of data and tools and to ensure that these are highly relevant and practical for national-level use.
- Identify replicable and scalable "use cases" related to the application of GFW data and tools. The extent to which these use cases will be generalizable will depend on the nature of the use case itself, as well as the degree to which various countries share similar ecological and socio-economic contexts.
- Raise the global bar concerning transparency and data disclosure by creating friendly competition between countries. We have seen this model work very successfully through our work to promote land use allocation transparency in Central Africa.

Output 2.2.1 Enhanced GFW uptake in target and other countries

GFW partners have identified a number of target countries for priority uptake support efforts. These include Indonesia, the Congo Basin, Liberia, Mexico, the Mekong Delta, Central America, Columbia and Myanmar. A number of these countries were visited during the PPG and have benefited from initial outreach efforts via workshops, etc. These efforts will be expanded during the full project and will involve both in-country efforts as well as country participation in sub-regional, regional- and thematic-level workshops, including lesson learning efforts supported under 2.2.2 below. It should be noted that the category of "target country" is expected to remain flexible, particularly given the importance of ensuring that support is fully demand driven; it is also not intended to exclude other countries which may have specific inquiries about GFW data and tools, requests for customized applications, etc.

Among other strategies for supporting national-level uptake, GFW will encourage the documentation of successful use cases in local newspapers, blogs, journals, etc.

Output 2.2.2 Country-level and thematic analyses and sharing of lessons learned through implementation of use cases and other country-level co-operation

A crucial element in ensuring the long-term efficacy and achieving the full potential, of GFW will be to understand in detail the ways in which the site is being used and helping to effect change within user countries. This also includes the degree to which such change is happening organically vs. is benefitting from active co-operation and mediation. Specific aims of the analysis will include the following:

- to deepen understanding of country needs so as to inform further development of the GFW platform;
- to better understand key information and knowledge gaps standing in the way of conservation and sustainable management, in order to help rally the GFW partnership to address these gaps;
- to better understand the role that transparent information can play in contributing to conservation and sustainable management, including any limitations and additional solutions that may be needed;
- to better understand key capacity gaps that are preventing the effective collection and use of critical information in countries, so that GFW partners can better prioritize and coordinate capacity building efforts.

In support of the above aims, careful analyses will be undertaken of GFW uptake within not only GEF

pilot countries (Georgia and Madagascar) but also within other countries where GFW uptake is being targeted (see 2.2.1 above). In addition to country studies, thematic, multi-country analyses will be prepared in order to assess the specific management contexts (protected areas management, community forest management, etc.) within which GFW is having impacts, as well as techniques for using GFW effectively to identify and address drivers of deforestation and forest degradation, strengthen governance, etc. Multi-country / thematic analyses will be based on collaboration among country-level experts within and across regions and forest types.

Through the above analyses, success stories, as well as persisting barriers, will be identified and shared at regional and thematic workshops, training courses and online. These events will also provide opportunities to introduce new countries to GFW. Importantly, lessons learned will also feedback iteratively into further enhancements to GFW, including tool development to address cross-cutting challenges, bottlenecks, and barriers to uptake.

Output 2.2.3 Policy and programme guidance based on GFW lessons learned

Based on analysis and lessons learned under Component 1 and Output 2.2.1, a set of policy guidelines for national governments—related to the use of remote sensing and associated data and information for enhanced forest and land use management—will be developed and widely disseminated to governments, CBD, UNFCCC, UNCCD, CSOs and the private sector. Additional policy papers will assess the utility of apps aiming to support countries in monitoring international commitments related to the CBD Aichi targets, REDD+, etc.

Component 3. Strengthening and sustaining the GFW partnership

Outcome 3.1 The GFW partnership is strengthened, long-term financial sustainability is secured, and GFW is increasingly regarded as a transparent and credible monitoring and management tool in support of forest conservation and sustainable use

Among the strengths of the GFW approach to date has been its ability to bring together a wide range of partners around a set of common, or at least complementary, interests. A wide range of partners has been encouraged to contribute knowledge and resources according to their respective areas of expertise and comparative advantage. The success of this partnership to date is undeniable, yet there remains the need to expand, to strengthen, and to ensure the sustainability of, the collaboration. To these ends, the project will support three outputs, as described below.

Output 3.1.1 Country-, regional- and global-level user networks established and strengthened

User networks being established in GEF pilot countries under Component 1 will provide lessons for the creation of analogous networks in additional target countries. International networking will be strengthened through support for regional and thematic workshops to exchange lessons learned (see Output 2.2.1 above).

Complementing the above, specific network-building efforts, including strengthening of the global partnership, will be supported under the present output as follows:

- supporting national- and local-level networks engaging governmental, academic, indigenous people's, women's and civil society representatives to stimulate and enhance the use of GFW for improved forest management.
- ensuring partner country level representation in the Partnership,
- development and maintenance of a user contact database,
- creation of an online discussion forum, user profiles and other social networking tools to enable communication, lesson sharing, and collaboration across national, regional and global user networks,
- recruitment of new GFW Partners,
- creation of MOUs and partnership agreements as necessary

- regular communications to the GFW Partnership (e.g. via email newsletters, the GFW Partner website, bilateral discussions), including updates on key activities and outcomes and soliciting input on key challenges,
- annual in-person meetings of the GFW Partners and Advisors, potentially including global and regional gatherings.

Output 3.1.2 Sustainable financing plan for the GFW system developed in collaboration with public and private sector as well as CSOs

Country-level work and analysis (see Output 2.2.1) will be important in demonstrating the essential cost effectiveness of the GFW approach, particularly its system of alerts and other methods of monitoring and targeted enforcement. This work will be complemented under the present output by careful review and identification of cost-effective approaches to system maintenance. Analysis of lessons learned will likewise feed back into understanding of what are the most and least cost-effective aspects of the system; these will also be taken into account as system enhancements are considered. Country-level and private sector financing of national and thematic components, e.g. GFW Commodities, will also be sought.

Based on all of the above factors, a sustainable financing plan will be developed in collaboration with public and private sector as well as CSOs. Key elements of the plan are expected to include the following:

- Assessment of cost-saving benefits of GFW for key user groups, enabled through low-cost access to data and tools and increased efficiency of operations;
- Assessment of opportunities to minimize costs associated with data and platform maintenance;
- Recruitment of additional private sector partners, especially from technology sectors, to provide in-kind contributions to reduce costs (e.g. free cloud computing services from Google);
- Ongoing monitoring, evaluation, and documentation of outcomes and success stories to share with existing and prospective funders and stakeholders;
- Enhancement of the GFW API and other open source tools (see Output 1.1.2) to allow GFW partners and users to build on the core platform to generate new apps and tools to address their own needs, thereby spreading development costs among a broader network of users

Output 3.1.3 External and independent review and oversight mechanism established to guarantee highest degree of transparency and technical credibility

The accuracy and credibility of GFW data are critical to its long-term success and utility. Mechanisms for external and independent review and oversight will be established to guarantee the highest degree of transparency and technical credibility. A global technical advisory committee will be established to ensure operational transparency and effective management, especially in regards to the latest remote sensing information, algorithms and needed computing power and long-term sustainability of the initiative. The Advisory Group will hold quarterly virtual meetings and will include experts and champions of the initiative. Technical committees (subsets of the GFW Advisory Group) will address specific technical challenges related to data and will be involved in the development of articles to scientific journals documenting methodologies for key GFW datasets. The Committee will also put forward open and regularly updated communications regarding known uncertainty levels and limitations related to specific data available via the GFW website. Finally, workshops will convene data scientists and relevant stakeholders to address questions and concerns about specific datasets and associated methodologies.

Component 4. Private sector application to reduce deforestation in key commodity sector supply chains

Outcome 4.1 National and global-level impacts of GFW on forest conservation are significantly enhanced through the adoption of the suite of tools/platforms as a supply chain management tool by the private sector

Given the critical role of some commodities (i.e. palm oil, soy, timber, pulp and paper, and beef) as drivers of deforestation, the GFW partnership has placed a good deal of emphasis on incorporating commodity-related datasets and tools into the system. Thus, as noted in the baseline section above, Global Forest Watch Commodities (GFW Commodities) was launched at the Roundtable for Sustainable Palm Oil (RSPO) European Summit in June 2014, with a suite of web tools for business users in BETA. These tools offer companies new ways to identify and address commodity-linked deforestation in their supply chains. For example, the initiative is shedding light on how individual oil palm concessions are affecting forests by surfacing datasets related to: (i) RSPO certified palm oil plantation areas; (ii) Southeast Asian peatlands, (iii) land cover in Southeast Asia, (iv) land cover in Indonesia, (v) global land cover and (vi) legal classifications of land in Indonesia. The initiative also develops decision-support tools for companies in the forest-risk commodity sectors, such as a risk assessment tool that enables a company to assess deforestation-related risk in its supply chain by comparing the performance of suppliers against a range of deforestation-related indicators.

While commodities such as palm oil, pulp/paper, soy and beef, combined, are responsible for the majority of commodity-driven deforestation globally, they are not significant drivers in either Georgia or Madagascar. At the national level in the two pilot countries, private sector engagement will be focused on the sectors that have the greatest impact on forests. In Madagascar, activities will focus on the timber and mining sectors (notably through use cases 2, 3, 5 and 8). In Georgia, activities will focus on the timber sector (notably through use cases 1, 3, and 5). In addition to working with the private sector to reduce commodity-related deforestation and forest degradation, GFW will work with actors at the national and global level to put in place methods and tools to ensure transparent and standardized reporting of forest carbon – reducing barriers to entry for both the supply and demand side in an eventual carbon market.

For the timber sector, GFW will focus on working closely with the private sector, government and civil society in Madagascar and Georgia to ensure that timber operations are in compliance with national and international market legality and sustainability requirements. This will be achieved by tailoring national GFW tools to incorporate monitoring and reporting against key indicators of legality and sustainability in the timber sector for each country – and linking this information in an easy-to-interpret format to the global market place. GFW will leverage timber trade policies such as FLEGT, the EU Timber Trade Regulation, the U.S. Lacey Act and the Australian Illegal Logging Prohibition Act, in order to incentivize compliance by actors in the two pilot countries.

Regarding mining, GFW will focus primarily in working closely with the private sector, government and civil society to ensure robust environmental impact assessments are carried out prior to the start of mineral extraction, as well as to monitor whether EIA obligations are being respected during mining operations. Via GFW, companies, government and civil society will be better able to monitor whether critical forests are being cleared, whether agreed upon biodiversity offsets are being respected and whether post-extraction ecosystem restoration has been satisfactorily carried out, to cite a few examples. As with the timber sector, GFW will not only allow for third parties to monitor the private sector and government, but will also provide the private sector a platform to showcase their performance and environmental stewardship to investors and consumers.

In order to maximize GFW's impact in reducing commodity-related deforestation, while simultaneously helping countries to achieve sustainable growth goals, the project will deliver the three outputs described below.

4.1.1 Partnerships with selected private sector companies active in target commodity sectors in pilot and other countries, to assess user needs and requirements and jointly explore the development of GFW-specific decision-support tools tailored to private sector operations, management systems, and covering various steps in commodity supply chains

The project will develop partnerships with selected companies and business associations—particularly those active in pilot countries—in order to gather knowledge about business needs, prioritize and jointly-develop GFW commodity-related tools, conduct user testing, and gather feedback on the utility of tools in supporting improved decision-making. Closely engaging eventual users in the design of the tools will help to maximize their utility and speed their uptake. The project will develop formal partnership agreements with select companies demonstrating high commitment to reducing impacts on forests and playing a major role in specific commodity supply chains. It will work closely with these partner companies to identify and prioritize goals, data and analytical needs, and critical data gaps for monitoring and reporting on supply chain sustainability. In addition, data-sharing partnerships will be developed to enable presentation of the highest quality and most comprehensive information available about commodity production and supply chain systems, e.g. standard approaches to, and platforms for, the development and disclosure of commodity production system and supply chain data, together with contextual information relevant for corporate decision-making.

4.1.2. An expanded and improved GFW Commodities application or suite of applications, providing enhanced datasets and management tools for companies trading in goods and services linked to deforestation

Based on knowledge gained and consensus built through the above partnerships, the project will develop and make accessible datasets and associated tools for use by commodity producers, commodity traders, consumer goods manufacturers, investors, and others needing to manage and/or monitor various commodity supply chains. Specific decision-support tools will be developed and tailored to user needs, learning from similar work elsewhere under the wider GFW partnership, and covering various steps in a range of commodity supply chains.

Key categories of information that may ultimately be made available through GFW Commodities include the following:

- Location and associated information for production areas, processing sites, ports, and other supply chain nodes relevant for linking deforestation activity with responsible parties in select commodity supply chains,
- Information about certified commodity production areas,
- Locations of areas of importance for conservation (e.g. High Conservation Value (HCV), High Carbon Stock (HCS) and others),
- Information about field assessments/audits and linkages to associated platforms,
- High-resolution imagery for priority areas,
- Land claims, community lands, and conflicts for targeted high-priority regions,
- Land management and incident response reports,
- Smallholder production areas.

Building on the above and other relevant data sets, the GFW Commodities application will be expanded to include various open-source, freely available web-based decision-support tools, such as:

- *Tools for supply chain companies* that: (i) monitor active issues related to the performance of suppliers; (ii) assess supply chain risks, at various supply chain nodes such as the mill or production site level; (iii) report performance results to stakeholders; and (iv) identify degraded areas potentially suitable for sustainable expansion of commodity production.

- *Tools for commodity standards systems* that: (i) monitor performance related to deforestation to improve enforcement and reduce associated cost; (ii) enhance the credibility of the standard relative to deforestation, and; (iii) support improved communication with commodity buyers and consumers.
- *Tools that enable people and companies* to contribute data and stories from the ground. Bottom-up information will provide a critical counterbalance to top-down information derived from satellites.
- *Tools that help NGOs and other stakeholders* to lobby governments, growers, traders, certification schemes, and other supply chain actors to publicly disclose key information about commodity production systems and supply chains.

User testing with companies will also be undertaken on a regular basis and feedback regularly incorporated into the tool development cycle to ensure the tools are user-friendly and relevant to the business user.

4.1.3 Broad, rapid uptake of GFW Commodities applications through partnership networks and specific promotion efforts

The project will pursue several complementary approaches to encouraging rapid uptake of GFW Commodity tools. First, GFW's emerging global partnerships with the Consumer Goods Forum, World Business Council for Sustainable Development, Tropical Forest Alliance 2020 (TFA2020), and several of the world's largest commodity companies (e.g. Unilever, Nestle, and Cargill) will greatly accelerate uptake by local subsidiaries, joint-venture partners, and suppliers of agricultural products linked with deforestation and forest degradation. Possible new partnership opportunities will be explored with other relevant initiatives and organizations such as the Forest Stewardship Council (FSC) and Forest Trends. Partnership with companies will enable integration of GFW information into their management systems, and encourage them to provide additional information (as WRI has piloted successfully with the Forest Transparency Initiative, supporting the FLEGT and EU Timber Regulation processes in Central Africa).

The project will also help to promote GFW Commodities within relevant private sector conventions and specific communication channels, including UNEP FI, the CFA Institute and the associations mentioned above. Participation in relevant multi-stakeholder and international fora will help to build consensus around, and commitment to, a vision for sustainable commodities production. In particular, research, analysis, and communication efforts aimed at such fora will help to make the case for sustainable commodity production to companies, to support priority-setting and strategic thinking and to underpin implementation of strategies, including evaluation of the costs/benefits and risks associated with deforestation in commodity production.

Finally, in coordination with priority country implementation plans, the project will engage with target country governments and other stakeholders, using GFW Commodities as a fulcrum around which to focus relevant discussions, to encourage those governments to:

- Clarify and make consistent policy related to commodity development,
- Develop the capacity necessary to implement policies effectively, at multiple scales,
- Improve enforcement and reduce associated cost,
- Gain access to the financial resources necessary to implement policies effectively,
- Effectively incorporate smallholders into sustainable production systems,
- Recognize the value of transparency and disclose information about commodity production systems and forests.

3.4 Intervention logic and key assumptions

The logic of GFW is based on the fundamental conclusion that an absence of timely, widely available and accurate forest data and information are a critical barrier to enhanced forest management in many countries around the world. By dramatically enhancing the transparency associated with actions that

cause forest change, GFW can make a critical difference in outcomes, including levels of deforestation and degradation.

The intervention, particularly its GEF-funded elements, further assumes that many developing countries in particular will face capacity and other constraints that may slow or even prevent effective use and uptake of the GFW system. GEF support enabling in depth support to the two pilot countries will explore and remove many such barriers. In addition, it will aim to learn lessons from pilot and target country experience in order further to enhance GFW's impact on management outcomes. Here, the intervention logic emphasises 'information to action', in this case transmitting enhanced country-level understanding into changes in management approaches, such as enhanced targeting of enforcement.

Pilot country interventions have been designed primarily to operate at national level, rather than focus on individual 'pilot sites'. This reflects the national 'economies of scale' associated with enhanced information management. Nevertheless, in order to obtain a more detailed understanding of how interventions within multiple management areas can combine synergistically, each pilot country does include a single demonstration landscape as well.

Finally, the project logic also depends on the following three priority assumptions:

1. Target users will **trust the data** and use the information provided by GFW.
2. GFW depends upon innovative use of **new technologies**.
3. Greater access to improved information will lead to positive impacts through **mobilization and actions** based on the information, which in turn will reduce rates of forest loss and degradation in priority countries and regions.

3.5 Risk analysis and risk management measures

Table 11: Risk management

Identified Risk and Level of risk likelihood/severity	Proposed risk management measures
1. Complex coordination arrangements at the global scale and country level Level: L	This risk may negatively affect timely and effective implementation and will be mainly addressed by building upon the strengths of the established WRI and UNEP networks, using the existing GFW consultative and information sharing platforms to support a lean and effective Project Steering Committee including key global partners and representatives of the GFW pilot countries. WRI has 30 years of success managing complex partnerships.
2. Weak coordination among ministerial bodies and lack of support from national governments in pilot countries Level: M	Based on the lessons of other global/regional UNEP-implemented projects, it will be critical to foster national governments' ownership from the onset. Practical measures to pre-empt this risk will include the establishment of GFW coordination teams in each pilot country, comprised of both civil society and government personnel. Country teams will also be involved at the strategic level as members of the global GFW Steering Committee as the main project governance structure. To ensure sustainability, measures will be taken to ensure that the government and non-government partners are fully enabled to continue to take full advantage of the GFW after the project cycle has ended.
3. Sub-optimal capacity in pilot countries hampers sufficient uptake of the GFW Level: M	<p>Existing gaps in capacity in pilot countries were identified during the PPG phase of this project. A sound and well-designed capacity building program targeting government and non-government partners constitutes a critical element of the project, and will be essential for project success and as the basis for long-term sustainability.</p> <p>A core component of this project is to build the capacity of government and other local stakeholder to make practical use of this data, including through transfer of knowledge, skills, and technology. Key capacities include:</p> <ul style="list-style-type: none"> • Capacities to carry out national independent validation of global tree cover loss products • Capacities to customize global methods for tree cover loss detection to create more accurate and appropriate national data products • Capacities to generate and aggregate national and subnational datasets pertaining to forest landscapes • Capacities manage data in a centralized digital repository and make data accessible to the public. • Capacities to analyze complex data to generate policy-relevant insights. <p>In addition, the strength of GFW is the ease of use and public, free availability of data. This will remove most barriers to broader use at national and global level, as the uptake of GFW will require minimal capacity and will thus be accessible to most stakeholders without the need for dedicated training.</p>
4. Insufficient awareness of biodiversity conservation, land degradation and climate change issues Level: M	<p>With respect to biodiversity and climate change, several project partners in the WRI and UNEP networks are already quite active on addressing these issues and working collaboratively with the GFW pilot countries and globally through synergistic parallel projects.</p> <p>The project will build upon the above initiatives to support and enhance project interventions in the pilot countries by highlighting the potential for GFW to improve livelihoods while reducing land degradation, supporting biodiversity conservation and contributing to climate change mitigation.</p>
5. Political instability and	GFW is hugely beneficial to countries that are relatively well governed (such as Georgia) since they can rapidly take full advantage of, and embrace the capabilities of, the system. Countries

<p>potential social upheaval. Level L (Georgia) and H (Madagascar)</p>	<p>that have a higher risk of slipping towards weaker governance or political instability (such as Madagascar in recent years) can also benefit from the continued transparency and flow of information provided by GFW, even in the worst of times. The project will support a completely open design of the GFW global platform and the continued crowdsourcing and even potential whistleblower capabilities. Therefore it is expected that the very open and transparent nature of the GFW system, and the wide range of government and non-government stakeholders that will be able to access GFW, will provide sufficient mitigation for this risk and ensure the impact and sustainability of project results, irrespective of evolving socio-political contexts in the pilot countries.</p>
<p>6. The needs and priorities of the more disadvantaged groups of society, including indigenous and women's groups are not adequately taken into account by the project Level: M</p>	<p>All aspects of the project's design, implementation strategy and monitoring and evaluation process will closely look at this important aspect and take this risk into account. This will inform the set-up of adequate stakeholder consultation and involvement mechanisms in pilot countries from project outset, with full support from all project partners, and under the auspices and supervision of UNEP as the GEF implementing agency. Continued and focused and well-targeted communication, consultation, education and involvement efforts with local community groups will be implemented in the pilot countries. A comprehensive and well-costed communication plan for each pilot country will be developed during the PPG and operationalised as a first step at the outset of the project to inform and engage national partners in the new GFW initiative and mitigate any risks of misunderstanding or conflict. The project will also place emphasis the generation of socio-economic benefits associated with the increased use and open access to a transparent GFW.</p>
<p>7. Persisting technological challenge makes data unreliable or insufficiently accurate to suit envisaged purposes. Level: L</p>	<p>Key weaknesses of the current technology include lack of differentiation between different types of tree cover loss (e.g. loss of plantations versus natural forests), incomplete understanding of accuracy across different geographies, inadequate spatial resolution to detect small-scale forest change, and inadequate temporal resolution to enable preventative action. GFW partners are exploring multiple approaches to improve the accuracy and precision of global forest monitoring systems:</p> <ol style="list-style-type: none"> 1) Global validation studies of all tree cover loss products using higher resolution imagery (2015) 2) Continued enhancements to existing algorithms based on validation results (ongoing) 3) Pursuit of additional datasets that can be combined with the UMD data to provide context about tree cover type, e.g. data layers showing locations of primary forests versus tree plantations (ongoing) 4) Exploration of new sources of remote sensing data (Sentinel-2, SkyBox, Digital Globe, etc.) and new computational methods (e.g. artificial intelligence) to create the next generation of change detection algorithms (five year timeframe)
<p>8. Key potential users do not fully trust GFW information despite its reliability and accuracy. Level: L</p>	<p>GFW's core information will be neutral and objective, published only after thorough peer review, and vouched for through WRI's quality control process. Opinions and judgments based on the information will not form part of the core information available on GFW. Crowd-sourced information, for which WRI will not be able to apply in-depth quality control, will be clearly identified as such and WRI will not vouch for its quality. The GFW data sources, algorithms, partnerships and funding will all be open to scrutiny. As far as possible, open-source methods are being used. Raw datasets will be accessible and downloadable from the GFW platform enabling independent cross examination of the information. The present project incorporates support for thorough national-level systems for validating data.</p> <p>WRI will always encourage and welcome any corrections made to information. If any governments, companies or other organizations take issue with information available on GFW, they will be able to easily communicate those concerns with WRI via an online feedback mechanism or by contacting WRI. WRI in turn will respond quickly to assess and consider any concerns. WRI will ensure resources are available to travel to and engage directly with senior officials in governments or organizations that have concerns about GFW and would like to constructively engage. WRI will ensure that the information and services provided by GFW are complementary to those provided by others, e.g., the Forest Resources Assessment by FAO.</p> <p>Furthermore, in order to build local ownership and trust in these data products, it is also critical</p>

	<p>for independent validation to be carried out nationally by local stakeholders. This project will support the Governments of Georgia and Madagascar to conduct independent validation of the global tree cover loss products in their countries. They will also be empowered to customize global algorithms to create a more accurate national product. Furthermore, the project will enable Georgia and Madagascar to conduct policy-relevant analyses using the global tree cover loss data in combination with their own local data. For example, a researcher from the Ministry of Forestry in Indonesia recently combined UMD tree cover loss data with Indonesian primary forest data to estimate annual loss of primary forest starting in 2000.</p>
<p>9. Despite enhanced transparency generated by GFW, governance issues and/or lack of political will limit uptake and on-the-ground impacts Level: M</p>	<p>GFW works with government, corporate, and civil society partners to identify and test opportunities to apply data in ways that support decision-making and improve on-the-ground implementation. The “use cases” proposed in this ProDoc will be the primary vehicle to apply GFW data directly in the context of relevant policy and implementation issues in Georgia and Madagascar. WRI is also working closely with the Governments of Cameroon, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon, Liberia and Republic of Congo to develop and apply nationally calibrated applications and datasets, powered by global GFW data. Through the analysis of these and other use cases being pursued by GFW globally (e.g. GFW Commodities), the project will create a strong case and a set of practical tools for changing business-as-usual practices. Part of the analysis under relevant use cases will involve the identification of target uptake pathways and related indicators.</p> <p>GFW does not propose to resolve all governance challenges in each country, but it can make significant contributions with respect to transparency and related tools to support greater government accountability, sector coordination, and civil society participation. GFW will seek to identify and collaborate with relevant initiatives in each country to seek a more holistic, long-term approach to improving the multiple dimensions of governance.</p>
<p>10. Replicability is limited by distinctive nature of pilot countries Level- L</p>	<p>While Madagascar is unique in many ways, lessons learned from piloting GFW here will certainly inform improved application of methods, tools and approaches from Southern Africa to Australia. GFW’s application in Georgia will likewise inform improved methods, datasets and approaches for the Caucasus countries, Turkey, etc.</p> <p>Nevertheless, it is recognized that Madagascar and Georgia are not entirely representative of countries where GFW will be most used and most useful. With this in mind, the project design includes substantial lesson learning and lesson sharing activities involving over a dozen countries where GFW outreach will be taking place.</p> <p>Through these national engagements and partnerships, the project aims to:</p> <ul style="list-style-type: none"> • Better understand country needs in order to enhance GFW’s growing suite of data and tools and to ensure that these are highly relevant and practical for national-level use. • Identify replicable and scalable “use cases” related to the application of GFW data and tools. The extent to which these use cases will be generalizable will depend on the nature of the use case itself, as well as the degree to which various countries share similar ecological and socio-economic contexts. • Raise the global bar concerning transparency and data disclosure by creating friendly competition between countries. We have seen this model work very successfully through our work to promote land use allocation transparency in Central Africa.
<p>11. GFW proves to be insufficiently cost effective in certain uses and contexts Level - L</p>	<p>Compared to analogous approaches in which an individual country would ‘start from scratch’, it is estimated that the baseline information and knowledge provided free of charge by the GFW system represents a 50-75% reduction in costs. This represents a first and highly positive example of relative cost effectiveness based on the use of generic global-level information, supported by national-level refinement and validation.</p> <p>In addition, the cost effectiveness of the GFW-based approach should be evident from the extensive savings in enforcement costs that a data-driven approach enables. Relatively costly site visits can now be preceded and selected based on up-to-date deforestation data and alerts. Depending on country circumstance, this benefit may be expected to reduce monitoring and enforcement costs by 50-75% or more. And this is just one benefit of the system. Others, for example, those associated with enhanced planning due to better data, are also likely to be substantial.</p>

3.6 Consistency with national priorities or plans

In both pilot countries, the maximum level of integration with ongoing and planned national activities will be achieved thanks to the critical coordination and facilitation role played by the national Ministries (ref. also section A.4). This will ensure timely and consistent alignment and synergy with all relevant ongoing and planned programs aimed at reducing deforestation, preventing land degradation and conserving biodiversity in the pilot countries. This approach will guarantee the complementarity and incrementality of the GEF intervention, and will directly contribute to augmenting progress towards the achievement of relevant goals set in national plans and strategies.

Consistency with national priorities and plans will also be ensured through close co-operation with the UN Country Teams in each country. As noted in **Table 11** below, consultations will be held with country team members during the inception phase in order to identify ways to optimize the project's contribution to each country's UN Development Assistance Framework (UNDAF).

Specific plans and strategies that the GEF project will support are listed below for the two pilot countries:

Georgia: Georgia signed the UNCCD in 1999 and the UNFCCC in 1994. The project is aligned with the National Action Program to Combat desertification (2003) and particularly with the priority actions listed in Chapter 11 (actions 19, 20), Chapter 13 (4,5,8), Chapter 15 (3,5). The project is also aligned with the national priorities set forth in the latest National Communication to the UNFCCC (2009), and will specifically support the implementation of strategic objectives #: 1, 2, 3, 5, 6, 7, 12, 14 and 24. The project is also aligned with Georgia's ongoing program to address the key rural issues within the framework of the Sustainable Agricultural Development Plan for Georgia (SADG, 2012-2022). Georgia's National Environmental Action Program 2012-2016 (NEAP-2) also outlines eleven themes including *"Improve the functional state of forests through the development of sustainable forestry."* NEAP-2 also presents several cross-cutting issues, such as environmental impact assessment and permitting, enforcement, monitoring, the scientific basis for decision-making and the need for geo-informational systems. It further highlights as areas of major need monitoring, inspection and enforcement systems. GFW will support Georgia in providing a monitoring and management tool which can help direct law and license enforcement, fire monitoring, private sector partnership and innovation, and education efforts and thus improve and safeguard the delivery of forest ecosystem services by contributing to Target 2 "reduction of unsustainable and illegal forest use" and its action measures 1) Develop and test Forest Information System, 2) Develop and test forest monitoring system and 3) develop and implement training modules in forest enforcement. Finally, the project will contribute to UNDAF 2011-15 thematic areas 1 (Poverty reduction) and 3 (Disaster risk reduction).

Madagascar: Madagascar signed the CBD in 1996 and the UNFCCC in 1998. The project contributes to the implementation of relevant national sustainable development plans and strategies and particularly to "Madagascar Action Plan" 2007 – 2012 (MAP), which, given current politics, is still the valid national socio-economic development plan. This is focused around 8 commitments, of which the seventh is "Madagascar will be a world leader in the development and implementation of environmental best-practice.... We will become a "green island" again...". The MAP includes Madagascar's strategy and priority programs for addressing deforestation and forest degradation. The GFW will contribute to the achievement of four major challenges outlined in MAP:

- Challenge 1. To increase the protected areas for the conservation of land, lake, marine and coastal biodiversity - Goal: to increase the area of protected areas from 1.7 million to 6 million hectares
- Challenge 2. To reduce the natural resource degradation process - Goal: to maintain the remaining 9 million hectares of forest and wetlands for the conservation of its natural resources and the sustainable use of its forest, lake, marine and coastal resources.
- Challenge 3. To develop the environmental reflex at all levels - Goal: to mainstream the environment into all sectoral plans and develop a strong and effective environmental reflex
- Challenge 4. To strengthen the effectiveness of forest management - Goal: to strengthen the institutions responsible for environmental management – the ministry and environmental protection agencies – to ensure professional policy making and regulatory framework and to provide technical support to the development and implementation of sector strategies.

The project is aligned with the priorities identified in the second National Report to the UNFCCC (2010), and particularly with the priorities set in section 5.4.2.3 (page 83): “*le renforcement des Programmes Forestiers Nationaux (PFN) par le boisement ou reboisement avec des espèces diversifiées, la mise en place d’un programme de grande envergure de boisement et de reboisement par l’augmentation des budgets gouvernementaux affectés à la protection et la création des forêts.*”.

The project also contributes to implementation of the following plans and strategies: National Forestry Policy (1997), which has a strong focus on conservation; The National Strategy for Forest Genetic Resources (2007) and the National Report on Forest Genetic Resources (2012) which both place a strong emphasis on the conservation of key endemic tree species.

The project is hosted in the same ministry as the Forest Carbon Partnership Facility (FCPC) - REDD+ process. The FCPC Readiness Plan (RP) for MRV in Madagascar is just taking first steps. GFW will directly contribute to various elements of RP’s implementation, and the set up and testing of GFW will also be aligned with the components of the RP.

The project is aligned with all relevant National Environmental Policies, notably as reflected in the National Environmental Action Plan and the 3rd Phase of the National Environmental Program; Environmental Charter (Updated in 2012).

The project will contribute to the implementation of the National Policy to fight against climate change.

The project will help the implementation of the National Mitigation Appropriate Actions (NAMAs) of Madagascar.

The project will also contribute to implementation of the following biodiversity plans and strategies: The Madagascar National Biodiversity Strategy and Action Plan (2000); The ‘Durban Vision’, announced in September 2003 at the World Parks Congress in Durban, to triple Madagascar's protected areas in five years and increase the country's protected habitats from 1.7 to 6 million hectares - or from 3 to 10 percent of the nation's area; The 4th National Report to the Convention on Biodiversity (2011) which identifies the importance of conserving key flora and fauna species.

The project will directly contribute to the achievement of the **Aichi Targets** of the Convention of Biological Diversity (CBD) as illustrated in **Table 12** below:

Table 12: Contribution to Aichi targets

CBD Aichi 2020 Targets which the project will contribute to	How the project will support the achievement of each target – initial SMART indicators (to be further selected and refined at CEO submission)
Target 3 (incentives for BD conservation)	GFW will monitor and independently verify incentive and ‘payment for ecosystem services’ schemes, to support the conservation and sustainable use of biodiversity – # of new schemes adopting GFW as a management/verification tool, and areas covered by GFW-supported schemes (ha).
Target 5 (loss of natural habitats including forests)	GFW will monitor and independently verify with great accuracy and in near-real time the rate of loss of all natural habitats, including forests, and monitor trends in forest degradation and fragmentation, and support forest conservation and law enforcement measures – reduced rates of forest loss and degradation.
Target 12 (species extinctions)	GFW provides an essential management tool to enhance the conservation effectiveness of existing protected areas, as well as monitor habitat status for non-protected areas – no. of protected and non-protected areas adopting GFW as a biodiversity conservation tool, and areas covered in ha. It also can monitor extinction risk for red list species and generate habitat analysis for Alliance for Zero Extinction species.
Target 14 (ecosystem services - ES)	GFW will monitor and independently verify incentive and ‘payment for ecosystem services (PES)’ schemes, to support the conservation and restoration of degraded ecosystems and associated flow of ecosystem services – # of new PES schemes adopting GFW as a management/verification tool, and areas covered by GFW-supported schemes (ha).
Target 19 (BD science improved)	GFW provides an innovative, highly effective, near-real-time, free and user-friendly management tool to support BD conservation and monitor the status and trends of habitats hosting globally important biodiversity – level of GFW uptake: i.e. no. of studies, reports and publications on biodiversity conservation adopting GFW as a habitat monitoring tool.

Furthermore, GFW has the potential to significantly contribute to the delivery of the targets and objectives of both the UNFCCC and UNCCD. Parties under the UN Framework Convention on Climate Change (UNFCCC) are negotiating the REDD+ framework (reducing emissions from deforestation and forest degradation, and enhancement of forest carbon stocks in developing countries) and the project will provide a platform for all MRV efforts. The UNCCD also seeks to monitor and address land degradation which is also largely induced by deforestation and forest degradation, and the GFW can be instrumental in defining policies and supporting action in signatory countries worldwide.

Finally, the project will contribute to two of the three expected results of Madagascar's 2015-19 UNDAF, as follows⁵³:

- *Vulnerable populations in the intervention areas, gain access to income and employment opportunities, strengthen their resilience and contribute to inclusive and equitable growth for sustainable development:* The project will support more inclusive, sustainable and equitable management of the country's forest areas.
- *The public institutions, civil society and the media at central and decentralized level, effectively carry out their roles and are accountable to a peaceful governance, in which human rights are protected:* National- and local-level institutions will have increased capacities and tools at their disposal for making informed decisions about forest management, including the ability to target areas in the process of being deforested. More transparent information will contribute to enhanced governance, while the contribution of media to this process will likewise be enabled.

3.7 Incremental cost reasoning

The baseline:

The project's global baseline is defined as the existing GFW platform, absent any changes or active support beyond bare maintenance. Thus, all global-level inputs designed to update and/or improve the site are considered as incremental.

At pilot country level, we assume that no special efforts are made to support uptake or remove associated barriers.

Under the above assumptions, GFW would of course remain a highly useful tool for global and national-level forest management. However, several persisting shortcomings would be apparent and would limit its potential effectiveness. These include the following:

- Absent country-level validation, there could be skepticism in some areas regarding the accuracy of the data on forest cover change;
- Deforestation of certain forest types, such as dry forest in Madagascar, and degradation of most forest types, would remain beyond the capacity of the system to pick up, given current resolutions;
- Lack of national-level data would limit the tool's potential effectiveness for many national and local level management challenges, including landscape-level management;
- Given limited governmental capacities, the risk of slow or even minimal uptake would remain in many countries, in many cases including simple lack of awareness of the system and its capabilities;
- The GFW partnership would face an uncertain future;
- There would be little active understanding of how GFW was working to improve forest sector outcomes around the world;
- GFW would provide only minimal support to carbon-based conservation efforts such as REDD+;

⁵³ Based on unofficial translation from the French original.

- Commodity-based uses of the system would remain limited.

The GEF Alternative:

Under the GEF alternative, incorporating substantial incremental co-financing support, the utility of the GFW platform would be greatly enhanced. More specifically:

- Country-level validation increases the perceived and actual accuracy of GFW data;
- Increasing use of high resolution data helps to resolve uncertainty, and better quantify, deforestation and degradation trends and improve the timeliness of associated alert systems;
- Incorporation of national data helps to create highly useful forest geoportals in pilot countries;
- Uptake in both pilot and target countries is speeded through active intervention and lesson learning / knowledge dissemination;
- Well understood examples are available of the potential and actual applications of GFW data to enhanced forest and land use management systems.
- Expanded and extended data sets make GFW an increasingly useful tool for forest carbon-related analyses and related planning / implementation;
- GFW becomes a go-to platform for companies, NGOs and civil society people interested in minimizing the impacts of increased commodity production on forest extent and condition.

Incremental benefit:

Implementation of the GEF-led alternative is expected to have a variety of important national- and global-level incremental benefits. These include:

- Reduced rates of deforestation and forest degradation in pilot and target countries, with a range of associated global benefits related to conserved biodiversity, reduced carbon emissions and reduced rates of land degradation (see results matrix and tracking tools for quantified estimates).
- Improved long-term basis for science-based, inter-sectoral co-operation among government ministries and agencies representing productive, extractive and sustainable use / conservation interests, as well as private sector, civil society and academia.

Like global environmental benefits, socio-economic benefits will derive from changes in management brought about or otherwise enabled through the use of GFW and more particularly, from the transformation of information into action. Such changes will be directly supported via two mechanisms: use cases and landscape level demonstrations. Socio-economic benefits will be more concentrated in use case areas—Adjara in Georgia and Boeny in Madagascar—but will also extend throughout each country's forested areas. Socio-economic benefits will include the following:

- *Landscape-level demos:* Benefits associated with integrated, participatory, landscape-level forest and land use management including:
 - Optimization of land/resource use allocation will be facilitated by intersectoral land-use planning that is transparent and based on access to high quality information regarding trade-offs in land-use choices - guaranteeing less impact on natural systems and higher long-term productivity of ecosystem functions (land, water, biodiversity), increased production of goods and services and improvement in livelihoods.
 - Multi-stakeholder participation in land-use planning and resource allocation will facilitate the needs and rights of local communities being taken into account and greater benefits from the land and natural resources accruing to local stakeholders.

- *Use cases:* Socio-economic benefits associated with pilot country use cases overall are expected to include:
 - Transparency in forest land-use allocation, forest cover and forest change will promote a more level playing field for non-governmental entities, facilitating empowerment of communities to be able to exercise their rights over forest-based natural resources and to participate in decisions affecting local land-use and development;
 - Access to improved information on land-use allocation, forest cover and forest change will enable CSOs and communities to better monitor use of forest resources by the government, private sector or other actors – ensuring better accountability;
 - Through improved access to forest information, coupled with improved capacity to apply this information to action, local communities will be better equipped to defend their lands against unwanted encroachment or appropriation by another party;
 - Local communities will be better able to sustainably management their forest resources, facilitated by locally tailored GFW tools and capacity to use them;
 - Improved conservation of riparian forests and overall improved watershed management will primarily benefit poorer members of society through increased access to water resources.

Potential socio-economic benefits associated with specific use cases include the following:

- Protected area management: Assessing and detecting threats to protected areas by fire or deforestation coupled with improved law enforcement keeps ecosystems functioning in protected areas, which will enable flow of ecosystem services which are inputs into household production and thus an important asset held by the rural poor. Healthy functioning ecosystem will also help maintain tourism which will create additional income streams in the region.
- Production forest management: By assessing current levels of logging and deforestation, production can be better regulated at a lower cost of access to information; production forests can be certified and get higher prices for their products,.
- Forest fire alert systems: Early detection of potentially large forest fires can prevent or mitigate possible loss of lives and livelihoods thereby enhance livelihood security.
- Forest assessment, inventory and monitoring: Clear understanding of forest types, and their rate of change is major input for land use planning and forest planning to enhance resilience and ensure long-term income and ecosystem services for creating wealth and enhancing human well-being.
- Forest carbon analysis and management: the possibility to quantify carbon is a first step to monitor, report, and verify carbon stocks of forest which may lead and access international or national funds to keep forests and reward communities for their efforts to sustainably manage forest
- Restoration: Measuring restored / reforested land can help to quantify carbon and ecosystem benefits; by introducing trees into the landscape, agricultural production can be improved which will enhance food security and carbon finance may be obtained for local communities.

3.8 Sustainability

The GFW initiative is a partnership of many organizations which provides a totally new opportunity for a broad range of stakeholders to collaborate in the monitoring of forests and land use. For a comparison between GFW and earlier systems, illustrating the technical complexity and innovativeness of the project, please refer to <http://www.wri.org/gfw2>. The GEF project will support system enhancement, including the global first of tree-loss alerts generated using 30m LandSat simultaneously with full global coverage, and application in selected pilot countries. It will also support the achievement of financial sustainability as well as scaling up and rapid application of lessons learned at a national and global level (component 3).

The global demand and scaling up potential for innovative and user-friendly tools such as the GFW is quite evident (see videos of endorsements from key stakeholders). The project will provide an innovative, cost-effective, credible and transparent tool for observing key aspects of performance of forest certification, payment for ecosystem services schemes and REDD+ MRV, while increasing the opportunities for actually responding rapidly enough to illegal forest clearing and logging.

The project promises an innovative tool to governments and non-government stakeholders alike, significantly increasing the efficiency and cost-effectiveness of their forest stewardship efforts. As new satellite constellations with greater spatial and temporal resolution are launched, or as new algorithms for interpreting remote sensing data are developed and rapidly adopted by GFW, the initiative will integrate information from these new platforms and new algorithms into the GFW system. The specific project deliverables and lessons learned under component 1 and 2 are designed to be rapidly shared and replicated in other countries.

The project will support the development of national-level data platforms which will be integrated with GFW global. Maintaining these national-level platforms will become the long-term financial responsibility of each pilot country, while the global-level GFW layers will continue to be supplied free of charge through the global GFW partnership. The process of identifying and securing budgetary and non-budgetary resources for long-term maintenance of national-level platforms will be initiated during the inception phase and continue throughout the project.

3.9 Replication

The project includes both global and pilot country components. Component 2 is primarily focused on uptake of the global GFW system, as well as replication of lessons learned by pilot countries under Component 1. The latter will include thematic aspects, such as demonstration of GFW within protected area or concession management, which will be the subject of careful lesson learning and dissemination in support of potential replication. Altogether, Component 2 represents a substantial investment in widespread dissemination, uptake of GFW, and replication of its use in forest sector management, around the world.

Within each of the pilot countries, the project will be supporting demonstration case, which will take a more comprehensive approach to use of GFW for landscape-level planning. Given that each of these demonstrations is sub-national in nature, care will be taken to learn lessons from the experiences for potential application within and beyond each of the pilot countries.

3.10 Public awareness, communications and mainstreaming strategy

Raising public awareness about, and understanding of, deforestation and forest degradation is among this project's fundamental objectives. This will include efforts at both pilot country and global levels. The overall strategy may be characterized as one based on the notion that increasing knowledge of, and participation in, forest management issues, including deforestation, will help to shed light on, and thereby to combat, illegal and otherwise inappropriate forest management practices.

The project will also place substantial emphasis on communications. The GFW site is itself the project's central communications medium, one in which two-way communications, via crowd-sourcing and social media tools, will be increasingly encouraged during the course of the project. In addition, the project incorporates support for other communications, including blogging and other GEF-based analytics. Finally, high-level policy communications will be used to disseminate the project's key findings amongst policy makers, business leaders and other decision-makers.

Each of the pilot countries will benefit from technical co-operation aimed at increasing public awareness, and broadened uptake, of GFW. Consultations undertaken during the PPG represented the first key steps in raising national-level awareness in these countries about the potential uses of GFW. This process will be broadened as well as deepened during the first year of project implementation. A series of national and

local-level workshops will introduce key stakeholders to GFW and further assess analytic needs. Outreach, awareness raising and participation efforts will aim to reach, among others, local people in forest-dependent communities. Outreach to such groups will be made easier by plugging into existing governmental and NGO networks and community groups. This effort will be closely linked to, and designed to support, the specific use cases identified and supported under 1.1.4.

A key objective of the project's awareness raising and communication strategy will be to increase participation in, and contributions to, GFW. This will be further enabled by enhanced GFW upload features, as well as crowdsourcing and the development of mobile and offline apps (see Output 1.2 above).

Mainstreaming will be supported both through awareness raising, as above, and through a broad-based participation of multiple sectors in project activities, particularly in implementation of use cases (see Output 1.1.4) which will touch upon and impact multiple issues, sectors and institutional stakeholders.

Finally, collaboration with universities, schools, NGOs, donors and media will serve to increase knowledge about forests and to support national-level efforts to generate and publish value-added, GFW-based analyses.

3.11 Environmental and social safeguards

In accordance with the GEF Policy on Environmental and Social Safeguards⁵⁴, safeguard measures will be built into national project design and implementation. Under this project, Strategic Environmental and Socio-economic Assessments (SEAs) will help to streamline and focus the incorporation of environmental and social concerns into the decision-making process.

An SEA Scoping Exercise will be undertaken at the commencement of the project to ensure that particular attention is paid to environmental and social concerns with regard to the project interventions. The exercise will consider the implications of the Project for biodiversity and ecosystem conservation and on the creation of sustainable livelihoods. It will also ensure that the interventions identified in the Project components give due consideration the comments and recommendations of stakeholders and how these comments and recommendations are incorporated into the Project delivery. The Scoping exercise will also evaluate opportunities to consolidate and implement other environmental and social initiatives pursued by local stakeholders, NGOs and other partnerships.

Paramount in the SEA scoping is the determination of the extent to which the Project will change prospects for biodiversity conservation and its sustainable use in Georgia and Madagascar. Key general questions, to be asked during the scoping exercise will include, *inter alia*:

- Are ecosystems related to the project fragile or degraded?
- Will the project cause any loss of precious ecology, ecological, and economic functions due to construction of infrastructure?
- Will the project cause impairment of indigenous people's livelihoods or belief systems?
- Will the project cause disproportionate impact to women or other disadvantaged or vulnerable groups?
- Does the project include measures to avoid corruption?
- Will the project cause technology or land use modification that may change present social and economic activities?
- Are property rights on resources such as land tenure recognized by the existing laws in affected countries?
- Will the project cause social problems and conflicts related to land tenure and access to resources? Does the project incorporate measures to allow affected stakeholders' information and consultation?

⁵⁴ GEF Policy on Environmental and Social Safeguards (2011) online at http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.10.Rev_1.GEF_Policies_on_Safeguards_and_Gender.May_25_2011.pdf

Section 4: Institutional Framework and Implementation Arrangements

This section provides details of the project's institutional framework and implementation arrangements. **Figure 2** presents an organizational chart.

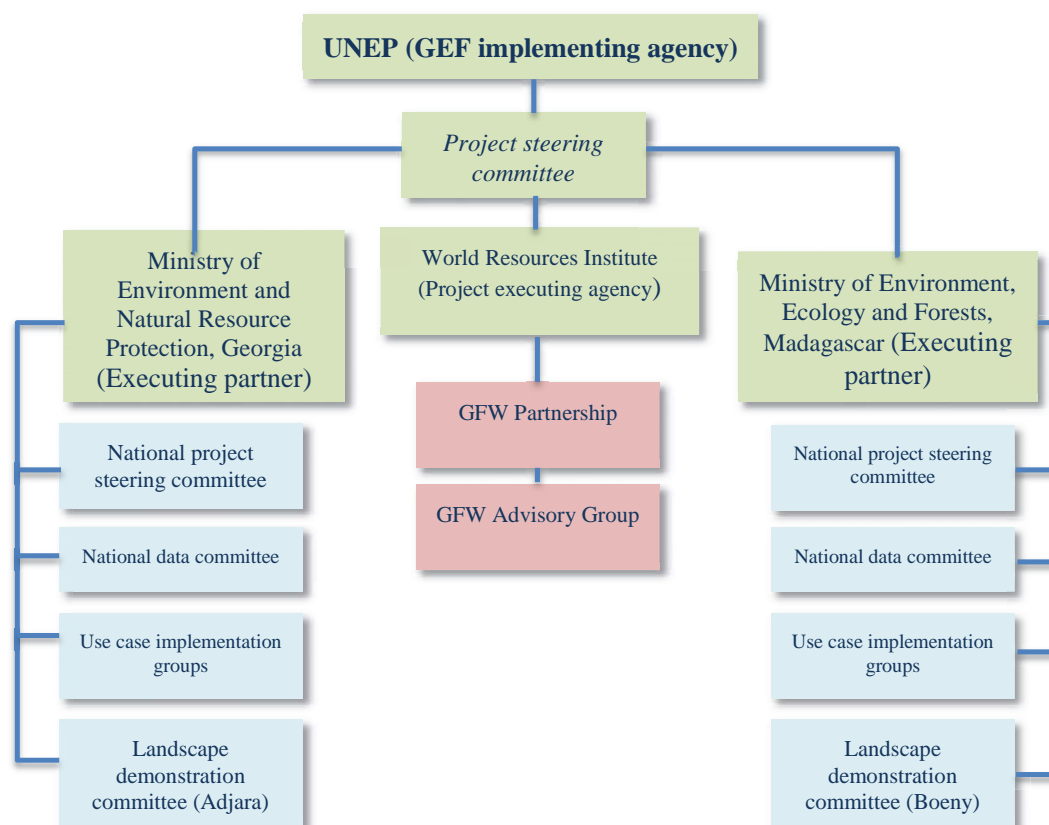


Figure 2: Organizational chart

Implementation and execution

The World Resources Institute (WRI) will act as executing agency for the overall project, with all associated responsibilities. Following the conclusion of its executing agency agreement with UNEP, WRI will conclude sub-grants with the executing partner in each pilot country. These are the Ministry of Environment and Natural Resources (MENR) in Georgia and the Ministry of Environment, Ecology and Forests (MEEF) in Madagascar. Sub-grant agreements will be based on, and incorporate, the pilot country budgets (see Appendix 1), which already define spending allocations under each of these grants.⁵⁵

Executing partners in each country will be directly responsible for execution of all outputs and activities outlined in the project document. WRI will be responsible for technical support and oversight of pilot country work (see project management below for related arrangements).

Project management and technical support

WRI will assign one or more part-time senior technical experts / managers at its headquarters⁵⁶, who will

⁵⁵ Approximately 7% of each country allocation will remain within the overall budget, i.e. will be excluded from the sub-grants, to finance international consultant support to each pilot to be supplied as per this document and in close consultation with the executing partner in each country.

⁵⁶ Potentially one per country, on a part-time basis.

provide technical support as well as being responsible for overall project management on behalf of the executing agency. In addition to providing direct technical support and management of global components, the responsible WRI expert(s) will provide technical support to, and monitoring of, pilot country activities. For this purpose, (s)he/they will maintain close contact with the respective national coordinators and staff in each pilot country.

In addition to the senior experts assigned to the pilot countries, WRI will identify and recruit additional short-term international consultants based on ToRs agreed with each pilot country. These consultants will support technical support for implementation of key components of the pilot country work, including data platform development and use case implementation.

Steering Committees

Global / integrated

The project will build on the existing and effective coordination mechanisms established as part of the GFW partnership, which is convened and managed by WRI, the executing agency of this GEF project. Regular GFW meetings and internal and existing external communication channels will ensure adequate coordination with other initiatives and with the broad range of partners and global stakeholders mentioned in section 5.

Annual GFW Partnership meetings will be attended by a representative of each of the pilot countries, as well as a UNEP representative (UNEP is also a GFW Partner). Pilot country representatives will be asked to provide brief reports to the Partners' meeting on country-level progress, lessons learned, etc.

The GEF Implementing Agency (UNEP) will be part of the project Steering Committee and will also contribute to ensuring that appropriate linkages and coordination is maintained with relevant programs of all other relevant UN agencies, the UN REDD programs, the UN Finance Initiative, the UNEP Forest Group, the UNEP-UNDP Poverty and Environment Initiative, the UNEP-supported "Eye on Earth" and the "Global Environment Alert System" (ref. section B.3), as well as with global environmental conventions and particularly with UNFCCC, CBD and UNCCD as well as the newly formed IPBES. UNEP and WRI have a long and successful history of productive partnership.

Immediately following the Partners' meeting, a Project Steering Committee (PSC) meeting will be convened. This meeting will focus on issues associated with GEF-funded elements of the broader GFW effort—including global as well as pilot country work. In particular, pilot country representatives will report on country-level progress under relevant outputs of Component 1 where they are acting as executing partners. For its part, WRI will report on both the results of GEF-funded work under global components as well as its oversight work with respect to pilot country outputs.

Pilot country level

Prior to the above annual overall PSC meeting, national-level PSCs will have met and prepared annual reports and forward workplans. National-level PSCs will be chaired by the respective executing partner in each pilot country. Representatives of UNEP and WRI will also act as members of these national PSCs.

Other pilot country committees

Pilot country work is concentrated under Component 1, more specifically under Outputs 1.1.3, 1.1.4, 1.1.5 and 1.2.1. With the exception of 1.1.5, which will be implemented directly by the project coordination unit in each country, each of these outputs will have a dedicated committee overseeing its work. These are as follows:

- *Data committees:* Output 1.1.3 focuses on the data sets—both global and national in origin—which are or will be part of the GFW system and the linked national-level forest geoportals. Within each pilot country, key data management experts from various partners (see stakeholder section below) will be gathered under this committee to oversee and validate this work.
- *Use case implementation groups:* Under output 1.1.4, use cases will be implemented to demonstrate the use of GFW data in various management contexts. National-level steering committees (see above)

will be responsible for approving final use case designs, workplans and budgets. In addition, at the level of individual use cases, key stakeholders will be brought together for technical discussions, data sharing and support to use case implementation.

- *Demonstration component local management committees:* Under output 1.1.5, the use of GFW for landscape-level management, including in various use case contexts, will be demonstrated within a defined geographic area. These areas are Boeny in Madagascar and Adjara in Georgia. A local committee will be established in each of these provinces in order to support implementation of the demonstrations there. The national coordinator of each pilot country will serve as a member of this local committee.

Other global committees

As described under Output 3.1.3, a global technical advisory committee will be established to ensure operational transparency and effective management, especially in regards to the latest remote sensing information, algorithms and needed computing power and long-term sustainability of the initiative. The Advisory Group will hold quarterly virtual meetings and will include experts and champions of the initiative. Technical committees (subsets of the GFW Advisory Group) will address specific technical challenges related to data and will be involved in the development of articles to scientific journals documenting methodologies for key GFW datasets. The Committee will also put forward open and regularly updated communications regarding known uncertainty levels and limitations related to specific data available via the GFW website. Finally, workshops will convene data scientists and relevant stakeholders to address questions and concerns about specific datasets and associated methodologies.

Section 5: Stakeholder participation

During the Project Preparation Grant (PPG), project formulation team members undertook extensive consultations with potential partners and actors to explore roles and inputs and ways of creating added value and synergies. A detailed description of the major stakeholder and partner groups identified for the project, including their participation in management and coordination, is presented in **Table 13** below, as well as in the national GFW reports (see **Annexes 17** and **18**).

In the project pilot countries: the project will be coordinated at the national level by the Ministry of Environment and Natural Resource Protection (MENRP) of Georgia, and by the Ministry of Environment, Ecology and Forests of Madagascar. The involvement of project key stakeholders in the pilot countries will be coordinated by the above national coordinating bodies, and key stakeholders will include: Forestry Departments, Protected Areas Management Authorities, Law Enforcement authorities, environmental CSOs, local community groups living within and near forested areas and protected areas, academic and training institutions, and private sector (esp. sectors involved in forestry operations).

The project will also seek to engage directly with existing national FLEG / FLEGT programs (e.g. in Madagascar as well as with the MRV components of national REDD programs).

Table 13: Key stakeholders and their participation in the project

Country / Global	Category of stakeholder	Specific stakeholders ⁵⁷	Association with / participation in project
Global	WRI		Executing agency
	Other GFW Partners	40+ organizations (see www.gfw.org for list)	Source of co-financing; beneficiaries, particularly from component 3 (strengthening the partnership)
Georgia	Government	Ministry of Environment and Natural Resource Protection (MENRP): Forest Policy Service	Executing partner; Co-ordinates use case implementation
		Ministry of Environment and Natural Resource Protection (MENRP): Service of climate change	Participates in use case (5)
		National Forest Agency	Participates in use cases (1,2,3,5,6)
		Agency of Protected Areas	Participates in use cases (1,2,3,4)
		Service of Biodiversity Protection	Participates in use cases (3,6)
		Adjara Autonomous Republic Forest Agency	Participates in use cases (1,2,6)
		National environmental agency: Department of licensing	Co-ordinates demonstration component
		Department of Environmental Supervision	Participates in use case (1,5)
		Environmental information and education centre	Participates in use case (1)
			Participates in use cases (1, 4)
			Participates in execution of capacity building components
		Council of national security and crisis management	Participates in use case (2)
		Department of emergency management	Participates in use case (2)
	Bilateral donors	Local self-governance authorities	Participation in use cases, as and where appropriate (1)
		GIZ	Implementing co-financed activity
		Austria	Financing co-financed activity
		UN system / UNDAF	Consultations planned for inception phase to enhance project's contribution to UNDAF goals and objectives
	International donors, projects and NGOs	Caucasus Environmental NGO Network (CENN) project: "Sustainable Forest Governance in Georgia: Strengthening Local and National Capacity and Developing Structured Dialogue"	Leads co-financed activity
		Association Green Alternative	Participates in use case (1)
		ENVSEC project "Enhancing National Capacity on Fire Management and Wildfire Disaster Risk Reduction in the South Caucasus"	Participates in use case (2)
		ENPI East Countries FLEG II Program implemented by the World Bank in partnership with WWF and IUCN	Participates in use case (3,4)
		Caucasus Nature Fund	Participates in use case (4)
		WWF Caucasus and the Critical Ecosystem Partnership Fund (CEPF) a partnership for biodiversity conservation in the Caucasus Ecoregion	Participates in use case (4,6)
		UNDP-GEF Project on Machakhela Protected Area in Adjara	Participates in use case (4)
		Ministry of Environment, Ecology and Forests (MEEF): DGE, DGF, DCC	Executing partner for project implementation in Madagascar; Various DGs co-ordinate and/or participates in use case implementation
		Ministry of Environment, Ecology and Forests (MEEF): Climate Change Department	Coordinated PPG phase; will house project co-ordination unit

⁵⁷ See country reports for additional details re. many of these stakeholders and their roles.

Country / Global	Category of stakeholder	Specific stakeholders ⁵⁷	Association with / participation in project
Madagascar	Government	ONE	Provide data to support the development of project documentation. Provide information on its lessons learned, and expressed its needs as regards the integration of GFW into its work Participates in use cases (3,5,6) Participates in data sharing and validation, etc. (Output 1.1.3)
		State Ministry in charge of Infrastructures, Equipment and Landscape Development	Participates in use cases (5,6,7)
		DGF/SAPM	Participates in use cases (1,6)
		DGF/SGBDF: Forest Database Management Office	Provide data to support the development of project documentation. Provide information on the current status of forest ecosystem in Madagascar Participates in use cases (1,2)
		DGEF/DVRF	Participates in use cases (2,8)
		DGF/DREF	Participates in use cases (1,2,3,4,8)
		DGF/REDD+ Project	Participates in use cases (3)
		MinEnergie and Mines	Participates in use cases (5)
		MinAgri (BVPI-Environmental body)	Participates in use cases (6,7)
		Min water	Participates in use cases (7)
		COBA	Participates in use cases (2,3,4,6,8)
		MNP	Participates in use cases (1,4)
	International donors / projects	UN system / UNDAF	Consultations planned for inception phase to enhance project's contribution to UNDAF goals and objectives
		Project (GIZ – CIRAD – Intercooperation-JICA- USAID)	Participates in use cases (2,4,6,7,8)
		CTD	Participates in use cases (1-7)
		UNDP	Participates in use cases (1,2)
		FAO	Participates in use cases (8)
	NGOs / civil society / Indigenous groups / Women	National Observatory of the Environment and the Forest sector (ONESF)	Provide data; Provide information on its lessons learned, and expressed its needs as regards the integration of GFW into its work
		Association of Networks of Environmental Information Systems (ARSIE)	Provide data; Provide information on its lessons learned, and expressed its needs as regards the integration of GFW into its work
		The Foibe Tao-tsari-tany malagasy	Provide data; Provide information on its lessons learned, and expressed its needs as regards the integration of GFW into its work
		Universities: IOGA (Institut et observatoire de la Geophysique d'Antananarivo), ESSA-Forêts (Ecole Supérieure des Sciences Agronomiques), Faculté des Sciences	Promote research on remote sensing technology and its applicability to the natural resources management, on the applicability of GFW as a tool for monitoring natural resources in Madagascar
		Civil society	Civil society contributes to policy debates and fight against corruption. They are effective advocates for forests and are the ones who can mobilize public opinion on the action against deforestation.
		Indigenous groups : Mikea, Zafimaniry and Tanala	To be consulted and participation sought, particularly through local community groups and in accordance with laws related to 'transfer of management' of forests (Law 96-025). Potential participants in crowd-sourcing pilot work.
		WWF	Participate in use cases (1,2,3,4,6,7)
		WCS	
		CI	
		Fanamby	
		Blue venture	
		GoodPlanet	
		Asity	
		ETC Terra	
		PHCF	

The project will pay particular attention to gender dimensions of forest use and management. It will aim to promote gender equality in terms of access to, and control over, forest resources. This will include supporting and encouraging women's leadership roles in community groups involved in managing forests in the Madagascar pilot. The project will also aim to ensure women's participation in capacity building activities, awareness and use case implementation. Finally, the project's landscape-level demonstrations will include socio-economic assessments, a component of which will consist of gender-based analysis of forest resource use, access, etc. within each pilot landscape.

Section 6: Monitoring and evaluation plan

UNEP will be responsible for managing the mid-term review/evaluation and the terminal evaluation. The Project Manager and partners will participate actively in the process.

The project will be reviewed or evaluated at mid-term. The purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. In addition, it will verify information gathered through the GEF tracking tools.

The project Steering Committee will participate in the MTR or MTE and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented. An MTR is managed by the UNEP Task Manager. An MTE is managed by the Evaluation Office (EO) of UNEP. The EO will determine whether an MTE is required or an MTR is sufficient.

An independent terminal evaluation (TE) will take place at the end of project implementation. The EO will be responsible for the TE and liaise with the UNEP Task Manager throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes:

- (i) to provide evidence of results to meet accountability requirements, and
- (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners.

While a TE should review use of project funds against budget, it would be the role of a financial audit to assess probity (i.e. correctness, integrity etc.) of expenditure and transactions.

The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the EO in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the EO when the report is finalised. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process.

The direct costs of reviews and evaluations will be charged against the project evaluation budget

Section 7: Project Financing and Budget

7.1. Overall project budget

The overall project budget is US\$33,236,465, comprising US\$5,342,465 from GEF and US\$27,894,000 from cofinancing. Details of the budget according to UNEP budget lines are presented in Appendices 1 and 2.

7.2. Project co-financing

A total of US\$27,894,000 has been committed as co-finance. Of this total, \$6,000,000 is in cash and US\$21,894,000 is in kind. **Table 14** below breaks down cofinancing by source, by country/global specificity and by cash vs. in-kind nature.

Table 14: Project co-financing

Name of Co-financier	Country-specific / Global	Total (\$)	Cash (\$)	Kind (\$)
World Resources Institute	Global	6,000,000	6,000,000	---
UNEP/DEPI	Global	300,000		300,000
Transparent World	Global	7,100,000	---	7,100,000
Government of Georgia	Georgia	2,000,000	---	2,000,000
Government of Madagascar	Madagascar	2,500,000	---	2,500,000
GIZ	Georgia	500,000		500,000
ESRI	Global	9,494,000	---	9,494,000
		27,894,000	6,000,000	21,894,000

7.3. Project cost-effectiveness

Among the most significant and transformative aspects of GFW is its ability to redefine the cost effectiveness of forest monitoring efforts. By providing deforestation-based alerts, which can be used to greatly enhance the targeting of forest monitoring efforts, GFW represents a major advance in the application of technology to forest management—one which will inevitably deliver significant cost savings. Evidence of this comes from the case of Brazil, whose experience with use of a precursor national-level, satellite-based system has been credited with major reductions in monitoring cost, together with greatly enhanced effectiveness.

Compared to analogous approaches in which an individual country would ‘start from scratch’, it is estimated that the baseline information and knowledge provided free of charge by the GFW system represents a 50-75% reduction in costs. This represents a first and highly positive example of relative cost effectiveness based on the use of generic global-level information, supported by national-level refinement and validation.

In addition, the cost effectiveness of the GFW-based approach should be evident from the extensive savings in enforcement costs that a data-driven approach enables. Relatively costly site visits can now be preceded and selected based on up-to-date deforestation data and alerts. Depending on country circumstance, this benefit may be expected to reduce monitoring and enforcement costs by 50-75% or more. And this is just one benefit of the system. Others, for example, those associated with enhanced planning due to better data, are also likely to be substantial.

Re. the second issue raised here, GFW follows an open data and open source policy. GFW data is freely accessible for visualization, analysis, and download via the GFW website and open data portal. Furthermore, the GFW website including an open source Application Programming Interface (API) and client libraries, which allows anyone to pull GFW data directly into external websites and databases.

Thus, any country is able to directly access GFW data without negotiating through a third party. This project aims to provide technical support to the governments of Madagascar and Georgia to enable them to validate, enhance, interpret, and apply GFW data (and underlying methods) to local policy issues.

Expanding the enhanced GFW approach to countries around the world has the potential to generate significant environmental economic benefits associated with more sustainable forest management. Together with reduced monitoring costs, this represents a win-win situation of substantial proportions. This will be further enhanced by the development of a sustainable financing plan (see Output 3.1.2) for continued management and improvement of the system.

Appendices

Appendix 1: Budget by project components and UNEP budget lines

1. Overall budget

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW 2.0			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW 2.0 Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
		Georgia	Madagascar	Global										
1000	PROJECT PERSONNEL COMPONENT													
1100	Project Personnel													
1102	Project Management								\$115,433	\$115,433	\$39,247	\$38,093	\$38,093	\$115,433
1103	Various technical and strategic support staff		\$18,802		\$85,463	\$89,348	\$74,586	\$17,614		\$285,813	\$97,176	\$94,318	\$94,318	\$285,813
1199	Sub-total	\$-	\$18,802	\$-	\$85,463	\$89,348	\$74,586	\$17,614	\$115,433	\$401,246	\$136,423	\$132,411	\$132,411	\$401,246
1200	Consultants													
1201	International consultants: Global				\$50,916	\$13,578	\$30,550	\$27,155		\$122,198	\$40,325	\$41,547	\$40,325	\$122,198
1204	International Technical Support: Georgia	\$112,800								\$112,800	\$37,224	\$38,352	\$37,224	\$112,800
1205	International Technical Support: Madagascar		\$122,198							\$122,198	\$40,325	\$41,547	\$40,325	\$122,198
1299	Sub-total	\$112,800	\$122,198	\$-	\$50,916	\$13,578	\$30,550	\$27,155	\$-	\$357,196	\$117,875	\$121,447	\$117,875	\$357,196
1300	Administrative support													
1301	Administrative support													
1399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
1600	Travel on official business (above staff)													
1601	International travel			\$6,069	\$28,323	\$12,409	\$16,185	\$20,231	\$10,810	\$94,026	\$31,029	\$31,969	\$31,029	\$94,026
1602	Domestic travel to demonstration sites			-	-	-	-	-	-	\$-	\$-	\$-	\$-	\$-
1699	Sub-total	\$-	\$-	\$6,069	\$28,323	\$12,409	\$16,185	\$20,231	\$10,810	\$94,026	\$31,029	\$31,969	\$31,029	\$94,026
1999	Component Total	\$112,800	\$141,000	\$6,069	\$164,702	\$115,334	\$121,321	\$65,000	\$126,242	\$852,468	\$285,327	\$285,827	\$281,314	\$852,468
2000	SUB-CONTRACT COMPONENT													
2200	Sub-contracts (MOUs/LAs for supporting organizations)													
2201	Sub-grant: Georgia	\$1,498,420							\$56,214	\$1,554,634	\$513,029	\$528,575	\$513,029	\$1,554,634
2202	Sub-grant: Madagascar		\$1,873,025						\$71,947	\$1,944,972	\$641,841	\$661,290	\$641,841	\$1,944,972
2203	Website & app development contracts			\$86,885	\$75,298		\$143,679			\$305,862	\$100,935	\$103,993	\$100,935	\$305,862
2299	Sub-total	\$1,498,420	\$1,873,025	\$86,885	\$75,298	\$-	\$143,679	\$-	\$128,161	\$3,805,468	\$1,255,804	\$1,293,859	\$1,255,804	\$3,805,468

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW 2.0			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW 2.0 Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
		Georgia	Madagascar	Global										
2299	Component Total	\$1,498,420	\$1,873,025	\$86,885	\$75,298	\$-	\$143,679	\$-	\$128,161	\$3,805,468	\$1,255,804	\$1,293,859	\$1,255,804	\$3,805,468
3000	TRAINING COMPONENT													
3200	Group Training													
3201	Capacity building and outreach: global			-	-	\$73,000	\$60,000	-	-	\$133,000	\$43,890	\$45,220	\$43,890	\$133,000
3299	Sub-total	\$-	\$-	\$-	\$-	\$73,000	\$60,000	\$-	\$-	\$133,000	\$43,890	\$45,220	\$43,890	\$133,000
3300	Meetings/Conferences													
3301	Project Steering Committee meetings: Georgia							\$30,000		\$30,000	\$9,900	\$10,200	\$9,900	\$30,000
3302	Project Steering Committee meetings: Madagascar	-	-	-	-			\$30,000	-	\$30,000	\$9,900	\$10,200	\$9,900	\$30,000
3303	Regional and global meetings and conferences				\$145,222	\$50,000	\$17,904			\$213,126	\$70,332	\$72,463	\$70,332	\$213,126
3399	Sub-total	\$-	\$-	\$-	\$145,222	\$50,000	\$17,904	\$60,000	\$-	\$273,126	\$90,132	\$92,863	\$90,132	\$273,126
3999	Component Total	\$-	\$-	\$-	\$145,222	\$123,000	\$77,904	\$60,000	\$-	\$406,126	\$134,022	\$138,083	\$134,022	\$406,126
4000	EQUIPMENT AND PREMISES COMPONENT													
4100	Expendable equipment													
4101	Office supplies	-	-	-	-	-	-	-	-	\$-	-	-	-	\$-
4199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4200	Non-expendable equipment													
4201	Laptops & portable devices for GFW uploading: Georgia									\$-				
4202	Laptops& portable devices for GFW uploading: Madagascar									\$-	\$-	\$-	\$-	\$-
4299	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4300	Premises													
4301	Rent	-	-	-	-	-	-	-	-	\$-	-	-	-	\$-
4399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4999	Component Total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5000	MISCELLANEOUS COMPONENT													
5100	Operation and maintenance of equipment													
5101	Repair and maintenance	-	-	-	-	-	-	-	-	\$-				\$-
5199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5200	Reporting costs													
5201	Technical reports: Georgia									\$-	\$-	\$-	\$-	\$-
5202	Technical reports: Madagascar									\$-	\$-	\$-	\$-	\$-
5203	Technical reports: Global				\$65,000			\$25,000		\$90,000	\$29,700	\$30,600	\$29,700	\$90,000
5204	Training manuals and toolkits: Global				\$50,000	\$15,000	\$19,000			\$84,000	\$27,720	\$28,560	\$27,720	\$84,000
5299	Sub-total	\$-	\$-	\$-	\$115,000	\$15,000	\$19,000	\$25,000	\$-	\$174,000	\$57,420	\$59,160	\$57,420	\$174,000

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW 2.0			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW 2.0 Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
		Georgia	Madagascar	Global										
5300	Sundry													
5301	Communication									\$-	\$-	\$-	\$-	\$-
5302	Postage									\$-	\$-	\$-	\$-	\$-
5399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5500	Evaluation													
5501	MTR/MTE							\$40,000		\$40,000	\$13,200	\$13,600	\$13,200	\$40,000
5502	Final Evaluation							\$40,000		\$40,000	\$13,200	\$13,600	\$13,200	\$40,000
5503	Audit Report							\$24,403		\$24,403	\$8,053	\$8,297	\$8,053	\$24,403
5599	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$104,403	\$-	\$104,403	\$34,453	\$35,497	\$34,453	\$104,403
5999	Component Total	\$-	\$-	\$-	\$115,000	\$15,000	\$19,000	\$129,403	\$-	\$278,403	\$91,873	\$94,657	\$91,873	\$278,403
TOTAL COSTS		\$1,611,220	\$2,014,025	\$92,954	\$500,222	\$253,334	\$361,904	\$254,403	\$254,403	\$5,342,465	\$1,765,949	\$1,813,502	\$1,763,013	\$5,342,465

2. Georgia sub-grant budget

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL	
		Georgia	Madagascar	Global											
1000	PROJECT PERSONNEL COMPONENT														
1100	Project Personnel														
1101	Georgia	\$100,000								\$18,864	\$118,864	\$40,414	\$39,225	\$39,225	\$118,864
1102	Demonstration component expert (Georgia: Adjara)	\$60,000								\$60,000			\$30,000	\$30,000	\$60,000
1199	Sub-total	\$160,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$18,864	\$178,864	\$40,414	\$69,225	\$69,225	\$178,864
1200	Consultants														
1202	National consultants: Georgia	\$100,000								\$100,000	\$33,000	\$34,000	\$33,000	\$100,000	
1299	Sub-total	\$100,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$100,000	\$33,000	\$34,000	\$33,000	\$100,000	
1300	Administrative support														
1301	Administrative & financial assistant: Georgia									\$60,000	\$60,000	\$19,800	\$20,400	\$19,800	\$60,000
1399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$60,000	\$60,000	\$19,800	\$20,400	\$19,800	\$60,000
1600	Travel on official business (above staff)														
1601	International travel	\$20,000								\$20,000	\$6,600	\$6,800	\$6,600	\$20,000	
1602	Domestic travel to demonstration sites	\$7,220								\$7,220	\$2,383	\$2,455	\$2,383	\$7,220	
1699	Sub-total	\$27,220	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$27,220	\$8,983	\$9,255	\$8,983	\$27,220	
1999	Component Total	\$287,220	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$78,864	\$366,084	\$102,196	\$132,880	\$131,008	\$366,084
2000	SUB-CONTRACT COMPONENT														
2200	Sub-contracts (MOUs/LAs for supporting organizations)														
2201	Use cases: Georgia	\$536,200								\$536,200	\$176,946	\$182,308	\$176,946	\$536,200	
2203	Nationally validated data sets: Georgia	\$265,000								\$265,000	\$87,450	\$90,100	\$87,450	\$265,000	
2205	Demonstration site: Georgia	\$75,000								\$75,000	\$24,750	\$25,500	\$24,750	\$75,000	
2299	Sub-total	\$876,200	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$876,200	\$289,146	\$297,908	\$289,146	\$876,200	
2299	Component Total	\$876,200	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$876,200	\$289,146	\$297,908	\$289,146	\$876,200	
3000	TRAINING COMPONENT														
3200	Group Training														

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
		Georgia	Madagascar	Global										
3201	Capacity building and outreach: Georgia	\$200,000								\$200,000	\$66,000	\$68,000	\$66,000	\$200,000
3299	Sub-total	\$200,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$200,000	\$66,000	\$68,000	\$66,000	\$200,000
3300	Meetings/Conferences													
3301	Inception meeting: Georgia	\$15,000								\$15,000	\$4,950	\$5,100	\$4,950	\$15,000
3303	Technical meetings and workshops: Georgia	\$35,000								\$35,000	\$11,550	\$11,900	\$11,550	\$35,000
3305	Project Steering Committee meetings: Georgia	\$25,000								\$25,000	\$8,250	\$8,500	\$8,250	\$25,000
3399	Sub-total	\$75,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$75,000	\$24,750	\$25,500	\$24,750	\$75,000
3999	Component Total	\$275,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$275,000	\$90,750	\$93,500	\$90,750	\$275,000
4000	EQUIPMENT AND PREMISES COMPONENT													
4100	Expendable equipment													
4101	Office supplies									\$-				\$-
4199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4200	Non-expendable equipment													
4201	Laptops & portable devices for GFW uploading: Georgia	\$25,000								\$25,000				
4299	Sub-total	\$25,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$25,000	\$-	\$-	\$-	\$-
4300	Premises													
4301	Rent									\$-				\$-
4399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4999	Component Total	\$25,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$25,000	\$-	\$-	\$-	\$-
5000	MISCELLANEOUS COMPONENT													
5100	Operation and maintenance of equipment													
5101	Repair and maintenance									\$-				\$-
5199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5200	Reporting costs													
5201	Technical reports: Georgia	\$15,000								\$15,000	\$4,950	\$5,100	\$4,950	\$15,000
5204	Training manuals and toolkits: Georgia	\$20,000								\$20,000	\$6,600	\$6,800	\$6,600	\$20,000
5299	Sub-total	\$35,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$35,000	\$11,550	\$11,900	\$11,550	\$35,000
5300	Sundry													
5301	Communication									\$-	\$-	\$-	\$-	\$-
5302	Postage									\$-	\$-	\$-	\$-	\$-
5399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5500	Evaluation													
5501	MTR/MTE									\$-	\$-	\$-	\$-	\$-

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
		Georgia	Madagascar	Global										
5502	Final Evaluation									\$-	\$-	\$-	\$-	\$-
5503	Audit Report									\$-	\$-	\$-	\$-	\$-
5599	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5999	Component Total	\$35,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$35,000	\$11,550	\$11,900	\$11,550	\$35,000
TOTAL COSTS		\$1,498,420	\$-	\$-	\$-	\$-	\$-	\$-	\$78,864	\$1,577,284	\$493,642	\$536,188	\$522,454	\$1,552,284

3. Madagascar sub-grant budget

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW 2.0			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW 2.0 Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL	
		Georgia	Madagascar	Global											
1000	PROJECT PERSONNEL COMPONENT														
1100	Project Personnel														
1101	National project manager / Senior data expert: Madagascar		\$100,000							\$28,580	\$128,580	\$43,717	\$42,431	\$42,431	\$128,580
1102	Demonstration component expert (Madagascar)		\$60,000								\$60,000		\$30,000	\$30,000	\$60,000
1199	Sub-total	\$-	\$160,000	\$-	\$-	\$-	\$-	\$-	\$-	\$28,580	\$188,580	\$43,717	\$72,431	\$72,431	\$188,580
1200	Consultants														
1201	International consultants: Madagascar										\$-	\$-	\$-	\$-	\$-
1202	National consultants: Madagascar		\$120,000								\$120,000	\$39,600	\$40,800	\$39,600	\$120,000
1299	Sub-total	\$-	\$120,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$120,000	\$39,600	\$40,800	\$39,600	\$120,000
1300	Administrative support														
1302	Administrative & financial assistant: Madagascar									\$70,000	\$70,000	\$23,100	\$23,800	\$23,100	\$70,000
1399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$70,000	\$70,000	\$23,100	\$23,800	\$23,100	\$70,000
1600	Travel on official business (above staff)														
1601	International travel		\$20,000								\$20,000	\$6,600	\$6,800	\$6,600	\$20,000
1602	Domestic travel to demonstration sites		\$7,025								\$7,025	\$2,318	\$2,389	\$2,318	\$7,025
1699	Sub-total	\$-	\$27,025	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$27,025	\$8,918	\$9,189	\$8,918	\$27,025
1999	Component Total	\$-	\$307,025	\$-	\$-	\$-	\$-	\$-	\$-	\$98,580	\$405,605	\$115,335	\$146,220	\$144,050	\$405,605
2000	SUB-CONTRACT COMPONENT														
2200	Sub-contracts (MOUs/LAs for supporting organizations)														
2201	Use cases: Madagascar		\$786,000								\$786,000	\$259,380	\$267,240	\$259,380	\$786,000
2202	Nationally validated data sets: Madagascar		\$325,000								\$325,000	\$107,250	\$110,500	\$107,250	\$325,000
2203	Demonstration site: Madagascar		\$110,000								\$110,000	\$36,300	\$37,400	\$36,300	\$110,000
2299	Sub-total	\$-	\$1,221,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$1,221,000	\$402,930	\$415,140	\$402,930	\$1,221,000
2299	Component Total	\$-	\$1,221,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$1,221,000	\$402,930	\$415,140	\$402,930	\$1,221,000
3000	TRAINING COMPONENT														

UNEP BUDGET LINE/OBJECT OF EXPENDITURE	Component 1 Application and Enhancement of GFW 2.0			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW 2.0 Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
	Georgia	Madagascar	Global										
3200	Group Training												
3201	Capacity building and outreach: Madagascar		\$210,000	-	-	-	-	-	\$210,000	\$69,300	\$71,400	\$69,300	\$210,000
3299	Sub-total	\$-	\$210,000	\$-	\$-	\$-	\$-	\$-	\$210,000	\$69,300	\$71,400	\$69,300	\$210,000
3300	Meetings/Conferences												
3301	Inception meeting: Madagascar		\$15,000						\$15,000	\$4,950	\$5,100	\$4,950	\$15,000
3302	Technical meetings and workshops: Madagascar		\$30,000						\$30,000	\$9,900	\$10,200	\$9,900	\$30,000
3303	Project Steering Committee meetings: Madagascar		\$25,000						\$25,000	\$8,250	\$8,500	\$8,250	\$25,000
3399	Sub-total	\$-	\$70,000	\$-	\$-	\$-	\$-	\$-	\$70,000	\$23,100	\$23,800	\$23,100	\$70,000
3999	Component Total	\$-	\$280,000	\$-	\$-	\$-	\$-	\$-	\$280,000	\$92,400	\$95,200	\$92,400	\$280,000
4000	EQUIPMENT AND PREMISES COMPONENT												
4100	Expendable equipment												
4101	Office supplies								\$-				\$-
4199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4200	Non-expendable equipment												
4202	Laptops& portable devices for GFW uploading: Madagascar		\$30,000						\$30,000	\$9,900	\$10,200	\$9,900	\$30,000
4299	Sub-total	\$-	\$30,000	\$-	\$-	\$-	\$-	\$-	\$30,000	\$9,900	\$10,200	\$9,900	\$30,000
4300	Premises												
4301	Rent								\$-				\$-
4399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4999	Component Total	\$-	\$30,000	\$-	\$-	\$-	\$-	\$-	\$30,000	\$9,900	\$10,200	\$9,900	\$30,000
5000	MISCELLANEOUS COMPONENT												
5100	Operation and maintenance of equipment												
5101	Repair and maintenance								\$-				\$-
5199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5200	Reporting costs												
5201	Technical reports; Madagascar		\$15,000						\$15,000	\$4,950	\$5,100	\$4,950	\$15,000
5202	Training manuals and toolkits: Madagascar		\$20,000						\$20,000	\$6,600	\$6,800	\$6,600	\$20,000
5299	Sub-total	\$-	\$35,000	\$-	\$-	\$-	\$-	\$-	\$35,000	\$11,550	\$11,900	\$11,550	\$35,000
5300	Sundry												
5301	Communication								\$-	\$-	\$-	\$-	\$-
5302	Postage								\$-	\$-	\$-	\$-	\$-
5399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5500	Evaluation												

UNEP BUDGET LINE/OBJECT OF EXPENDITURE		Component 1 Application and Enhancement of GFW 2.0			Component 2 System Uptake and Replication (Global)	Component 3 Strengthening GFW 2.0 Partnerships (Global)	Component 4 Private Sector Application of GFW (Global)	Component 5 Monitoring and Evaluation (All)	Component 6 Project Management (All)	TOTAL	Year 1	Year 2	Year 3	TOTAL
		Georgia	Madagascar	Global										
5501	MTR/MTE													
5502	Final Evaluation													
5503	Audit Report													
5599	Sub-total	\$-	\$-	\$-										
5999	Component Total	\$-	\$35,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$35,000	\$11,550	\$11,900	\$11,550
TOTAL COSTS		\$-	\$1,873,025	\$-	\$-	\$-	\$-	\$-	\$98,580	\$1,971,605	\$632,115	\$678,660	\$660,830	\$1,971,605

Appendix 2: Co-financing by source and UNEP budget lines

UNEP BUDGET LINE		CASH			IN-KIND						
		GEF Trust Fund	Co-Financing WRI	TOTAL CASH	Georgia	Madagascar	GIZ	Co-financing UNEP	ESRI	Transparent World	TOTAL IN-KIND
1000	PROJECT PERSONNEL COMPONENT										
1100	Project Personnel										
1101	Project Manager / Int'l data & GIS expert (Overall and global)	\$163,601		\$163,601							\$-
1102	Technical specialist: Partnerships / private sector	\$130,000		\$130,000							\$-
1106	Technical GFW staff		\$1,813,752	\$1,813,752							\$-
1107	Government in-kind Staff contribution				\$1,000,000	\$1,150,000					\$2,150,000
1108	In-kind Staff Contribution								\$1,000,000		\$1,000,000
1199	Sub-total	\$293,601	\$1,813,752	\$2,107,353	\$1,000,000	\$1,150,000	\$-	\$-	\$1,000,000	\$-	\$3,150,000
1200	Consultants										
1201	International consultants: Global	\$180,000		\$180,000							\$-
1202	National consultants: Georgia	\$-		\$-							\$-
1203	National consultants: Madagascar	\$-		\$-		\$100,000					\$100,000
1204	International Technical Support: Georgia	\$112,800		\$112,800							\$-
1205	International Technical Support: Madagascar	\$141,000		\$141,000							\$-
1206	International Data Management: Georgia						\$200,000				\$200,000
1299	Sub-total	\$433,800	\$-	\$433,800	\$-	\$100,000	\$200,000	\$-	\$-	\$-	\$300,000
1300	Administrative support										
1301	Administrative Staff		\$500,000	\$500,000	\$50,000	\$50,000					\$100,000
1399	Sub-total	\$-	\$500,000	\$500,000	\$50,000	\$50,000	\$-	\$-	\$-	\$-	\$100,000
1600	Travel on official business (above staff)										
1601	International travel	\$116,192		\$116,192							\$-
1602	Domestic travel to demonstration sites	\$10,000		\$10,000	\$50,000	\$50,000					\$100,000
1699	Sub-total	\$126,192	\$-	\$126,192	\$50,000	\$50,000	\$-	\$-	\$-	\$-	\$100,000
1999	Component Total	\$853,593	\$2,313,752	\$3,167,345	\$1,100,000	\$1,350,000	\$200,000	\$-	\$1,000,000	\$-	\$3,650,000
2000	SUB-CONTRACT COMPONENT										
2200	Sub-contracts (MOUs/LAs for supporting organizations)										
2201	Sub-grant: Georgia	\$1,577,284		\$1,577,284							\$-
2202	Sub-grant: Madagascar	\$1,971,605		\$1,971,605							\$-
2203	Website & app development contracts	\$255,454		\$255,454					\$3,994,000		\$3,994,000
2204	Sub-grants: GFW partners		\$3,686,248	\$3,686,248							\$-
2205	Sub-grant: Data Management - Georgia						\$300,000				\$300,000
2299	Sub-total	\$3,804,343	\$3,686,248	\$7,490,591	\$-	\$-	\$300,000	\$-	\$3,994,000	\$-	\$4,294,000
2299	Component Total	\$3,804,343	\$3,686,248	\$7,490,591	\$-	\$-	\$300,000	\$-	\$3,994,000	\$-	\$4,294,000

UNEP BUDGET LINE		CASH			IN-KIND						
		GEF Trust Fund	Co-Financing WRI	TOTAL CASH	Georgia	Madagascar	GIZ	UNEP	ESRI	Transparent World	TOTAL IN-KIND
3000	TRAINING COMPONENT										
3200	Group Training										
3201	Capacity building and outreach: global	\$133,000		\$133,000					\$2,000,000	\$1,000,000	\$3,000,000
3299	Sub-total	\$133,000	\$-	\$133,000	\$-	\$-	\$-	\$-	\$2,000,000	\$1,000,000	\$3,000,000
3300	Meetings/Conferences										
3301	Project Steering Committee meetings: Georgia	\$30,000		\$30,000	\$50,000			\$100,000			\$150,000
3302	Project Steering Committee meetings: Madagascar	\$30,000		\$30,000		\$50,000		\$100,000			\$150,000
3303	Regional and global meetings and conferences	\$213,126		\$213,126				\$100,000			\$100,000
3399	Sub-total	\$273,126	\$-	\$273,126	\$50,000	\$50,000	\$-	\$300,000	\$-	\$-	\$400,000
3999	Component Total	\$406,126	\$-	\$406,126	\$50,000	\$50,000	\$-	\$300,000	\$2,000,000	\$1,000,000	\$3,400,000
4000	EQUIPMENT AND PREMISES COMPONENT										
4100	Expendable equipment										
4101	Office supplies			\$-							\$-
4199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4200	Non-expendable equipment										
4201	GIS Software								\$2,500,000		\$2,500,000
4202	Computers			\$-							\$-
4299	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$2,500,000	\$-	\$2,500,000
4300	Premises										
4301	Office Maintenance, Service & Supplies										\$-
4399	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
4999	Component Total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$2,500,000	\$-	\$2,500,000
5000	MISCELLANEOUS COMPONENT										
5100	Operation and maintenance of equipment										
5101	Repair and maintenance			\$-							\$-
5199	Sub-total	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5200	Reporting costs										
5201	Technical reports: Georgia	\$-		\$-							\$-
5202	Technical reports: Madagascar	\$-		\$-							\$-
5203	Technical reports: Global	\$90,000		\$90,000							\$-
5204	Training manuals and toolkits: Global	\$84,000		\$84,000							\$-
5399	Sub-total	\$174,000	\$-	\$174,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5500	Evaluation										
5501	MTR/MTE	\$40,000		\$40,000							\$-
5502	Final Evaluation	\$40,000		\$40,000							\$-
5503	Audit Report	\$24,403		\$24,403							\$-

UNEP BUDGET LINE		CASH			IN-KIND						TOTAL IN-KIND
		GEF Trust Fund	Co-Financing WRI	TOTAL CASH	Georgia	Madagascar	GIZ	UNEP	ESRI	Transparent World	
5599	Sub-total	\$104,403	\$-	\$104,403	\$-	\$-	\$-	\$-	\$-	\$-	\$-
5600	Miscellaneous / Other	-	-	-	-	-	-	-	-	-	-
5601	Satellite Imagery	-	-	-	-	-	-	-	-	\$6,100,000	\$6,100,000
5603	Direct Forest Management: Georgia	-	-	-	\$850,000	-	-	-	-	-	\$850,000
5604	Direct Forest Management: Madagascar	-	-	-	-	\$1,100,000	-	-	-	-	\$1,100,000
5699	Sub-total	\$-	\$-	\$-	\$850,000	\$1,100,000	\$-	\$-	\$-	\$6,100,000	\$8,050,000
5999	Component Total	\$278,403	\$-	\$278,403	\$850,000	\$1,100,000	\$-	\$-	\$-	\$6,100,000	\$8,050,000
TOTAL COSTS		\$5,342,465	\$6,000,000	\$11,342,465	\$2,000,000	\$2,500,000	\$500,000	\$300,000	\$9,494,000	\$7,100,000	\$21,894,000

Appendix 3: Incremental cost analysis

The incremental costs and benefits of the proposed project are summarized in the following incremental cost matrix. The incremental cost of the project, USD\$28,742,465 is required to achieve the project's global environmental benefits. Of this amount USD\$5,342,465 (representing 19% of the total) is being requested from GEF. The remaining amount of USD\$23,400,000 (81%) of the total cost will come from the Governments of Georgia and Madagascar and other national and international donors. The figure includes both in-kind and cash contributions.

Baseline Scenario (Business As Usual)	GEF Incremental Contribution (what the GEF project will contribute)	Key Outcomes expected with the Alternative Scenario (BAU+GEF Increment)
Component 1. Application and enhancement of GFW in pilot countries GFW Alert System is set-up on a global scale operating different systems: cover change alerts with a resolution of 500 m every monthly in the humid tropics; annual worldwide data operating on 30 m resolution. The resources to enhance the alerts to 250 m and also operating outside the tropics, and to enhance precision in pilot countries, are not yet available	Accuracy and precision of change alerts and annual data of GFW is significantly enhanced in project pilot countries supported by ground truthing and crowdsourcing, and incorporating high resolution datasets specific for these countries. GFW is fully applied in the pilot countries, national professional capacity is developed, and staff is trained on the use of GFW or local developed website that is operational also for off-line use in key agencies. Gathering and reaching consensus on key local datasets for integration into the system, and through this process also identifying and filling critical data gaps. Uniting local land cover and land use data with GFW's global monitoring data will add additional context and help local actors tell a more complete story with the data, which can be used to inform policy decisions and actions. Wide range of stakeholders informed and engaged in the use of GFW as a management and awareness raising tool, from public, private, academic and CSO sectors in the pilot countries.	More precise and accurate land cover and cover change alerts and information operational on a global scale, and applied in selected pilot countries, supporting: (a) improved management of existing forest areas and conservation of biodiversity, (b) reforestation/afforestation programs, and (c) providing the information base for PES schemes (Payment for Ecosystem Services).
Component 2. System uptake and replication GFW suite of tools and platform is set-up on a global scale, however further refinement including development of new tools and applications should be informed by needs and experiences at the country level. Country engagement with GFW is currently limited (Indonesia and Congo Basin).	Experience of enhanced GFW application in pilot countries is well documented and widely disseminated at national and global level, using a wide range of communication tools and involving the broadest range of stakeholders to support rapid uptake and broad use of GFW. Uptake nationally is strong and sustained through concerted communications efforts and direct engagement of many local users with the GFW partners. Improved understanding of country needs from pilot experiences will inform further development of the GFW platform (data, functionality, usability, apps), which will improve the overall local relevance of the platform and encourage further uptake and replication. Additional tailoring and feature development of the GFW global platform based on country needs and experiences will enhance relevance and uptake.	Lessons learned and experience gained in pilot countries support the more rapid and increased utilization of the GFW in other countries and globally, and by a wide range of stakeholders - as a new user-friendly and cost-effective forest information system to support forest conservation. Rates of forest loss and degradation are measurably reduced (<i>ref. table in section A.1.5, and more accurate estimates of greenhouse gas mitigation impacts to be developed during full project proposal preparation in detailed consultation with national experts and stakeholders</i>).
Component 3.	The GEF incremental contribution will	The GFW partnership is

Baseline Scenario (Business As Usual)	GEF Incremental Contribution (what the GEF project will contribute)	Key Outcomes expected with the Alternative Scenario (BAU+GEF Increment)
<p>Strengthening and sustaining the GFW partnership GFW was launched in February 2014. However there is a risk that the partnership is not sufficiently integrated and sustained.</p>	<p>support the timely development and upgrading of GFW partnership to the level of an internationally-accepted, financially self-sufficient, and trusted tool that support enhanced management of forest resources, as well as facilitate reporting to various conventions, bi/multi-lateral partnerships and private sector frameworks such as forest certification, PES schemes, REDD+ MRV, etc.</p>	<p>strengthened, long-term financial sustainability is secured, and GFW is increasingly regarded as a transparent and credible monitoring and management tool in support of forest conservation and sustainable use for at least 10 years to come.</p>
<p>Component 4. Private Sector application to reduce deforestation in supply chains GFW has initiated engagement with private sector companies in the palm oil sector, however it requires additional resources to translate the tools and systems developed for palm oil to additional commodities, thereby increasing relevance to more countries</p>	<p>The GEF increment will specifically support engagement and joint work with private sector, complementing and benefiting from global partnerships. This will generate pilot examples and lessons that will be documented and applied on a global scale, through the GFW partnership.</p>	<p>The national and global impact on forest conservation is significantly enhanced through the adoption of the GFW system as a supply chain management tool by the private sector, and through greater transparency for all of those supply chains and their impacts.</p>

Appendix 4: Results Framework

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
Project objective: Empower decision-makers in government, the private sector, and civil society with technology and information necessary to reduce deforestation and land degradation, combat illegal activities, and conserve biodiversity in pilot countries and on a global scale.	Deforestation rates in target countries.	Georgia: FAO rate (2000-2010): 3000 ha/yr. Hansen rate (accessed via GFW) (2001-2012): 710 ha/yr gross tree cover loss Madagascar: FAO rate (2000-2010): 57,000 ha/yr. Hansen rate (accessed via GFW) (2001-2012): 110,697 ha/yr gross tree cover loss	712,283 t CO ₂ e	1,424,565 CO ₂ e	GFW platform	WRI work might not contribute to forest change immediately or within the life of the program.
	Spatial & temporal coverage (data resolution and frequency) of tree cover loss and gain data	30 meter resolution with annual updates for the entire world. 500 meter resolution with monthly updates for humid tropical forest biomes.	30 meter “as it happens” system 250 meter / monthly for pan-tropics	10 meter / weekly updates for the world. <10 meter resolution on as needed basis for identified priority areas	GFW platform	Risk: Availability and prohibitive cost of satellite imagery Assumption: Technology will continue to advance and become more accessible and affordable
	Number of unique visitors of GFW platform	456,062	800,000	1,100,000	GFW platform	
Component 1: Application and enhancement of GFW globally and in pilot countries						
Outcomes Outcome 1.1: GFW is upgraded and applied on a global scale and in two pilot countries, Madagascar and Georgia, supporting: (a) improved management of existing forest areas and conservation of	<i>Global</i>					
	New / enhanced GFW data sets and global alerts	3 land cover change alert system of various spatial and temporal resolutions, all relying on medium-resolution imagery	Addition of Terra-i system Upgrade of FORMA system to 250 meters As-it-happens Landsat system from UMD Ensemble algorithm combining existing systems	Multi-sensor, multi-input algorithms, integrating high resolution satellite imagery among other data streams.	GFW website, data layers description	
	GFW features and functionality: Crowd-sourcing and related Web 2.0 features	Minimal crowd-sourcing functionality Limited analytical tools	Mobile app enabling people on the ground to access and submit data to GFW	At least 3 unique crowdsourcing applications At least 8 specialized	GFW Platform, website analytics, user surveys	Identification of incentives to encourage wide participation in and contribution to the

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
biodiversity, (b) reforestation/afforestation programmes, (c) improved control of deforestation on the ground and monitoring / protection of carbon stocks and (d) providing the information base for PES schemes (Payment for Ecosystem Services).			Tailored analytical tools through specialized apps for commodities, biodiversity, and climate	apps for conducting customized analysis		GFW platform.
	Number of datasets integrated within GFW website	61	91	106	GFW platform	Lack of transparency and data disclosure by governments and companies
	<i>Pilot countries</i>					
	Widespread and easy availability of nationally validated data sets of highly relevant to sustainable forest management	GFW has made historic and near-real time information on forest cover change widely and easily accessible, but at a resolution that is not sufficient to track deforestation in certain forest types or degradation	Use of higher resolution data has been demonstrated in pilot countries and integrated within national forest geo-portals	Pilot countries decide on protocols and systems for acquisition and use of higher resolution satellite data for forest management		
		Country-specific datasets are scattered and mostly unavailable	Identification of existing relevant data sets and progress towards making them available	Forest geo-portals make available national data sets in conjunction with and connected to GFW global system		
	Forest and land use management practices across multiple land use types	Information about forest cover and associated change is poorly utilized in areas such as protected areas management, fire control	Entry points for use of GFW data have been identified for multiple management processes	Routine use of GFW data within multiple management processes	Project reports	
	Awareness and capacity levels	Limited awareness of GFW system	Increasing awareness and use in management	Widespread awareness and use in management	Project reports	

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
<p>Output 1.1.1 Improved global- and regional-level data on GFW platform</p> <p>Output 1.1.2 Improved features and functionality on GFW global platform to support analysis, decision-making and action</p> <p>Output 1.1.3 Nationally validated data sets, including refined forest cover / change data and additional locally generated data layers, are available within pilot country sections of GFW</p> <p>Output 1.1.4 Enhanced management practices through national and field-level application ('use cases') of data and information generated and made available through national GFW views</p> <p>Output 1.1.5 Targeted awareness, capacity building and outreach effort focusing on governmental and non-governmental stakeholders in the pilot countries to support timely and wide-ranging system uptake</p>						

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
Outcome 1.2: Government and non-government agencies in pilot countries adopt GFW as a critical information tool for collaborating on landscape-level, multi-sectoral initiatives	Integration of forest biodiversity, carbon and land degradation considerations within landscape-level planning and management	Little or no experience integrating biodiversity, carbon and land degradation considerations into land use planning, zoning and/or management at any level (landscape or otherwise)	One large-scale landscape (> 1 million ha) in each pilot country has begun to integrate GFW as a tool for inter-sectoral co-operation and planning	One large-scale landscape (> 1 million ha) in each pilot country has completed a planning exercise using GFW as a tool for inter-sectoral co-operation and planning	Project reports	
Output 1.2.1 GFW demonstrated as a tool for integrating multiple biodiversity, carbon and land degradation considerations in support of landscape-level planning and management.						
Component 2: System uptake and replication						
Outcome 2.1: National-level users in multiple countries have enhanced opportunity to visualize and utilize country-specific data	National-level enrichment of GFW platform	Limited ability to access and view national-level data	GFW platform has been partly enhanced to optimize national-level uses	Full range of enhancements optimize national-level uses	GFW platform	
Output 2.1.1 Enhanced online GFW system to visualise and enable interpretation of country-relevant data.						
Outcome 2.2 Lessons learned and experience gained in target countries support the enhancement of the GFW platform to increase its relevance and utilization at scale	Level of uptake / use in target countries	Awareness of and use of GFW in target countries is extremely limited 617 unique visitors from Madagascar, 635 from Georgia	100% increase in access to GFW site from target countries 5 analytic cases produced in each country	200% increase in access to GFW site from target countries 10 analytic cases produced in each country	GFW platform use statistics	

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
by a range of stakeholders						
Output 2.2.1 Enhanced GFW uptake in target and other countries						
Output 2.2.2 Country-level and thematic analyses and sharing of lessons learned through implementation of use cases and other country-level co-operation						
Output 2.2.3 Policy and programme guidance based on GFW lessons learned						
Component 3: Strengthening and sustaining the GFW partnership						
Outcome 3.1 The GFW partnership is strengthened, long-term financial sustainability is secured, and GFW is increasingly regarded as a transparent and credible monitoring and management tool in support of forest conservation and sustainable use	Breadth of GFW membership	High percentage of western donors, companies	Increasingly broad membership	Membership of the GFW is broad, diverse, and effective for achieving GFW's objectives.	Partners' meeting reports	
	Sustainable financing of GFW	No plan	Plan is under discussion, with several underlying studies implemented	Plan is adopted by majority of GFW Partners	Partners' meeting report	
Output 3.1.1 Country-, regional- and global-level user networks established and strengthened						
Output 3.1.2 Sustainable financing plan for the						

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
<p>GFW system developed in collaboration with public and private sector as well as CSOs</p> <p>Output 3.1.3 External and independent review and oversight mechanism established to guarantee highest degree of transparency and technical credibility</p>						
Component 4: Private sector application to reduce deforestation in key commodity sector supply chains						
Outcome 4.1: National and global-level impacts of GFW on forest conservation are significantly enhanced through the adoption of the suite of tools/platforms as a supply chain management tool by the private sector	Number of GFW-Commodities endorsements or recommendations made by target commodity sector leverage points (e.g. TFA2020, CGF, RSPO)	0	5	10	Project reports	Assumption: Private sector will view GFW Commodities as an unbiased source of information and do not attempt to undermine its validity as such
	Number of private sector entities that have used GEF to improve their capacity to eliminate deforestation from their commodity supply chains	0	15	25	Project reports and associated surveys	
	Number of corporate standards, strategies, plans, or regulations addressing deforestation or compliance with sustainability commitments officially proposed, adopted, or implemented as a result of GFW	0	3	6	Project reports and associated surveys	

Project Strategy	Indicators	Baseline	Mid Term Targets	End of Project Targets	Sources of Verification	Risk and Assumptions
	assistance					
Output 4.1.1 Partnerships with selected private sector companies active in target commodity sectors in target countries and/or globally, to assess user needs and requirements and jointly explore the development of GFW-specific decision-support tools tailored to private sector operations, management systems, and covering various steps in commodity supply chains						
Output 4.1.2. An expanded and improved GFW Commodities application or suite of applications, providing enhanced datasets and management tools for companies trading in goods and services linked to deforestation						
Output 4.1.3 Broad, rapid uptake of GFW Commodities applications through partnership networks and specific promotion efforts.						

Appendix 5: Workplan and timetable

ACTIVITY	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
COMPONENT 1 – APPLICATION AND ENHANCEMENT OF GFW GLOBALLY AND IN PILOT COUNTRIES												
Outcome 1.1 - GFW is upgraded and applied on a global scale and in two pilot countries, Madagascar and Georgia, supporting: (a) improved management of existing forest areas and conservation of biodiversity, (b) reforestation/ afforestation programmes, (c) improved control of deforestation on the ground and monitoring / protection of carbon stocks and (d) providing the information base for PES schemes (Payment for Ecosystem Services).												
<i>Output 1.1.1 – Improved global- and regional-level data on GFW platform</i>												
Activity 1.1.1.1 Terra-i pan-tropical expansion of land cover change alerts system (originally developed for Latin America), with first version ready in 2015												
Activity 1.1.1.2 Increased resolution of FORMA alerts from 500 to 250 m for pan tropics												
Activity 1.1.1.3 Annual (2013-2016) updates of global tree cover change from UMD												
Activity 1.1.1.4 Thirty meter Landsat alert system from UMD												
Activity 1.1.1.5 Targeted use of high resolution satellite imagery (sub 10 m) based on hotspot identification supported by medium-resolution systems												
Activity 1.1.1.6 Addition of new global data sets, e.g. plantations, carbon												
<i>Output 1.1.2 - Improved features and functionality on GFW global platform to support analysis, decision-making and action</i>												
Activity 1.1.2.1 Improvement and/or addition of new analytical tools allowing users to interpret data on-the-fly to support decision-making												
Activity 1.1.2.2 Enhancement of user interface to make data more discoverable, understandable, and immediately relevant for multiple audiences												
Activity 1.1.2.3 New tools for crowdsourcing and user participation, including submission of ground-based information												
Activity 1.1.2.4 Optimization of the website and related apps for mobile phones												
Activity 1.1.2.5 New options for offline access to GFW data and analytical tools												
<i>Output 1.1.3 - Nationally validated data sets, including refined forest cover / change data and additional locally generated data layers, are available within pilot country sections of GFW and on national forest geoportals</i>												
Activity 1.1.3.1 Use validation and ground-truthing methods to ensure accuracy of GFW reporting of tree cover loss												
Activity 1.1.3.2 Integrate (obtain, review, validate, digitize if necessary, format and upload) additional pilot country data sets												
Activity 1.1.3.3 Select and acquire higher resolution data												

ACTIVITY	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 1.1.3.4 Combined GFW global and national data sets constitute pilot country forest geoportals												
<i>Output 1.1.4 - Enhanced management practices through national and field-level application ('use cases') of data and information generated and made available through national GFW views</i>												
Activity 1.1.4.1 Establishment of use case implementation groups for identified cases												
Activity 1.1.4.2 Groups finalize use case details, including budgets; national-level steering committees approve												
Activity 1.1.4.3 Use cases are implemented												
Activity 1.1.4.4 Use case lessons are captured and shared nationally and internationally												
Activity 1.1.4.5 Additional use cases are solicited, approved and implemented												
<i>Output 1.1.5 - Targeted awareness, capacity building and outreach effort focusing on governmental and non-governmental stakeholders in the pilot countries to support timely and wide-ranging system uptake</i>												
Activity 1.1.5.1 National and local-level workshops will introduce key stakeholders to GFW and further assess analytical needs												
Activity 1.1.5.2 Implement targeted program of institutional and human capacity building												
Activity 1.1.5.3 Collaboration with universities, schools, NGOs, donors and media will serve to increase knowledge about forests and to support national-level efforts to generate and publish value-added, GFW-based analyses												
Outcome 1.2 - Government and non-government agencies in pilot countries adopt GFW as a critical information tool for collaborating on landscape-level, multi-sectoral initiatives												
<i>Output 1.2.1 - GFW demonstrated as a tool for integrating multiple biodiversity, carbon and land degradation considerations in support of landscape-level planning and management</i>												
Activity 1.2.1.1 Detailed correlation of complete set of use cases to demonstration areas, together with associated capacity building needs												
Activity 1.2.1.2 Establish inter-sectoral committees												
Activity 1.2.1.3 Identify higher resolution data needs and acquire data sets												
Activity 1.2.1.4 Implement capacity building measures												
Activity 1.2.1.5 Use case implementation												
Activity 1.2.1.6 Apply emerging findings within landscape-level planning exercise												
COMPONENT 2 – SYSTEM UPTAKE AND REPLICATION												
Outcome 2.1 National-level users in multiple countries have enhanced opportunity to visualize and utilize country-specific data												
<i>Output 2.1.1 Enhanced online GFW system to visualise and enable interpretation of country-relevant data</i>												

ACTIVITY	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 2.1.1.1 Improved interfaces to access and view national data sets, e.g. land cover, land use, forest type												
Activity 2.1.1.2 Upgraded country pages developed in collaboration with FAO and coinciding with the launch of the Global Forest Resources Assessment 2015												
Activity 2.1.1.3 Ongoing user surveys and feedback analyzed to inform interface improvements and web development priorities												
Activity 2.1.1.4 Structured user testing of new features and functionalities to enable development												
Activity 2.1.1.5 Improved web-based translation systems, user manuals in multiple languages and additional language-related options												
Activity 2.1.1.6 Tailored GFW apps developed to address monitoring needs related to key international policy commitments, e.g. monitoring national progress towards CBD Aichi targets, setting reference levels for REDD+, etc.												
Activity 2.1.1.7 Online training materials, such as sample analyses, examples and webinars												
Outcome 2.2 Lessons learned and experience gained in target countries support the enhancement of the GFW platform to increase its relevance and utilization at scale by a range of stakeholders												
<i>Output 2.2.1 – Enhanced GFW uptake in target and other countries</i>												
Activity 2.1.2.1 In-country efforts, including workshops and support to documentation in local newspapers, etc												
Activity 2.1.2.2 Support country participation in sub-regional, regional- and thematic-level workshops												
<i>Output 2.2.2 - Country-level and thematic analyses of lessons learned through implementation of use cases and other country-level</i>												
Activity 2.2.2.1 Analyse GFW uptake within not only GEF pilot countries (Georgia and Madagascar) but also within other countries where GFW uptake is being targeted (see 2.2.1 above).												
Activity 2.2.2.2 Thematic, multi-country analyses assess and attempt to quantify the specific management contexts (protected areas management, community forest management, etc.) within which GFW is having impacts, as well as techniques for using GFW effectively to identify and address drivers of deforestation and forest degradation, strengthen governance, etc.												
Activity 2.2.2.3 Success stories, as well as persisting barriers, are identified and shared at regional and thematic workshops, training courses and online.												
Activity 2.2.2.4 Lessons learned feed back iteratively into further enhancements to GFW, including tool development to address cross-cutting challenges, bottlenecks, and barriers to uptake												
<i>Output 2.2.3 Policy and programme guidance based on GFW lessons learned</i>												
Activity 2.2.3.1 Develop guidelines for national governments related to the use of remote sensing and associated data and information for enhanced forest and land use management, as well as the utility of apps aiming to support countries in monitoring international commitments related to CBD Aichi targets, REDD+, etc.												
Activity 2.2.3.2 Produce policy papers based on results of 2.2.3.1												

ACTIVITY	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 2.2.3.3 Disseminate findings to governments, CBD, UNFCCC, UNCCD, CSOs and the private sector												
COMPONENT 3 – STRENGTHENING AND SUSTAINING THE GFW PARTNERSHIP												
Outcome 3.1 The GFW partnership is strengthened, long-term financial sustainability is secured, and GFW is increasingly regarded as a transparent and credible monitoring and management tool in support of forest conservation and sustainable use												
<i>Output 3.1.1 - Country-, regional- and global-level user networks established and strengthened</i>												
Activity 3.1.1.1 Support to national- and local-level networks engaging governmental, academic, indigenous people's, women's and civil society representatives to stimulate and enhance the use of GFW for improved forest management												
Activity 3.1.1.2 Ensuring partner country level representation in the Partnership												
Activity 3.1.1.3 Development and maintenance of a user contact database												
Activity 3.1.1.4 Creation of an online discussion forum, user profiles and other social networking tools to enable communication, lesson sharing, and collaboration across national, regional and global user networks												
Activity 3.1.1.5 Recruitment of new GFW Partners												
Activity 3.1.1.6 Creation of MOUs and partnership agreements as necessary												
Activity 3.1.1.7 Regular communications to the GFW Partnership (e.g. via email newsletters, the GFW Partner website, bilateral discussions), including updates on key activities and outcomes and soliciting input on key challenges												
Activity 3.1.1.8 Annual in-person meetings of the GFW Partners and Advisors, potentially including global and regional gatherings												
<i>Output 3.1.2 - Sustainable financing plan for the GFW system developed in collaboration with public and private sector as well as CSOs</i>												
Activity 3.1.2.1 Assessment of cost-saving benefits of GFW for key user groups, enabled through low-cost access to data and tools and increased efficiency of operations												
Activity 3.1.2.2 Assessment of opportunities to minimize costs associated with data and platform maintenance												
Activity 3.1.2.3 Recruitment of additional private sector partners, especially from technology sectors, to provide in-kind contributions to reduce costs (e.g. free cloud computing services from Google)												
Activity 3.1.2.4 Ongoing monitoring, evaluation, and documentation of outcomes and success stories to share with existing and prospective funders and stakeholders												
Activity 3.1.2.5 Enhancement of the GFW API and other open source tools (see Output 1.1.2) to allow GFW partners and users to build on the core platform to generate new apps and tools to address their own needs, thereby spreading development costs among a broader network of users												
<i>Output 3.1.3 - External and independent review and oversight mechanism established to guarantee highest degree of transparency and technical credibility</i>												

ACTIVITY	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 3.1.3.1 Establish global technical advisory committee to ensure operational transparency and effective management, especially in regards to the latest remote sensing information, algorithms and needed computing power and long-term sustainability of the initiative												
Activity 3.1.3.2 Technical committees (subsets of the GFW Advisory Group) will address specific technical challenges related to data and will be involved in the development of articles to scientific journals documenting methodologies for key GFW datasets.												
Activity 3.1.3.3 Put forward open and regularly updated communications regarding known uncertainty levels and limitations related to specific data available via the GFW website.												
Activity 3.1.3.4 Workshops to convene data scientists and relevant stakeholders to address questions and concerns about specific datasets and associated methodologies												
COMPONENT 4 – PRIVATE SECTOR APPLICATION TO REDUCE DEFORESTATION IN SUPPLY CHAINS												
<i>Outcome 4.1 National and global-level impacts of GFW on forest conservation are significantly enhanced through the adoption of the suite of tools/platforms as a supply chain management tool by the private sector</i>												
<i>Output 4.1.1 Partnership established with selected private sector companies active in pilot countries and/or globally, to assess user needs and requirements, and jointly explore the development of GFW Specific Decision-Support tools tailored to PS operations, management systems, and covering various steps in range of commodity supply chains</i>												
Activity 4.1.1.1 Develop formal partnership agreements with select companies demonstrating high commitment to reducing impacts on forests and playing a major role in specific commodity supply chains.												
Activity 4.1.1.2 Work closely with partner companies to identify and prioritize goals, data and analytical needs, and critical data gaps for monitoring and reporting on supply chain sustainability												
Activity 4.1.1.3 Develop data-sharing partnerships to enable presentation of the highest quality and most comprehensive information available about commodity production and supply chain systems												
<i>Output 4.1.2. Specific management tools for investors and private companies trading in forest ecosystem services and goods are developed</i>												
Activity 4.1.2.1 Develop tools for supply chain companies												
Activity 4.1.2.2 Develop tools for commodity standards systems												
Activity 4.1.2.3 Develop tools that enable people and companies to contribute data and stories from the ground												
Activity 4.1.2.4 Develop tools that help NGOs and other stakeholders to lobby governments, growers, traders, certification schemes, and other supply chain actors												
<i>Output 4.1.3 GFW tools for private sector widely promoted within private sector's relevant conventions and specific communication channels, supporting rapid global uptake</i>												
Activity 4.1.3.1 Use GFW's emerging global partnerships to accelerate uptake by local subsidiaries, joint-venture partners, and												

ACTIVITY	YEAR 1				YEAR 2				YEAR 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
suppliers of agricultural products linked with deforestation and forest degradation												
Activity 4.1.3.2 Participate in relevant multi-stakeholder and international fora to help build consensus around, and commitment to, a vision for sustainable commodities production												
Activity 4.1.3.3 Engage with target country governments and other stakeholders, using GFW Commodities as a fulcrum around which to focus relevant policy discussions												

Appendix 6: Key deliverables and benchmarks

Outputs	Country / Global	Deliverables	Benchmarks
1.1.1 Improved global- and regional-level data on GFW platform	Global	<ul style="list-style-type: none"> • Terra-I pan-tropical expansion of their forest cover change alerts system (originally developed for Amazon); first version ready in 2015 • Improved resolution of FORMA Alerts from 500 to 250 m for pan tropics • Annual updates of global tree cover change from UMD (2013-2016) • Thirty meter Landsat alert system by UMD • Targeted use of high resolution imagery based on hotspot identification • Addition of new global data sets, e.g. carbon, plantations 	<ul style="list-style-type: none"> • New data sets are available on GFW website and being used
1.1.2 Improved features and functionality on GFW global platform to support analysis, decision-making and action	Global	<ul style="list-style-type: none"> • Improved / new analytical tools • Improved user interface to make data more discoverable, understandable, and immediately relevant for multiple audiences • New tools for crowdsourcing and user participation, including submission of ground-based information 	<ul style="list-style-type: none"> • New features in use on the GFW website
1.1.3 Nationally validated data sets, including refined forest cover / change data and additional locally generated data layers, are available within national views of global GFW site and on national forest geoportals	Georgia	<ul style="list-style-type: none"> • Validated national-level data sets • Filling of critical data gaps, including acquisition of 5 m. resolution satellite data for entire forest area of Georgia (3.5 million ha) for two time steps to validate forest cover change data • National forest geo-portal, incorporating datasets / layers considered important by national stakeholders 	<ul style="list-style-type: none"> • Forest geo-portal is up and running
	Madagascar	<ul style="list-style-type: none"> • Validated national data sets • Filling of critical data gaps, including acquisition of high-resolution satellite data for northwest region of Madagascar (x million ha) for two time steps to validate forest cover change data • National forest geo-portal, incorporating datasets / layers considered important by national stakeholders 	<ul style="list-style-type: none"> • Forest geo-portal is up and running

Outputs	Country / Global	Deliverables	Benchmarks
1.1.4 Enhanced management practices through national and field-level application ('use cases') of data and information generated and made available through national GFW views	Georgia	<ul style="list-style-type: none"> Implementation of use cases in, <i>inter alia</i>, the following areas: management of production forests, forest fire alert systems, forest assessment and inventories, protected areas management, forest carbon stock analysis and strategy, reforestation 	<ul style="list-style-type: none"> Final use case reports, including quantified impact assessments
	Madagascar	<ul style="list-style-type: none"> Implementation of use cases in, <i>inter alia</i>, the following areas: protected areas management, community forest management, REDD+, mangrove management, mining, EIA, watershed management, production forest management 	<ul style="list-style-type: none"> Final use case reports, including quantified impact assessments
1.1.5 Targeted awareness, capacity building and outreach effort focusing on governmental and non-governmental stakeholders in the pilot countries to support timely and wide-ranging system uptake	Georgia	<ul style="list-style-type: none"> National and local-level workshops introduce stakeholders to GFW and assess analytic needs Build institutional and human capacities to use GFW to enhance forest management, reduce deforestation and conserve biodiversity and carbon stocks Outreach, awareness raising and participation (including involving local people from existing governmental and NGO networks) through upload features/crowd-sourcing, media roundtables and landscape-level initiatives Collaboration with universities, NGOs, donors and media to increase knowledge and develop GFW-based analyses 	<ul style="list-style-type: none"> GFW-based analyses
	Madagascar	<ul style="list-style-type: none"> National and local-level workshops introduce stakeholders to GFW and assess analytic needs Build institutional and human capacities to use GFW to enhance forest management, reduce deforestation and conserve biodiversity and carbon stocks Outreach, awareness raising and participation (including involving local people from existing governmental and NGO networks) through upload features/crowd-sourcing, media roundtables and landscape-level initiatives Collaboration with universities, NGOs, donors and media to increase knowledge and develop GFW-based analyses 	<ul style="list-style-type: none"> GFW-based analyses

Outputs	Country / Global	Deliverables	Benchmarks
1.2.1 GFW demonstrated as a tool for integrating multiple biodiversity, carbon and land degradation considerations in support of landscape-level planning and management	Georgia	<ul style="list-style-type: none"> Specific landscape-level enhancements to GFW useful for implementation of the demonstration are identified and developed GFW analyses from multiple use case areas (production forest management, fire alerts, forest assessment, PA management, carbon and reforestation) are used to develop integrated landscape-level forest and land use management strategy in Adjara Autonomous region 	<ul style="list-style-type: none"> NA
	Madagascar	<ul style="list-style-type: none"> Specific GFW-based analyses—including those based on higher resolution data, as needed—prepared concerning pilot landscape (North-West) <p>Analyses are used to ensure mainstreaming of biodiversity and carbon considerations into land use planning within the target landscape</p>	<ul style="list-style-type: none"> NA
2.1.1 Enhanced online GFW system to visualise and enable interpretation of country-relevant data	Global	<ul style="list-style-type: none"> Collaborate with local experts, researchers, and universities analyzing forest cover change within local contexts to better understand impacts of forest policies 	<ul style="list-style-type: none"> NA
2.2.1 – Enhanced GFW uptake in target and other countries	Global	<ul style="list-style-type: none"> National and local civil society participation encouraged through hub-and-spoke collaboration and South-to-South cooperation increased through regional and thematic symposia 	<ul style="list-style-type: none"> NA
2.2.2 - Country-level and thematic analyses of lessons learned through implementation of use cases and other country-level	Global	<ul style="list-style-type: none"> Collect lessons learned from use cases in GEF pilot countries and countries where GFW is actively engaged; lessons learned will include success stories and how GFW platform should incorporate national-level data 	<ul style="list-style-type: none"> NA
3.1.1 - Country-, regional- and global-level user networks established and strengthened	Global	<ul style="list-style-type: none"> In-country networks developed involving nonprofit organizations and governments 	<ul style="list-style-type: none"> NA
3.1.2 Sustainable financing plan for the GFW system developed in collaboration with public and private sectors, as well as civil society	Global	<ul style="list-style-type: none"> Studies demonstrate cost effectiveness of GFW-based effort including for monitoring and targeting enforcement Examine new approaches to cost effective maintenance of the system Encourage country- and private sector financing of national and thematic system components 	<ul style="list-style-type: none"> Completed financing plan

Appendix 7: Costed M&E plan

The monitoring and evaluation process is expected to be a key component of each outcome area, within the project, based on a three-year implementation plan. Monitoring and Evaluation (M&E) will be conducted utilising the results-based management approach. The Results Framework provides performance and impact indicators for project implementation along with corresponding means of verification. M&E will be an on-going process and is based on the following strategic directions:

- An effective coordinating mechanism with roles and responsibilities clearly defined and under the aegis of World Resources Institute (WRI), which has lead responsibility for overall project execution.
- The monitoring and evaluation process is participatory, consultative and aimed at ensuring delivery of project outputs and achievement of associated defined targets. Evaluation will be based on the status of implementation, through identification of gaps, and the measurement of impacts and level of success in the application of best practices.

UNEP will be responsible for managing the mid-term review/evaluation and the terminal evaluation. The Project Manager and partners will participate actively in the process.

The project will be reviewed or evaluated at mid-term. The purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to provide an independent assessment of project performance at mid-term, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. In addition, it will verify information gathered through the GEF tracking tools.

The project Steering Committee will participate in the MTR or MTE and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented. An MTR is managed by the UNEP Task Manager. An MTE is managed by the Evaluation Office (EO) of UNEP. The EO will determine whether an MTE is required or an MTR is sufficient.

An independent terminal evaluation (TE) will take place at the end of project implementation. The EO will be responsible for the TE and liaise with the UNEP Task Manager throughout the process. The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes:

- i. to provide evidence of results to meet accountability requirements, and
- ii. to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP and executing partners.

While a TE should review use of project funds against budget, it would be the role of a financial audit to assess probity (i.e. correctness, integrity etc.) of expenditure and transactions.

The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the EO in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six point rating scheme. The final determination of project ratings will be made by the EO when the report is finalised. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process.

The direct costs of reviews and evaluations will be charged against the project evaluation budget.

The M&E plan includes an inception workshop and report, project implementation reviews, quarterly and annual review reports, and mid-term and final evaluations. The following sections outline the principal components of the M&E plan and M&E activities. The M&E plan for the project will be presented and finalized in an Inception report following a collective fine-tuning of indicators, means of verification, and the full definition of implementation arrangements related to executing partners and project staff.

The indicative Monitoring and Evaluation Work Plan is provided in Table 1 below.

Table 1: Indicative Monitoring and Evaluation Work Plan

Type of M&E Activity	Responsible Parties	Time Frame	Costing
Project Inception Workshop and Report	<ul style="list-style-type: none"> National Project Director Project Coordinator/PCU UNEP 	Within first two months of Project start up	Total: \$30,000
Measurement of Means of Verification of Project results (outcome indicators and GEF tracking tools, including baseline data)	<ul style="list-style-type: none"> Project Steering Committee / National Project Director will oversee the hiring of specific studies and institutions/ agencies, and delegate responsibilities to relevant executing partners and /or Project Technical Committee members National Project Director Project Coordinator PIU 	Start, mid and end of Project (during evaluation cycle); and annually.	Total: \$25,000
Measurement of Means of Verification for Project Progress (progress and performance indicators)	<ul style="list-style-type: none"> Oversight by National Project Director Project Coordinator PSC and IPTC 	Annually prior to ARR/PIR and as defined in annual work plans	Total: \$20,000
Annual Risk Review (ARR) and Project Implementation Report (PIR)	<ul style="list-style-type: none"> Project Director Project Coordinator PSC/ 	Annually	None
Periodic Status/Progress Reports to UNEP	<ul style="list-style-type: none"> National Project Director Project Coordinator 	Semi-annual/Quarterly	None
Project Steering Committee (PSC) meetings	<ul style="list-style-type: none"> National Project Director Project Coordinator PSC members UNEP (annually) 	Annually	Total: \$45,000
Reports of PSC meetings	<ul style="list-style-type: none"> National Project Director Project Coordinator 	Semi-annually	None
MTR/MTE'	<ul style="list-style-type: none"> National Project Director PSC UNEP Task Manager National and External Consultants 	At the mid-point of Project implementation	Total: \$40,000
Terminal Evaluation	<ul style="list-style-type: none"> UNEP Evaluation Office National Project Director PSC UNEP Task Manager External Consultants (i.e. evaluation team) 	At least 3 months before the end of Project implementation	Total: \$40,000
Audits	<ul style="list-style-type: none"> Government Accounting Department National Project Director Project Executing Agency 	Annually	Total: \$10,000
Project Final Report	<ul style="list-style-type: none"> National Project Director Project Coordinator PSC 	Within 2 months of Project completion	None
Co-Financing Report	<ul style="list-style-type: none"> National Project Director Project Coordinator PSC 	Within 1 month of PIR reporting period	None
Field Visits	<ul style="list-style-type: none"> National Project Director 	As appropriate	Total: \$20,000

Type of M&E Activity	Responsible Parties	Time Frame	Costing
	<ul style="list-style-type: none"> • Project Coordinator • PSC • Representatives of Executing partners • UNEP 		
Publications of Lessons Learned and other Project Documents	<ul style="list-style-type: none"> • National Project Director • Project Coordinator • Project Executing Agency 	Annually, part of semi-annual reports and Project Final Report	Total: \$20,000
Total M&E Plan Cost			\$250,000

The key indicators according to which M&E will take place are presented in the results framework (Annex 4).

A Project Inception Workshop (IW) will be held within the first three (3) months of start-up with the PCU, Project Steering Committee (PSC), UNEP, WRI, country-level executing partners and other implementation partners, and co-financing partners, as appropriate. A fundamental objective of this IW will be to help the project implementation partners to renew and elaborate commitment to the project goal and objectives, as well as to finalize preparation of the first annual work plan on the basis of the results framework. This will include reviewing the results framework (indicators, means of verification, and assumptions), adding additional detail as needed, and on the basis of this exercise, drafting the Annual Work Plan (AWP) with more precise and measurable performance indicators, and in a manner consistent with the expected Project outcomes. The workshop will also be used to define specific targets that are aligned to BD, SFM, and SLM Tracking Tools and for the first-year implementation progress indicators, together with their means of verification.

Day-to-day monitoring of implementation progress will be the responsibility of the National Project Coordinator based on the project's AWP and its indicators. The National Project Coordinator will inform the UNEP-GEF and the Lead Executing Partner of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion. The National Project Coordinator will fine-tune the progress and performance/impact indicators of the Project in consultation with the IPTC, as well as develop specific targets for the first-year implementation progress indicators together with their means of verification. These will be used to assess whether implementation is proceeding at the intended rate and in the right direction and will form part of the AWP. Targets and indicators for subsequent years will be defined annually as part of the internal evaluation and planning processes undertaken by the PCU.

Periodic monitoring of implementation progress will be undertaken by the PSC through quarterly meetings of the PSC, IPTC, Lead Implementation Agency and the PIU, or more frequently as deemed necessary. This will allow parties to take stock of and to troubleshoot any problems pertaining to the Project in a timely fashion to ensure the timely implementation of activities. The PIU under the guidance of the PSC, and in conjunction with other members of the IPTC, will, as appropriate, conduct yearly field visits to assess the impact of implementation on the ground, particularly with regard to the tangible interventions. Field Visit Reports will be prepared by PIU, and circulated no less than one month after the visit(s).

Annual monitoring will occur through the PSC Reviews. The Project will be subject to reviews by the PSC at least once every year. The first such meeting will be held within the first twelve (12) months of the start of full implementation. The National Project Coordinator will prepare an Annual Project Report (APR) and submit it to PSC at least two weeks prior to the review, for the review and comments of the PSC/IPTC.

The Terminal Review will be held in the last month before the Project National Project Coordinator is responsible for preparing the Terminal Report and submitting it to the PSC. It shall be prepared in draft at least two months in advance of the PSC Review meeting. The terminal review will consider the implementation of the Project as a whole, paying particular attention to whether the Project had achieved

its stated goals and objectives and contributed to the broader objectives of the Forestry Department and wider national development objectives. It will act as a vehicle through which lessons learned and any actions that are still necessary can be captured for further replication at the community, national and regional level, particularly in relation to sustainability of the outcomes from Project interventions.

The National Project Coordinator in conjunction with the executing partners will be responsible for the preparation and submission of the following reports that will form part of the monitoring process. An Inception Report (IR), which will be prepared immediately following the launching of the Project. It will include a detailed First Year/AWP divided in quarterly timeframes detailing the activities and progress indicators that will guide implementation during the first year of the project. An Annual Project report (APR) will be prepared on an annual basis prior to the PSC Review, to reflect progress achieved in meeting the AWP.

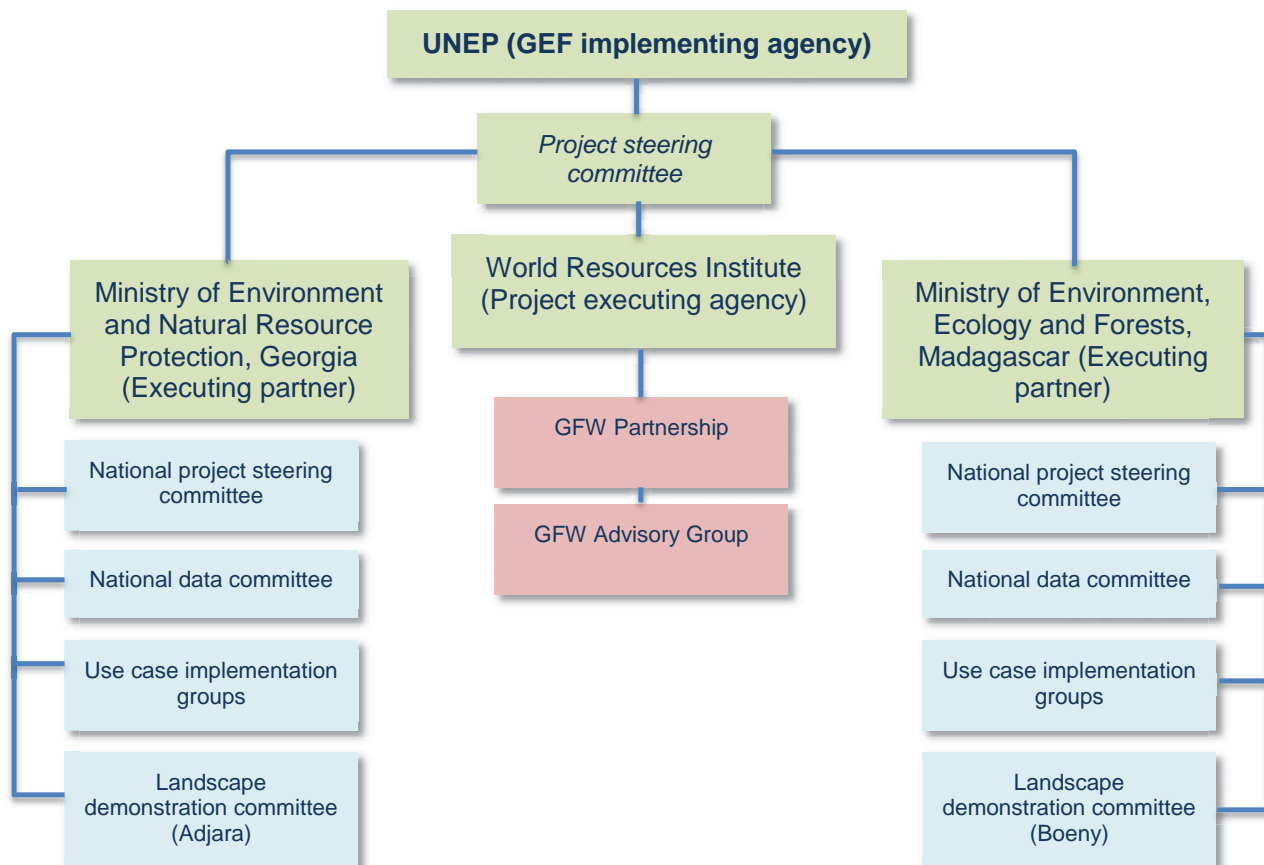
A Periodic Implementation Review (PIR) Report emanating from the process of Project implementation review is the main vehicle for extracting lessons learned. The PIR can be prepared any time during the year and ideally prior to the PSC review. Quarterly Progress Reports outlining main updates in project progress will be provided to the PSC by the National Project Coordinator. Progress made shall be monitored based on the Enhanced Results Based Management Platform and the risk log will be regularly updated based on the initial risk analysis included in the Inception Report.

The Results Framework is provided at Appendix 4. The mid-term targets for these indicators will be established and confirmed during the Inception Workshop.

Appendix 8: Summary of reporting requirements and responsibilities

Reporting Requirements	Due Date	Format appended to legal instrument as	Responsibility of
Procurement plan (goods and services)	2 weeks before project inception meeting		Project Manager Project Coordinator
Inception Report	1 month after project inception meeting		Project Manager Project Coordinator
Expenditure report accompanied by explanatory notes	Quarterly on or before 30 April, 31 July, 31 October, 31 January		Project Manager Project Coordinator
Cash advance request and details of anticipated disbursements	Quarterly or when required		Project Manager Project Coordinator
Progress report	Half-yearly on or before 31 January		Project Manager Project Coordinator
Audited report for expenditures for year ending 31 December	Yearly on or before 30 June		Project Executing Agency (WRI)
Inventory of non-expendable equipment	Yearly on or before 31 January		Project Manager and Project Coordinator
Co-financing report	Yearly on or before 31 July		Project Manager and Project Coordinator
Project Implementation Review (PIR) report	Yearly on or before 31 August		Project Manager and Project Coordinator, UNEP-GEF Task Manager (TM)
Minutes of Steering Committee meetings	Yearly (or as relevant)		Project Manager Project Coordinator
Final Report	3 months after project completion date		Project Coordinator
Final inventory of non-expendable equipment			Project Coordinator
Equipment transfer letter			Project Manager and Project Coordinator
Final expenditure statement	4 months after project completion date		Project Manager Project Coordinator
MTR/MTE	Midway through project		UNEP Task Manager UNEP Evaluation Office
Final audited report for expenditures of project	6 months after project completion date		Project Executing Agency (WRI)
Independent Terminal Evaluation Report	6 months after project completion date		UNEP Evaluation Office

Appendix 9: Decision-making flowchart and organogram



Appendix 10: Terms of Reference

1. PROJECT MANAGER (PM)

The Executing Agency in collaboration with the Implementing Agency will appoint a suitably qualified person to provide primary support for the implementation of the UNEP/GEF supported project “Global Forest Watch (GFW).” The appointee will be based at the Headquarters of the executing agency, World Resources Institute, in Washington, D.C.

Functions

The Project Manager will:

- Provide technical support and administrative leadership to national project teams in Georgia and Madagascar;
- In consultation with national partners, prepare national work plan and annual updates, including national budget allocations;
- Facilitate development and signing of the Letters of Agreement (LoA) with appropriate national partners to undertake activities specified in the work plan;
- Work in collaboration with different project partners from relevant national institutions for the implementation of national project components;
- Ensure efficient and effective communication between and amongst activities at national and global levels;
- Maintain close communication with national project teams, particularly national co-ordinators;
- Participate in the Management Committee Meetings where the work plan and budget of national project components will be agreed by project partners;
- Serve as Executive Secretary and provide support to Project Management Committee in coordinating policy related project implementation at national level;
- Prepare project status reports for the Project Management Committee and ensure that project is executed in accordance with relevant UNEP/GEF and in-country requirements;
- Monitor the financial and budgetary status of the global and national components of the project;
- Be responsible for approving and endorsing all financial documentation of the national components of the project;
- Ensure the delivery of in-kind and in-cash contributions for implementation of project components;
- Assist consultants in their work on project the implementation of project activities;
- Approve terms of reference and conduct hiring procedures for national consultants;
- Oversee public relations for the project;
- Maintain good communication with the other relevant projects as well as with project stakeholders;
- Work to ensure political and policy level buy-in.

Outputs

- Project Management Arrangements are in place and fully functional;
- At least four PMC meetings held each year;
- Scheduled project activities completed successfully;
- Project component implementation well-coordinated;
- Project implementation maximizes synergies with other relevant projects in the country;

- Annual Operational Work plan and budget prepared by and PMU and submitted to PMC for approval on a timely basis;
- Quarterly and annual technical and financial reports prepared and submitted to PMC within stipulated deadlines;
- Transfers of GEF funds from WRI to sub-contractors efficiently accomplished;
- Project objectives successfully met;
- UNEP/GEF norms for monitoring and evaluation of project performance, output delivery and impact applied;
- Nationally contracted consultants and national project staff supervised;
- Effective public relations;

Relationships

The Project Manager will:

- Be accountable to the Executing Agency (WRI) for the achievement of project objectives, results, and all fundamental aspects of project execution;
- Maintain regular communication with the Project Management Committee (PMC);
- Maintain regular communication with the UNEP GEF Task Manager;
- Supervise the work of the Project Coordinator;

Qualifications

- Advanced university degree (Ph.D. or Master's) in ecology, environmental sciences, climate change studies and evidence of training in the field of Natural Resource Management (NRM);
- Minimum of five years' experience in administration/management of national/international projects;
- Proven experience in project management and administrative management;
- Proven experience in facilitating meetings or discussions;
- Experience with GEF policies and procedures including logframe and similar project planning tools;
- Willingness and ability to travel frequently within country and to partner countries;
- Ability to work with senior government officials, research institutes, non-governmental organizations (NGOs), and local communities, etc.;
- Proven ability to manage budgets;
- Fluency in written and spoken English and strong communication skills.

2. TERMS OF REFERENCE OF NATIONAL EXPERTS / TEAM LEADERS

The National Executing Agency in collaboration with UNEP will appoint a suitably qualified candidate to fill the post of National Project Coordinator of the Project.

Functions

The Project Coordinator (PC) will:

- Provide technical and administrative leadership to the project team and act as the national representative of the project at regional and international levels;
- Observe agreed project management procedures in order to facilitate project implementation and ensure delivery of high quality outcomes;
- In consultation with local partners, prepare national work plans and annual updates including national budget allocations;
- Facilitate communications and linkages at local and national levels as well as with the Project Manager;

- Participate in PMC meetings and provide support as required;
- Organize national meetings, draft the agenda, and record decisions of national meetings;
- Coordinate work among Project Management Unit (PMU) staff and the national teams;
- Supervise the management of the project budget in accordance with the agreed work plan and approved disbursement of project funds, taking into account the decisions of project committees;
- Assist the Project Manager in developing monitoring and evaluation reports;
- Participate in the public relations activities for the project in the country;
- Maintain good communication with project partners and others in the country;
- Coordinate country provision of committed in-kind and in-cash contributions for the project.
- Coordinate the national scientific and technical team;
- Coordinate and contribute to the preparation and publication of national scientific and technical outputs from the Project;

Outputs

5. Project management units fully functional;
6. 12 Project Management Unit meetings held each year;
7. At least 4 Technical Advisory Committee meetings held each year;
8. Scheduled project activities completed successfully;
9. Project activities well-coordinated with other relevant projects at national level;
10. Project implementation well-coordinated with PMU;
11. Annual operational plan including budget prepared and submitted on time to the Executing Agency;
12. Quarterly and bi-annual technical (Progress Reports, Project Implementation Reports) and financial reports (GEF fund and Co-financing) prepared and submitted to the Executing Agency completely and timely;
13. National, local and site level workshops and other monitoring meetings as needed convened;
14. Assist UNEP GEF Senior Project Management Officer and the independent evaluator (to be appointed by UNEP in the Mid-Term Review and Final Evaluation of the project);
15. Project objectives successfully met;
16. Effective public relations and public awareness at country level;

Relationships

The Project Coordinator (PC) will:

- Be accountable at national level for the achievement of project objectives, results, and all fundamental aspects of project execution;
- Report to the Project Management Unit (PMU) and Project Management Committee (PMC)
- Be accountable to the Project Manager for the achievement of project objectives, results and all technical aspects of national component execution;
- Maintain regular communication with the local and national project partners that may be interested in furthering the project outcomes;
- Maintain regular communication with project site offices and the PM;
- Supervise the work of the national Technical project support staff;
- Supervise the work of the national consultants and project partners.

Qualifications

Advanced university degree in an Environmental field and evidence of training in Natural Resource Management. The candidate must demonstrate a familiarity with the circumstances related to NRM in SIDS;

- A good understanding of environmental and natural resource issues in Antigua and Barbuda the social circumstance that surround the same.
- A working knowledge of the Antigua and Barbuda National Environmental Management Strategy
- A good knowledge of the United Nations Convention on Biological Diversity and the United Nations Convention to Combat Desertification
- Minimum of 5 years' experience in administration/management of international projects;
- Experience in project management and administrative management;
- Experience in facilitating meetings or discussions;
- Experience with working with regional and international partners
- Willingness and ability to travel frequently within and outside the country
- Ability to work with senior government officials, research institutes, non-governmental organizations (NGOs), and local communities.
- Fluency in written and spoken English and strong communication skills.

3. TERMS OF REFERENCE FOR ADMINISTRATIVE ASSISTANT (PA)

The Executing Agency in consultation with the PC will appoint a suitably qualified person to provide support to the execution of the national aspects of the UNEP implemented, GEF supported project.

This will include:

Functions

The Project Assistant will undertake the following duties:

- Provide support to the PM and PC in the financial and administrative management of the project;
- Act as secretary to the PMU
- Assist in project administration by assembling and preparing necessary documentation; helping to prepare letters of agreement for research and consultancy services; monitor budgets and liaise with accounting staff about payments and financial reports; interact with external agencies on non-technical and administrative matters;
- Assist in recording and monitoring project expenditures and funds availability in close consultation with the PM;
- Assist PM and PC in preparing quarterly financial reports and reimbursement claims for submission to the Executing Agency;
- Undertake office fixed assets inventory and its reporting to the Executing Agency;
- Format reports, proceedings and other relevant documents;
- Assist PM and PC in organizing and conducting PSC Meetings and National Workshops;
- Assist Project Coordinator in communication with national partners and local authorities by phone, fax and other correspondence;
- Update project website;
- Assist PM assembling necessary information to prepare reports;

Outputs

- Project activities are implemented successfully;
- Annual operational plan including budget prepared and submitted in timely manner;

- Quarterly and annual technical and financial reports prepared and submitted in timely manner;
- UNEP/GEF norms for monitoring and evaluation of project performance, output delivery and impact applied;
- PMU functions effectively;
- Project website is developed and maintained.

Relationships

The National Administrative Assistant will:

- Report directly to the PM and PC;
- Maintain regular communication with the PMU, PM and PC;
- Be accountable to the PM and PC for the functioning of the PMU;
- Provide administrative assistance to the PMU.
- Will act as the focal point in information gathering/dissemination from/to national partners.

Qualifications

- Minimum of two years of professional experience relevant in international or government organizations;
- Proven ability to manage budgets;
- Experience in word processing and other relevant office applications software packages;
- Fluency in written and spoken English.

4. TERMS OF REFERENCE OF NATIONAL PROJECT STEERING COMMITTEE (PSC)

Project Steering Committees (PSCs) will be established in Georgia and Madagascar to provide general oversight and guidance to the project's national components, facilitate inter-agency coordination and monitor national-level activities. Each PSC will be comprised of individuals representing key sectors and institutions and will ensure the project fits within local, national, and international needs. They will include representatives of the NGO community and civil society.

The PSC will hold its meetings at least one time per year and its primary activities are to:

Provide general oversight and guidance to the project;

- Facilitate interagency coordination;
- Review and approve the annual work plans and annual technical reports;
- Review budget and co-financing status;
- Supervise the evaluation, monitoring and reporting aspects of the national component;
- Review and advise on implementation of national project component, as defined in the project logframe and work plan, through the evaluation of bi-annual reports, records of meetings and other relevant documents;
- Monitor inputs of international and national partners, ensuring that project obligations are fulfilled in a timely and coordinated fashion;
- Review and approve national components outputs.

Appendix 11: Co-financing commitment letters from project partners



WORLD
RESOURCES
INSTITUTE

GLOBAL
FOREST
WATCH

10 G Street, NE Suite 800 Washington, DC 20002 USA (PH) +1 (202) 729-7600 (FAX) +1 (202) 729-7610 www.WRI.org

7 December, 2014

Brennan Van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF Coordination and Contributions
United Nations Environment Programme

Brennan.vandyke@unep.org

Dear Ms. Van Dyke:

Co-financing for "Global Forest Watch"

On behalf of the **World Resources Institute**, I am pleased to confirm support for the UNEP-GEF project "Global Forest Watch", which is aimed at reducing deforestation and improving rural livelihoods by transforming forest management and conservation at a global scale.

We anticipate that our co-financing support will amount to USD 6 million in cash, based on grants from various sources, including the Governments of Norway, the United States and the United Kingdom. These funds will contribute to each of the project's three components. Funding for technical staff and other inputs will support the application and enhancement of GFW globally and in pilot countries (Component 1). Uptake and replication of GFW based on lessons learned in pilot and other countries will likewise be supported (Component 2). Finally, funds will support technical staff and sub-grants to GFW partner organizations, thus contributing to strengthening of the overall partnership (Component 3) and to the uptake and enhancement of the GFW platform globally.

Sincerely yours,

Steve Barker
CFO, World Resources Institute

Copy to:
GEF Operational Focal Point
Ersin Esen, UNEP/GEF Task Manager, Ersin.Esen@unep.org



საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის
სამინისტრო
MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES PROTECTION OF
GEORGIA



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6 G. Gulua Str. 0114, Tbilisi, Georgia, Tel: (+995 32) 2727200, 2727220, Fax: 2727237; www.moe.gov.ge

7380

19 / December / 2014

To: Brennan Van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF Coordination and Contributions
United Nations Environment Programme
Brennan.vandyke@unep.org

Copy to: Ersin Esen
UNEP/GEF Task Manager
Ersin.Esen@unep.org

Nino Tkhilava
GEF Operational Focal Point
Head of the Environmental Policy and International Relations Department
Ministry of Environment and Natural Resources Protection of Georgia

Dear Ms. Van Dyke:

Co-financing for "Global Forest Watch"

On behalf of the Ministry of Environment and Natural Resources Protection of Georgia, I am pleased to confirm support for the GEF/UNEP Project "Global Forest Watch" which aims to develop and apply innovative GFW technology that will contribute to reducing deforestation, forest and land degradation, reduce illegal activities and support biodiversity conservation in the pilot countries (including Georgia) as well as on a global scale.

We anticipate that our support to the project over the next 3 years (April 2015 – April 2018) will amount to USD 2,000,000 in kind.

19/12/2014

საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის სამინისტრო

Sincerely yours,

Deputy Minister



Giorgi Somkhishvili



Secretary General

Antananarivo, 02 FEB 2015

to

Brennan Van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF Coordination
and Contributions
United Nations Environment Programme

N° 076 /15/MEEMF/SG

Co-financing for Global Forest Watch Project

Dear Van Dyke

On behalf of the Ministry of Environment, Ecology and Forest, I am pleased to confirm the support to the GEF/UNEP Project "Global Forest Watch 2.0" which aims to develop and apply innovative GFW technology for reducing deforestation and biodiversity loss in Madagascar during 3 years. Regarding to co-financing to implement the project activities, the Ministry in charge of Environment and its Partners commit to provide our in kind contribution (US \$ 2,500,000.00) which is detailed below:

-the Ministry of Environment, Ecology and Forest through General Direction of Environment provides, as in-kind support, US \$ 197,000.00 (see below the detail):

Activity	In-kind Contribution Amount (USD)
DGE staff salaries in-kind for project preparation and implementation	63,000.00
In kind DGE facilities for project implementation	133,000.00
Meetings	1,000.00
Amount	197,000.00

-as the Ministry of Environment, Ecology and Forest cannot cover all amount of required co-financing (US \$ 2,500,000.00), certain Partners of Ministry like Madagascar National Parks and Manondroala Project (Finnish Association for Nature Conservation) bring respectively US \$ 2,203,000.00 and 100,000.00 as in kind contribution during of implementation of this project .

Sincerely yours.

Copy to:
Ersin Esen, UNEP/GEF Task Manager



RABEANTOANDRO Marcellin

Letter of Support

January 20, 2015

United Nations Environment Programme (UNEP) / Global Environment Facility (GEF)
United Nations Avenue, Gigiri
PO Box 30552, 00100
Nairobi, Kenya
E-mail: gefinfo@unep.org

Dear Mr./Ms.,

It is my pleasure to write a letter in support of the proposal of Global Forest Watch (GFW) being submitted to the UNEP/GEF Trust Fund by the Ministry of Environment, Ecology and Forest of Madagascar (MEEF).

Project Manondroala, implemented in Madagascar by the Finnish Association for Nature Conservation (FANC) since 2011, is a development cooperation project funded by the Ministry for Foreign Affairs of Finland. The full name of the project is "Manondroala - Collaboration on protection, restoration and monitoring of forests in Madagascar", and it has been focusing on mapping the degradation of eastern humid forest corridor of Madagascar. FANC is the biggest and most influential environmental non-governmental organization (NGO) in Finland with more than 30 000 members nationally.

The main NGO partners of FANC in project Manondroala are Transparent World from Russia and Association Mitsinjo, Madagascar Institute for the Conservation of Tropical Environments (MICET), Centre ValBio and Durrell Wildlife Conservation Trust in Madagascar. The project collaborates with the Universities of Antananarivo and Helsinki, and the Ministry of Environment, Ecology and Forest of Madagascar (MEEF), and is an active member of Comité National de Télédétection (CNT) in Madagascar.

The proposed GFW project is a great opportunity to create a coherent and widely applicable national forest mapping and monitoring tool, and gives our project a chance to find synergy with the global forest monitoring network. Our role in the project is to connect GFW to local actors, provide detailed forest data and technical support, and participate in the development of the methodology.

In conclusion, I fully support the proposal of GFW/MEEF, since I believe the project can greatly benefit the Malagasy state and environmental administration, as well as the whole conservation community from local to international level. Our in-kind co-financing for the GFW project will be \$ 100,000 (USD).

Sincerely,

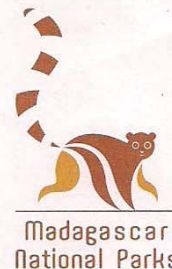


Titta Lassila
Coordinator of Project Manondroala
Finnish Association for Nature Conservation

Suomen  luonnonsuojeluliitto

Suomen  luonnonsuojeluliitto

Antananarivo, le 09 AVR 2015



à

Madame le Directeur Général de l'Environnement
Ministère de l'Environnement,
de l'Ecologie, de la Mer et des Forêts
Ampandrianomby
Antananarivo

N° 250 /15/DG/DGA

Objet : Révision d'Engagement de co-financement pour le Projet Global Forest Watch 2.0

N/Référence : Lettre N°80/15/DG/DGA du 23 janvier 2015

VI/Référence : Lettre N° 101- 15/MEEMF/S&DGE/BNCCC en date du 30 mars 2015

Madame le Directeur Général,

Madagascar National Parks se félicite que Madagascar ait été choisi comme l'un des pays pilotes bénéficiaires de l'appui du Fonds pour l'Environnement Mondial dans le cadre du projet Global Forest Watch 2.0 dans lequel nous sommes impliqués. En effet, Madagascar National Parks contribue de par ses activités au sein d'un réseau de 2,8 millions d'Ha environ, à la réduction de la déforestation, de la dégradation des forêts et des terres, à la réduction des activités illégales, à la conservation de la biodiversité, ce qui est en totale cohérence avec le projet.

Nos activités dans ce sens (patrouilles et surveillance, restauration d'habitat, suivi écologique, surveillance des feux par voie satellitaire et lutte contre les feux, appui au développement local, éducation environnementale, etc....) sont liées à un PTA et un budget validés chaque année par notre Conseil d'Administration.

Nous nous engageons à assurer et à prendre en charge toutes ces actions qui contribuent à l'atteinte des objectifs du projet, et qui peuvent ainsi être comptabilisées comme co-financement de notre part. Cette contribution à travers nos activités peut être évaluée à un montant de l'ordre de 2,2 millions USD environ.

Veuillez agréer, Madame le Directeur Général, l'expression de nos salutations distinguées.

Pour le Directeur Général, p.o



Herijaona Randriamanantsoa
Directeur Général Adjoint

For life

giz 6, Gulua Street • 0114 Tbilisi • Georgia

Brennan Van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF
Coordination and Contributions
United Nations Environment Programme
Brennan.vandyke@unep.org

German Development Cooperation
Sustainable Management of Biodiversity, South
Caucasus

6, Gulua Street
0114 Tbilisi, Georgia
T +995 32 220 18 28
F +995 32 220 18 01

Your reference:
Our reference: 11.2197.9-004.10 G8022/F20.5

December 19, 2014

Co-financing for "Global Forest Watch"

Dear Ms. Van Dyke,

On behalf of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, I am pleased to confirm support for the UNEP-GEF "Global Forest Watch" project, in particular with respect to Component 1 pilot country activities in the Republic of Georgia.

GIZ supports the Georgian Ministry of Environment and Natural Resource Protection (MoENRP) with its regional programme "Sustainable Management of Biodiversity, South Caucasus" in the field of national forest monitoring, among others. In Georgia, the project focuses, *inter alia*, on identification of forest cover based on RapidEye imagery, as well as support to planning the development of a comprehensive forest monitoring system.

We anticipate that the German and Austrian funding for the above-mentioned area of work, whose aims are potentially highly complementary to those of the GEF GFW project, will amount to at least USD 500,000 over the 2015-18 period. The work will be implemented in parallel with GEF GFW and no funds will be transferred from GIZ to the GEF project. Coordination of GIZ and GEF GFW support will be ensured through the MoENRP but I want to underline my wish that we also seek for close bilateral contact on that matter. We look forward to close co-operation with the GEF project team.

Kind regards,

Hans-Joachim Lipp
Programme Director



Cc MoENRP Georgia, attn. Mrs. Nino Tkhalava (International Cooperation and Policy Department)
Cc MoENRP Georgia, attn. Mr. Karlo Amigulashvili (Forest Policy Service)
Cc Coordination Office of Austrian Development Agency in Tbilisi, attn. Mr. Gunther Zimmer
Cc Chris Cosslett; chris.cosslett@gmail.com
Cc Team Leader Georgia for "Sustainable Management of Biodiversity, South Caucasus"

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

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Registration no. HRB 18384
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Frankfurt am Main, Germany
Registration no. HRB 12394

Chairman of the Supervisory Board
Dr Friedrich Kitschelt, State Secretary

Management Board
Tanja Genner (Chair)
Dr Christoph Beier (Vice-Chair)
Dr Hans-Joachim Preuß
Cornelia Richter



UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement Programa de las Naciones Unidas para el Medio Ambiente

Программа Организации Объединенных Наций по окружающей среде

برنامج الأمم المتحدة للبيئة

联合国环境规划署



To:	Mrs Brennan Van Dyke Director, GEF Coordination Office, UNEP	Date:	22 December 2014
From:	Edoardo Zandri, Chief, Terrestrial Ecosystems Unit, CCATE Branch, DEPI, UNEP	Reference:	DEPI/TEU/EZ
Subject:	<i>Letter of co-funding commitment for the GEF full-size project: "Global Forest Watch"</i>		

Dear Brennan,

This note confirms the commitment of the UNEP DEPI Terrestrial Ecosystems Unit (TEU) to provide in-kind support to the full-size GEF/UNEP project: ***"Global Forest Watch"***. The in-kind co-financing to be provided by the TEU is estimated at \$300,000 over a four years period (2015-2018), contributing to all project components and particularly to Component 2 (System uptake and replication), and Component 3 (Strengthening and sustaining the GFW partnership).

Our co-financing is linked to the ongoing UNEP project "ecosystem management of productive landscapes" which includes a list of 42 GEF/UNEP projects which may offer the opportunity to further test and scale-up GFW results, and i.e. subsequently also expand the scope of GFW to become a valuable tool for broader 'landscape monitoring', beyond Forest ecosystems. UNEP's in-kind co-financing will entail, but not necessarily be limited to, i.e.: TEU staff time to review project technical outputs and foster linkages and cross-fertilization with other UNEP initiatives on reducing deforestation and improving rural livelihoods by transforming forest management; sharing of relevant guidelines, publications, tools and methodologies on monitoring forest coverage, the role of forests in the transition to a Green Economy, the nexus between integrated ecosystem management and food security, biodiversity conservation and sustainable financing of forest management, that will be produced by UNEP and the TEU during the project period; providing linkages with the activities of UNEP in the framework of UN-REDD; Guidelines on multiple benefits of forests and the green economy, natural capital valuation and REDD+, REDD+ safeguards information systems, involvement of IPs and forest-dependent peoples in forest management and REDD+.

The TEU will also liaise with other relevant divisions in UNEP and within our partners on forest management including i.e. FAO, IFAD, LPFN and IUCN to ensure that project lessons learned are widely shared through the international networks,

Yours sincerely

Edoardo Zandri
Chief, Terrestrial Ecosystems Unit
UNEP/DEPI

Copy to:

Mohamed Sessay, UNEP-DEPI, mohamed.sessay@unep.org

Ersin Esen, UNEP-DEPI, ersin.esen@unep.org

Tim Christophersen, Team Leader, UNEP REDD, DEPI/TEU, Tim.Christophersen@unep.org

Keith Alverson, Head, DEPI/CCATEUB, Keith.alverson@unep.org

Neville Ash, Deputy Directory, UNEP DEPI, Neville.ash@unep.org

Niklas Hagelberg, EM SP Coordinator, UNEP-DEPI, niklas.hagelberg@unep.org



December 12, 2014

Brennan Van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF Coordination and Contributions
United Nations Environment Programme

RE: Co-financing for "UNEP-GEF Project 5636: Global Forest Watch"

Dear Ms. Van Dyke:

On behalf of Esri, I am pleased to confirm support for the GEF Project "UNEP-GEF Project 5636: Global Forest Watch" which is aimed at supporting global implementation of Global Forest Watch and national implementation in Georgia and Madagascar.

We anticipate that our support to the project over the next 3 years (project duration) will amount to **well over USD \$9,494,000 in kind**. This would be comprised of ArcGIS software, online services, content and support.

Esri develops Geographic Information System ("GIS") software to demonstrate geography as a primary means to solve complex problems through collection, analysis, and communication of information. We believe better information makes for better decisions. Through offering GIS software and service to the World Resources Institute and Global Forest Watch Partnership, Esri will contribute to a global online platform that will allow people to better manage forests all over the world.

On behalf of Esri, we look forward to working with and contributing to the ICMA Alliance's efforts in bringing innovative solutions to the USAID's Middle East Water Security Initiative.

Regards,

Sincerely yours,

A handwritten signature in black ink, appearing to read "Salim Sawaya", written in a cursive style.

Salim Sawaya
Manager, Esri Nonprofit & Global Organizations

*Cc: GEF Operational Focal Point
Ersin Esen, UNEP/GEF Task Manager, Ersin.Esen@unep.org*



Transparent World

www.transparentworld.ru

Rumyantsevo Business Park, bld.1, entrance 8, 5th floor, room 531a

Kiev Highway 1, 142784, Moscow, Russia

Tel./Fax: +7 (495) 739-738-5, E-mail: info@transparentworld.ru

Brennan van Dyke
Deputy Director, Office for Operations
Director, Donor Partnerships, GEF Coordination and Contributions
United Nations Environment Programme

Dr. Andrew Steer
President and CEO
World Resources Institute
10 G Street, NE
Washington DC 20002, USA

December 18, 2014

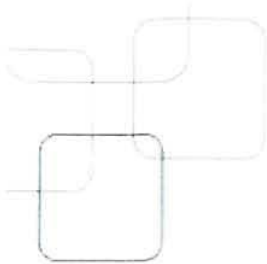
Dear Mr. van Dyke, dear Dr. Steer,

On behalf of Transparent World, I am pleased to offer our endorsement of the new Global Forest Watch (GFW) initiative and would like to aid by donating a substantial amount of high-resolution satellite imagery for use by its partners.

We make the high-resolution imagery available for use by WRI and other GFW partners, such as Imazon, University of Maryland, World Bank (Global Tiger Initiative, Snow Leopard Initiative, and Open Landscape Partnership Platform), Jane Goodall Institute, Consumer Goods Forum, and others to: (a) calibrate and validate the interpretation of lower-resolution imagery (e.g., from NASA's LandSat and MODIS platforms); (b) develop Open Landscape Platform, Open Street Map, and other crowd-mapping partnerships, local capacity for collaborative mapping and monitoring of conservation hotspots and critical habitats in the interested jurisdictions; and (c) advance other non-commercial applications of this imagery in the interest of promoting open spatial data use. We expect that this will greatly enhance the effectiveness of Global Forest Watch and related partnerships.

This contribution became available due to the generous donation by our close partners from the ScanEx Research & Development Center who paid the satellite data supplied by DigitalGlobe, Inc. and negotiated the conditions of the License Agreement for Transparent World.

Most of the images were selected by Transparent World on the bases of the following global priorities: protected areas within the tiger and snow leopard distribution in Asia, tropical plantations in various parts of the world to capture the diversity of plantations, and areas across the tropics where the GFW map shows significant changes in forest cover. A substantial amount of images have been selected for Madagascar, including areas where illegal logging of rose wood is known to occur.



The images may be used for visual analysis and for drawing contours through the web interface. Transparent World also could do processing and analysis of the raw data on request by WRI and other GFW partners. Raw data may also be transmitted to WRI or partners on request.

While targeted strictly at non-commercial applications, the value of the images most directly relevant to achievement of the project objectives is estimated at \$7.1 million—including US\$ 2.1 million for Madagascar images and at least US\$ 5 million for other GFW global priority areas targeted by the GEF-GFW project.

We are confident that this donation will contribute substantially to achieving the objectives of the Madagascar and global components of UNEP-GEF Project 5356, Global Forest Watch. We look forward, in this context, to an ever closer partnership and collaboration with current and additional GFW partners, including the GEF.

Yours sincerely,

Dmitry Aksenov
Director General



Appendix 12: Endorsement letters of GEF National Focal Points

(Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Nino Tkhilava	Head, Department of Environmental Policy and International Relations	MINISTRY OF ENVIRONMENT PROTECTION OF GEORGIA	MARCH/14/ 2013
Ralalaharisoa Christine Edmée	General Director of Environment	MINISTRY OF ENVIRONMENT AND FORESTS	MARCH/18/ 2013



საქართველოს გარემოს დაცვის სამინისტრო
MINISTRY OF ENVIRONMENT PROTECTION OF GEORGIA



KA060164101154913

საქართველო, 0114 თბილისი, გ. გუგუშვილი ქ. №6, ტელ: 2727200, 2727220, ფაქსი: 2727237, www.moe.gov.ge
6 G. Gukashvili Str. 0114, Tbilisi, Georgia, Tel: +995 32) 2727200, 2727220, Fax: 2727237, www.moe.gov.ge

870

14 / March / 2013

To: Ms. Maryam Namir-Fuller
Director
GEF Coordination Office
United Nations Environment Programme
Block 2, North Wing, PO Box 30552 Nairobi, Kenya

Subject: Endorsement for Global Forest Watch 2.0

Dear Ms. Namir-Fuller,

In my capacity as GEF Operational Focal Point for Georgia, I confirm that the above project proposal (a) is in accordance with the national priorities of the Government of Georgia including, the priorities identified in the National Environmental Action Plan (NEAP 2012-2016) of Georgia and our commitment to the relevant global environmental conventions; and (b) was discussed with the stakeholders, including the National Focal Points of the relevant global environmental conventions.

I am pleased to endorse the preparation of the above project proposal with the support of UNEP. If approved, the proposal will be prepared and implemented by the Forestry Unit of the Ministry of Environment Protection of Georgia. I request UNEP to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing from GEF Trust Fund being requested for this project is US\$2,000,000, inclusive of project preparation grant (PPG), if any, and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for Georgia is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			Project Preparation	Project	Fee	Total
GEF TF	UNEP	CC	22,831	890,411	86,758	1,000,000
GEF TF	UNEP	LD	22,831	890,411	86,758	1,000,000
Total GEF Resources			45,662	1,780,822	173,516	2,000,000

I consent to the utilization of Georgia's allocations in GEF-5 as defined in the System for Transparent Allocation of Resources (STAR).

Sincerely,

GEF Operational Focal Point in Georgia
Head of Department of Environmental Policy and
International Relations

ბ. თხილავა

Nino Tkilava

Copy to: Mr. Grigol Lazriev, Convention Focal Point for

UNFCCC

Mr. Ioseb Kartsivadze, Convention Focal Point for
UNCBD

Ms. Nino Chikviani, Convention Focal Point for
UNCCD



SECRETARIAT GENERAL

DIRECTION GENERALE
DE L'ENVIRONNEMENT

Antananarivo, le 18 MAR 2013

The General Director of Environment
GEF Operational Focal Point pour Madagascar

To

Maryam Niamir-Fuller
Director, GEF Coordination Office
United Nations Environment Programme
Block 2, North Wing, P.O Box 30552 Nairobi, Kenya

N° 76 /13/MEF/SG/DGE.

Subject: Endorsement for the project „Global
Forest Watch 2.0 (GFW 2.0)“

Dear,

In my capacity as GEF Operational Focal Point for Madagascar, I confirm that the above proposal (a) is in accordance with the government's national priorities and NBSAP and our commitment to the relevant global environmental conventions and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of the GEF Agency(ies) listed below. If approved, the proposal will be prepared and implemented by General Directorate of Environment (DGE) / Directorate of Climate Change in the Ministry in charge of Environment and GFW 2.0 partners. I request the Agency(ies) to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing (from GEFTF, LDCF, SCCF and/or NPIF) being requested for this project is US\$ 2.500.000, inclusive of project preparation grant (PPG), if any, and Agency fees for the project cycle management services associated with the total GEF grant. The financing requested for Madagascar is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US\$)			
			Project preparation	Project	Fee	Total
(select)	UNEP	BD	45,662	1,780,822	173,516	2,000,000
(select)	UNEP	CC	11, 416	445,205	43,379	500,000
(select)	(select)	(select)				0
Total GEF Resources			57,078	2,226,027	216,895	2,500,000

I consent to the utilization of Madagascar's allocations in GEF-5 as defined in the System for Transparent Allocation of Resources (STAR).

Sincerely,

DIRECTEUR GENERAL
DE L'ENVIRONNEMENT

Christine Edmée

Copy to : Convention Focal Point for UNFCCC
Convention Focal Point for UNCBD

Appendix 13: Draft procurement plan

To be generated during inception phase and approved by UNEP within budget presented in Appendix 1.

Appendix 14: Tracking Tools

See separate Excel files

Appendix 15: GFW and REDD+

Relevance of GFW to REDD+ at the international level (policies, plans or needs):

GFW and associated analysis will provide international policymakers, analysts and other stakeholders with timely information on national levels of forest loss and regrowth on a consistent global basis, and analysis on drivers and underlying causes of forest loss. Initially, at least 58 tropical countries are covered by the near-real-time forest clearing alerts function, giving valuable indications, updated every 16 days and consolidated monthly, of where forest clearing is occurring near-real-time and of how regional patterns of forest cover change are shifting. For example, recent data from the prototype GFW system indicates declining rates of forest clearing events in Brazil, but rising rates in the majority of their neighboring countries and other tropical regions such as West Africa, perhaps indicative of regional leakage.

Through the partnership with the University of Maryland, forest cover loss and regrowth information annually will be available through GFW for all countries (for more details on the precise resolution and capabilities of various systems on the GFW platform, please see the *Technical Appendix* at the end of this proposal).

Relevance to development objectives of the country and the national REDD+ agenda (its own policies, plans or needs):

The initiative is designed from the start to support national development objectives, across dozens of countries. Key tasks that GFW will help support include:

Improving the design, implementation, and enforcement of policies and laws

Deeper understanding of *drivers* and *patterns* of deforestation, based on information and analysis from the GFW 2.0 platform and partners, will enable governments to design better policies and other interventions aimed at promoting sustainable management of forest lands and resources.

- Once new policies and measures are introduced, the GFW platform can provide rapid feedback to policy-makers on the policy impacts. Unintended impacts and ineffective measures can be detected quickly and adjustments can be made. Lessons learned about policy effectiveness will enhance future policy decisions
- Greatly enhanced detection and enforcement, for example around deforestation restrictions (such as Indonesia's moratorium), protected areas management, and plantation establishment. Government agencies and independent groups will be able to react quickly when high likelihood of infractions is detected with monthly updates online for all to see.

Enabling robust MRV of REDD+

- Support the creation of transparent reference levels and monitoring of sub-national REDD+ programs (jurisdictional and project level) that reward local actors for reducing emissions from deforestation and degradation
- Enabling national governments to consistently monitor REDD+ projects, strategies and investments across the forest landscape, detecting leakage and other dynamics that are key to the integrity of national REDD+ programs.

Appendix 16: Georgia national GFW report

I. Situation analysis related to forest information systems

1. Forest monitoring systems and related information flows

a. Policy, legal and institutional aspects

Forest Code of Georgia (1999), a major piece of legislation related to forest, obliges responsible national authorities to organize system for inventory of the state forest fund, and to establish rules for forest monitoring and for running the forest fund cadastre.⁵⁸ *Inventory* of the state forest fund includes a) determining forest conditions, species composition and age structure; quantitative and qualitative assessment of resources; b) revealing endangered and rare, relict, endemic plant species with restricted distribution area included in the Red List of Georgia; c) biological, pathological and other examination of the state forest fund.⁵⁹ *Monitoring* of the state forest fund is a system of assessment of the forest fund, continuous observation, analysis and prognosis of dynamics of its conditions.⁶⁰ Planning of use of the state forest fund is implemented on the basis of forest inventory and forest monitoring.⁶¹ Results of monitoring need to be reflected in forest management and forest use plans.⁶²

Agencies responsible for forest inventory and monitoring are: National Forest Agency, managing state forest fund, except forests in protected areas, forest in Autonomous Republics and forest of local importance; Agency of Protected Areas; authorities of Autonomous Republics and local authorities.⁶³ Though, local authorities due to lack of capacity and mechanisms to manage forest, have not been able to actually implement their competencies in practice.⁶⁴

Law on Managing Forest Fund (2010), regulating management of the forest fund by the National Forest Agency, outlines competencies and responsibilities of the Agency, including related to forest inventory and monitoring.

Specific guidelines for inventory and monitoring of the state forest fund are defined by the Government resolution on **Forest Inventory, Planning and Monitoring Rules**.⁶⁵ The resolution defines a) types of forest inventory, implementation methods and requirements; b) methods for development of forest management and forest use plans and procedures for their review and approval; c) rules and methods for implementing monitoring. According to the resolution, forest inventory implies biological, ecological and economic assessment of forest condition that is the basis for rational use of forest and timber resources. Aim of forest inventory is defining quantitative and qualitative characteristics of forest natural resources and developing forest management plans or forest use plans on this basis. Forest inventory works include preparatory works – gathering information, field works and desk works – processing information obtained as a result of preparatory and field works, using computer software and developing forest management plans and forest use plans on its basis. Technical foundation of forest inventory are orthophoto plans, topographic maps, grove maps, existing forest inventory materials, the digital model of the terrain height, information on forest boundaries provided by the National Agency of Public Registry, adjusted forest boundaries based on field works and on the basis of land ownership information.

Forest inventory involves inventory of natural resources of forest, analysis of quality features of the existing forest and timber resources; elaboration of forest management measures for forest resources use,

⁵⁸ The Forest Code of Georgia 1999, Article 11

⁵⁹ Ibid, Article 23

⁶⁰ Ibid, Article 25

⁶¹ Ibid, Article 24

⁶² Ibid, Article 25

⁶³ Forest Code of Georgia, 22 June 1999, Articles 15,16

⁶⁴ National Forest Concept of Georgia, approved by Parliament Resolution #1742-Is of 11 December 2013, Kutaisi, Georgia

⁶⁵ Forest Inventory, Planning and Monitoring Rules approved by Resolution N179 of Government of Georgia of 17 July 2013

tending, protection, restoration and improvement; defining boundaries of the object and developing recommendations on its division by management units; developing GIS data base, thematic maps, cadastre drawings and other cartographic materials; defining areas covered by forest and areas not covered by forest, including preparing recommendations on categorization of areas not covered by forest; division of groves according to taxation characteristics; revealing degraded, eroded, burned, damaged areas and planning corresponding restoration-regeneration, fire safety, pest and disease control measures; determining volumes of forest and timber resources; gathering information about other non-timber resources; defining territories for recreational, tourist, sports and cultural purposes as well as other forest uses; obtaining other information about forest conditions; revealing intact groves containing endangered, rare, relict, endemic species with restricted distribution area included in the Red List of Georgia etc. The resolution defines two types of inventory – selective and detailed.

Forest monitoring is a system of assessment of forest fund and constant observation, analysis and prognosis of its conditions. The aim of forest monitoring is to reflect forest tending, restoration, forest use, physical protection and ecological condition of forests and to analyse obtained results in order to plan its improvement. Ground for forest monitoring is forest management plans and forest use plans. Forest monitoring is implemented by a responsible forest management agency. In addition, forest user conducts forest monitoring on its territory and submits results to the responsible agency. There are aerial and terrestrial monitoring methods. Aerial monitoring is conducted by means of satellite observation and aerial photographs. Terrestrial monitoring is conducted by means of physical observation-study of actual conditions, or distant observation and data actualization for inaccessible areas. Results of monitoring should be reflected in forest use plans and forest management plans.

Forest management plans are developed by a responsible forest management agency. Draft forest management plan should be published on the website. Stakeholders have 20 business days for submitting their comments to the responsible agency. Within 15 business days after this, responsible agency reviews received comments and organizes public hearing for stakeholders. Final forest management plan, together with the protocol of public hearing is submitted to the Minister for approval (or head of Environmental Agency in Adjara).

Forest use plan is developed on the basis of forest management plan. Terms of reference for forest inventory in the area subject to licensing is developed by the responsible agency who also implements inventory. Based on the inventory, license holder develops forest use plan. Responsible agency ensures publication of draft forest use plan on the official website no later than 5 business days after license seeker submits the draft plan. Stakeholders can submit their comments within 15 business days after publishing the draft plan. After this, responsible agency reviews submitted comments within 15 business days and organizes public hearing for stakeholders. Responsible agency provides received comments to the license seeker. In case all comments are duly considered and incorporated into the forest use plan, responsible agency submits the plan for approval to the Minister within 40 days after submitting the draft plan. Otherwise, the plan with comments is returned to the license seeker, which is required to re-submit the finalized plan within three month. After re-submitting, the plan undergoes all above-mentioned procedures from the start.

Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures defines 25 biodiversity indicators, including those related to forest, corresponding methodologies for their description and related procedures. The aim is to create unified biodiversity monitoring system and to promote data exchange in order to obtain adequate information on biodiversity and trends, create response system and integrate this into national policies.

Source of information for biodiversity monitoring (calculation of indicators) could be information received from state and non-governmental organizations upon written request of the Ministry of Environment and Natural Resources Protection; information produced within the Ministry; information produced on the basis of purchased services by the Ministry; information produced as a result of donor support by request of the Ministry and other. Service of Biodiversity Protection processes information and conducts monitoring according to approved indicators. The Ministry may publish results of biodiversity monitoring on the website or produce printed publications to be distributed to stakeholders. With the aim of implementing biodiversity monitoring, analysing monitoring results and developing

recommendations, at the Ministry could be created Coordinating Council for Unified System of Biodiversity Monitoring. Based on biodiversity monitoring results and when needed also recommendations of the council, the Ministry can develop recommendations on measures to be implemented for biodiversity protection and improved management of this field, and implement these measures accordingly.⁶⁶

b. Stakeholder analysis, including responsibilities and requirements to generate and share data and information

Forest Policy Service a structural unit of Ministry of Environment and Natural Resources of Georgia participates in development of national policy in forest management and supports its implementation; develops forest strategy; reviews proposals on adjustment of forest borders and prepares corresponding recommendations; develops recommendations based on forest monitoring results. Forest Policy Service is eligible to request and obtain needed information and materials relevant for implementing their competences from other state structures.⁶⁷

National Forest Agency a legal entity of public law under Ministry of Environment Protection and Natural Resources of Georgia manages forest fund; implements forest tending and recovery; manages forest use; conducts forest inventory; conducts forest monitoring and processes and analyses obtained data; carries out forest control activities, except for license conditions; ensures sustainable use of biodiversity components; observes forest fire prevention measures; participates in emergency response and other. The Agency has nine territorial units throughout Georgia.

Department of Forest Inventory under the Agency is responsible for preparing documentation for adjustment of forest boundaries; organizing forest monitoring; organizing GIS systems related to forest fund; organizing development of forest management plans and other. *Department of Forest Use* plans forest use; reviews forest use plans and prepares corresponding conclusions; prepares documentation for the object of forest use; prepares projects of forest use agreements; organizes surveillance on implementation of conditions defined under forest use agreements and participates in surveillance. *Department of Forest Tending and Restoration* is responsible for developing recommendations and projects on implementing forest tending and restoration activities and organizes planning, implementation and monitoring of these activities. *Analytical Department* among other responsibilities organizes development of electronic information system for the Agency use; and on the basis of consolidated data, prepares and manages reference books and analytical reports; systematizes data related to forest conditions and other information; organizes statistical reporting; prepares regular, including operative information-analytical materials; develops information and communication infrastructure and ensures its functioning and enhancement. *Regional Forest Services* located in nine regions in Georgia support defining/adjustment of forest boundaries; develop proposals for division of forest fund in management units; implement forest monitoring and process, systematize and analyse obtained information; identify areas for implementing forest tending and restoration and implement forest tending and restoration measures; support GIS system related to forest fund; prepare documentation for the object of forest use; support implementation of forest inventory and planning; run relevant electronic information systems; control implementation of conditions under forest use agreement; participate in review of forest use plans and develop corresponding proposals; participate in forest use planning; participate in developing proposals for reproduction of forest resources, improvement of species composition, restoration and regeneration, fire prevention, protection from pests and diseases; participate in planning and implementation of fire prevention measures; control observation of fire prevention rules on the territory of forest fund and in case of fire, take measures for its elimination and inform immediately relevant agencies; participate in emergency response in case of natural disasters on the territory of the forest fund; elaborate and implement measures for protection of forest from illegal use; issue forest use tickets; implement activities related to defining areas for timber cutting including reviewing materials on areas designated for timber cutting submitted by forest users; if needed, conduct surveillance of the areas

⁶⁶ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

⁶⁷ Statute of Forest Policy Service, approved by Order N18 of the Ministry of Environment and Natural Resources Protection of 10 May 2013

designated for timber cutting and in case of revealed violations forward materials to the agency responsible for surveillance of license conditions; reveal administrative and criminal violations, other than related to implementing license conditions, and take further measures including informing relevant agencies; register, systematize and analyse revealed violations.⁶⁸

Agency of Protected Areas a legal entity of public law under Ministry of Environment Protection and Natural Resources of Georgia manages different category protected areas, develops corresponding management plans and monitors their implementation; manages natural resources within the protected areas and ensures their registration/inventory; organizes monitoring and scientific research and processes, stores and distributes obtained information; develops projects for establishing protected areas and for changing boundaries of protected areas; develops and implements measures for protection and restoration of species and habitats; participates in development of recommendations and programmes for improving flora and species composition, recovery-restoration, fire prevention, protection from pests and diseases including for forest resources; coordinates infrastructure and landscape planning; ensures development of ecotourism on protected area; runs GIS data bases related to protected areas; and other. The Agency implements protected area management through 22 PA territorial administrations throughout Georgia.⁶⁹

Service of Biodiversity Protection a structural unit of Ministry of Environment and Natural Resources Protection participates in development and implementation of national policy on protection of biodiversity components and management of biological resources; develops biodiversity strategy and action plan of Georgia and coordinates its implementation; organizes and coordinates state system of biodiversity monitoring. The Service of Biodiversity Protection is eligible to request information and materials from other state agencies needed for implementing their competences.⁷⁰ Service of Biodiversity Protection processes information received from state, non-governmental and other organizations on approved biodiversity indicators, and implements biodiversity monitoring.⁷¹

Service of Climate Change participates in development and implementation of the national strategy and policy on climate change; coordinates reporting to the UNFCCC in collaboration with relevant stakeholders; conducts regular national inventory of GHG and reports to the UNFCCC and other.⁷²

Department of Environmental Supervision a sub-agency structure of the Ministry of Environment and Natural Resources Protection implements state control in the field of environment protection and use of natural resources including biodiversity and forest protection and use of natural resources, and controls implementation of license conditions related to environment and natural resources use. The Department prevents, detects and suppresses illegal use of natural resources and pollution of the environment; controls implementation of conditions under licenses, including general license for forest use, special license for timber production and special license for hunting. The Department has eight territorial units throughout the Georgia.⁷³

Department of Licensing in the National Environmental Agency, a legal entity of public law under Ministry of Environment and Natural Resources Protection issues licenses for natural resources use (except from oil and natural gas), including licenses related to forest: general license for forest use; special license for timber production; and special license for hunting. The Department receives and processes all documentation submitted by license seekers and submits to structural sub-divisions and other agencies of the Ministry for their review; organizes field expeditions when needed; organizes auctions and ensures publishing corresponding information in printed media; establishes natural resources

⁶⁸ Statute of National Forest Agency, approved by Order N25 of the Ministry of Environment and Natural Resources Protection of 10 May 2013

⁶⁹ Statute of Agency of Protected Areas, approved by Order N3 of the Ministry of Environment and Natural Resources Protection of 10 May 2013

⁷⁰ Statute of Service of Biodiversity Protection, approved by Order N11 of Ministry of Environment and Natural Resources Protection of 10 May 2013

⁷¹ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

⁷² Statute of Service of Climate Change, approved by resolution N23 of Ministry of Environment and Natural Resources Protection of 10 May 2013

⁷³ Statute of Department of Environmental Supervision, a state sub-agency structure of the Ministry of Environment and Natural Resources Protection approved by Order N26 of Ministry of Environment and Natural Resources Protection of 10 May 2013

use quotas for license holders; runs registry on issued licenses; in case of violation of license conditions, develops proposals for defining necessary conditions to be implemented and corresponding reasonably time-frame for implementation; develops maps and registries on mineral deposits etc.⁷⁴

Environmental Information and Education Centre a legal entity of public law under Ministry of Environment and Natural Resources of Georgia is responsible for ensuring public access to environmental information, public participation in environmental decision-making and access to justice on environmental matters, as well as supporting public awareness raising and professional training of the staff from different stakeholder organizations. The Centre creates and administers unified environmental data base on environmental information in collaboration with other public, academic, educational, non-governmental, private and international organizations; collects and distributes environmental information; collects statistical data related to the environment; creates environmental library, including electronic materials; supports creation of the register on pollutant emission distribution; ensures public access to environment related information through the webpage and other electronic means as well as media; ensures public access to information on licenses and permits related to natural resources extraction and use; organizes training courses in the environmental sector for different target groups.⁷⁵

Council of National Security and Crisis Management is an advisory body under the Prime Minister. The permanent members of the Council are: Minister of Internal Affairs, Minister of Defence, Minister of Foreign Affairs, Minister of Finances, and Prime Minister – Head of Council and Assistant to Prime Minister in national security affairs – Secretary of the Council. Other sectoral Ministers and other state officials could be invited in the Council as needed. The council assesses internal and foreign threats; analyses key issues of internal and foreign policy directly related to the national security; organizes development of the national strategy in the field of foreign policy and security; controls activities of the Ministries and authorities of Autonomous Republics in the field of national defense and security; develops necessary measures to be implemented to reveal, neutralize and avoid threats; guides crisis management containing threat to national interests at the highest national level, and other.⁷⁶

Department of Emergency Management under the Ministry of Internal Affairs is responsible for coordinating actions for: emergency prevention and elimination, and mitigation of their consequences; ensuring fire safety in the country and implementing measures for emergency mobilization preparedness.⁷⁷ The Department develops emergency response measures and coordinates their implementation; manages unified emergency warning system; organizes state supervision of fire safety; supervises activities of local authorities in terms of fire preparedness and firefighting; together with other state agencies organizes activities for natural and man-made emergency prognosis; develops main directions of state policy in the field of fire safety and supervises their implementation; organizes state statistical system on fires, their consequences and emergency measures and develops state statistical reports.⁷⁸

According to the new Law on Public Safety of 29 May 2014, the Department of Emergency Management as well as relevant agencies at regional and local levels dealing with emergency situations has to be abolished before 1 November 2014 and a legal entity of public law Agency of Emergency Management under the Ministry of Internal Affairs has to be created. The Agency will ensure organizing emergency prevention, preparedness and response and restoration measures. The Agency also will be responsible for carrying out official statistics and reporting on fires and their consequences. The Agency will have structural units at regional and local levels.

⁷⁴ Statute of National Environmental Agency, approved by Order N27 of Ministry of Environment and Natural Resources Protection of 10 May 2013

⁷⁵ Statute of Environmental Information and Education Centre, approved by Order N6 of Ministry of Environment and Natural Resources Protection of 10 May 2013

⁷⁶ Statute of the Council of National Security and Crisis Management, approved by Resolution N38 of the Government of Georgia of 6 January 2014

⁷⁷ Statute of the Ministry of Internal Affairs, approved by Resolution N337 of the Government of Georgia of 13 December 2013

⁷⁸ Statute of the Department of Emergency Management approved by Order N994 of the Ministry of Internal Affairs of 31 December 2013

National Agency of Public Registry registers ownership rights and develops and updates real estate cadastre database.⁷⁹

Regional level

Authorities of Adjara and Abkhazia Autonomous Republics are responsible for managing forest on their territories and issuing forest use licenses.⁸⁰ Though currently there are no licenses issued on the territory of autonomous republics.

Adjara Autonomous Republic Forest Agency manages forest management within the borders of Adjara Autonomous Republic. The Agency is responsible for forest protection, tending and recovery; sustainable use of biodiversity components on the territory of the forest fund; supporting demarcation/adjustment of forest borders; managing forest fund; regulating forest use; forest inventory; implementing forest recovery measures; controlling territory of forest fund; implementing fire prevention and firefighting measures and other.⁸¹

Abkhazia Autonomous Republic Department of Agriculture, Environment and Natural Resources among other responsibilities collaborate with local, scientific and non-governmental organizations for forest sector development.⁸²

Local level

Local Self-Governance Authorities have a formal competency to manage forests of local importance.⁸³ They are responsible for: supporting implementation of forest tending, protection, restoration, and firefighting measures; issuing forest use tickets; submitting recommendations to the responsible national agency regarding restriction, suspension or termination of forest use rights on their territories; developing corresponding local programmes and supporting their implementation; participating in emergency response, and other.⁸⁴ However, as mentioned, due to lack of capacities and actual implementation mechanisms, there is no practice of local authorities implementing most of the forest management related competences. **Akhmeta Municipality Local Self-Governance** is responsible for managing Tusheti Protected Landscape. This is the only case when management of protected areas, including forest resources, is handed over to local authorities.

c. Forest information sharing (flows), use and nonuse among sectors / ministries and levels of government

Forest related data and information is generated in different state agencies. National Forest Agency is responsible for inventory and monitoring of the state forest fund, except forests in protected areas, forest of local importance and forest located within the boundaries of the Autonomous Republics. Agency of Protected Areas implements similar activities in protected areas, and Authorities of Autonomous Republics – within their territories.⁸⁵ Correspondingly, these agencies process and store all related data and information and provide data to other structural divisions and agencies under the Ministry of Environment and Natural Resources Protection upon formal written request, including the Forest Policy Service, Department of Licenses under National Environmental Agency, Department of Environmental Supervision, Service of Biodiversity Protection and others. The same agencies responsible for managing the forest fund are accountable for running electronic system on timber resources, in order to register use, transportation and primary processing of timber.⁸⁶ In addition, information obtained as a result of forest monitoring is submitted to the National Statistics Office of Georgia.⁸⁷

⁷⁹ Statute of National Agency of Public Registry approved by Resolution N835 of Ministry of Justice of Georgia of 19 July 2004

⁸⁰ Forest Code of Georgia, 22 June 1999

⁸¹ Statute of Adjara AR Forest Agency, approved by Resolution N55 of Adjara AR Government of 7 December 2010

⁸² Statute of Abkhazia AR Department of Agriculture, Environment and Natural Resources, approved by Resolution N23 of Abkhazia AR Government of 30 March 2007

⁸³ Organic Law of Georgia Code of Local Self-Governance, 5 February 2014

⁸⁴ Forest Code of Georgia, 22 June 1999, Article 13

⁸⁵ Forest Code of Georgia, 22 June 1999, Articles 15,16

⁸⁶ Forest Code of Georgia, 22 June 1999, Article 93¹

⁸⁷ Forest Code of Georgia, 22 June 1999, Article 25

Forest use planning is based on forest inventory and forest monitoring materials. On the basis of forest use planning 10-year forest management plans and forest use plans are developed. Forest management plans are developed by abovementioned state agencies. Forest use plans are developed by license holders.⁸⁸ Forest management plans and forest use plans are subject to public hearing, which is held by National Forest Agency. In addition, fixed time-frame is given to all stakeholders for submitting comments and suggestions. The Agency is obliged to provide all received comments on draft forest use plans to the license seeker.

As mentioned, forest use licenses are issued by Department of Licensing of the National Environmental Agency. However, object of licensing is prepared by the National Forest Agency. Preparing object of licensing includes description of the area; defining: area designated for timber cutting, tree species composition and supposed volume of timber; defining specific forest use type and rules; defining obligatory requirements to the license holder; preparing documentation for registering object of licensing in the public registry.⁸⁹ These materials are provided respectively to the Department of Licensing and the National Agency of Public Registry.

When needed, all forest related structural units and agencies of the Ministry can be involved in reviewing preliminary Environmental Impact Assessment report on specific activities subject to environmental permitting, and requested to submit comments.

All structural units of the Ministry are responsible for providing Department of Environmental Policy and International Relations information on international projects and related meetings and workshops, activities for meeting obligations under international conventions and related national reports.

All agencies responsible for managing the forest fund – regional units of the National Forest Agency and Agency of Protected Areas, local authorities and authorities of autonomous republics, in case of fire in the forest, are obliged to inform immediately relevant agencies and participate in emergency response. Regional units of the National Forest Agency, in case of revealed administrative and criminal violations on the territory of the forest fund, are obliged to inform Department of Environmental Supervision.

d. Overall assessment of the availability, quality and accessibility of forest-related data and information

There is no updated data on Georgian forests, so as regular forest inventory has not been undertaken since decades. Inventory has been undertaken only in areas leased for long-term use - approximately 160 thousand ha. The old data is not consistent with factual conditions, which creates significant barriers in planning rational and multifunctional use of forests.⁹⁰ Due to lack of data on forest conditions, before 2009 forest use licenses had been issued without prior forest inventory,⁹¹ which resulted in improper license conditions leading to unsustainable forest management and at the same time imposing financial risks to license holders. Due to lack of information on functional purpose and value of forest, in some cases, licenses have been issued for areas with high conservation value.⁹²

Lack of data is identified as a major barrier for biodiversity conservation and effective management of biological resources. It is difficult to reveal changes in species habitats and assess actual conditions and trends of biodiversity, so that there are no effective mechanisms for data collection, storing and analysis.⁹³

In addition, there is no reliable data on forest degradation and negative impacts on forest. National Biodiversity Strategy and Action Plan of Georgia 2014-2020 suggests, as one of the strategic approaches, carrying out inventory of forest areas that have been lost, degraded or changed as a result of

⁸⁸ Forest Code of Georgia, 22 June 1999, Article 24

⁸⁹ Law of Georgia on Managing of the Forest Fund, 6 July 2010, Articles 6, 13

⁹⁰ National Forest Concept of Georgia, approved by Parliament Resolution #1742-Is of 11 December 2013, Kutaisi, Georgia

⁹¹ M. Machavariani, Forest Management Standards and Practice in Georgia, Technical Report, 2010

⁹² WWF, Thematic Study for NBSAP 2014-2020 - Georgian Forest Biodiversity, Situation Analysis, 2012

⁹³ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012

infrastructural projects or mining, assessment of conditions of these areas and restoration based on landscape adaptation methods.

There is no reliable countrywide data on forest fires.⁹⁴ Official statistics does not include fires on lands outside forests and protected areas, while most of the fires in Georgia occur or originate from agricultural lands.

Georgia has prepared its Second National Communication to UNFCCC and the third Communication is on its way to finalization. National GHG inventory was undertaken as part of the Second Communication which included carbon removal by sinks from land use, land use change and forestry sectors. Changes in carbon stocks were examined by assessing: changes in forest and other woody biomass stocks; forest and grassland conversion to agricultural or other types of land; carbon uptake by the abandoned managed lands; and emissions and removals from soil. However, in most cases, due to lack of updated data it has not been possible to make assessments for recent years. Assessment of changes in forest and other woody biomass stocks was made based on forest classification on coniferous and deciduous, so that there is no detailed data on species composition. Still, calculations were made only for 1998-2002 years, so that there was no data on forest classification for more recent years. In addition, there is no data on conversion of forest and grassland to arable land to estimate annual losses of biomass. Though it is believed that there have not been large-scale conversions of different categories of land into arable land. Similarly, there is no data on changes in carbon stocks resulting from abandonment of cultivated arable land. Experts believe that this change has not been significant. CO₂ emissions and removals from soils are assessed based on changes in land use or changes in land cultivation. Changes in carbon stocks in arable land, pastures and hayfields, and mineral soils were also assessed only for 1998-2002, so as there is no data for more recent period.

There is need in improvement not only in terms of data generation but also access to data and public participation in forest related decision-making. Civil society sector currently does not have easy access to information on issued licenses and related materials. There has been reported cases NGOs having difficulty with obtaining public information related to implementing license conditions, forest use plans etc.⁹⁵

2. Baseline activities to strengthen forest data and information systems

National efforts

Forest sector has undergone reforms several times since the late 1990s. Several draft forestry reform concepts and draft national forest management policy documents were developed, but none of them was approved since recently. New National Forest Policy Document – the Forest Sector Concept was adopted by the Georgian Parliament in December 2013. The Concept aims at establishing sustainable forest management system that will ensure improvement of qualitative and quantitative indices of Georgian forests, biodiversity protection, efficient use of economic potential of forests taking into account their ecological value, public participation in forest management and equitable distribution of benefits.

Institutional setup of forest management has also undergone frequent changes. Due to last institutional reform in 2013 was established National Forest Agency, a legal entity of public law under the Ministry of Environment and Natural Resources Protection. Number of staff in the Agency has been increased up to 800 people. Number of rangers has been increased up to 569. Consequently, area to be observed by each ranger was decreased to 3000 ha. In the same year was created Service of Forest Policy within the Ministry, and a sub-agency structure of the Ministry – Department of Environmental Supervision. The aim of this reform was to separate competences and responsibilities related to forest management, protection, policy and legislative support.

Based on the National Forest Concept and the National Biodiversity Strategy and Action Plan 2014-2020, the Ministry of Environment and Natural Resources Protection, with support of GIZ, has launched National Forest Programme since spring 2013. Working groups have been created in several thematic

⁹⁴ UNECE, Second Environmental Performance Review for Georgia, 2010

⁹⁵ Forest Management in Georgia, Problems and Challenges, Association Green Alternative, 2012

areas, including forest monitoring and assessment. It is planned to develop and implement action plans in identified thematic areas. In addition, work on a New Forest Code will be started in 2014.

In order to create unified biodiversity monitoring system and to promote data exchange, the Ministry of Environment and Natural Resources Protection with financial support of GIZ has developed a Concept of National Biodiversity Monitoring System. The aim is to obtain adequate information on biodiversity conditions and trends, create response system and integrate this into national policies. 25 biodiversity indicators, including related to forest, grouped on the basis of State-Pressure-Response approach has been already selected. The indicators, methodologies for their description and related procedures are approved by Ministerial Order.⁹⁶ Currently data collection according to the selected indicators is ongoing.

Activities related to forest inventory, monitoring and assessment has been limited in Georgia. Forest inventory has not been undertaken since decades, except in areas licensed for long term use – approximately 160 thousand ha and in Racha Region where forest inventory was conducted in 2003-2007. At present inventory of up to 100 thousand ha is ongoing in Samtskhe-Javakheti region. Forest inventory was undertaken in Adjara in 2005-2006. However, the project was ceased before completion and the results have never been approved formally. Due to this, the results of this inventory, which already have become outdated, have never been used. There are plans to undertake new forest inventory in Adjara next year. In addition, demarcation of forest borders was undertaken in Adjara last year. Now formal approval of the newly defined borders is in process.

Inputs from International Projects

Ongoing project “Sustainable Forest Governance in Georgia: Strengthening Local and National Capacity and Developing Structured Dialogue” implemented by CENN (Caucasus Environmental NGO Network) aims at contributing to successful implementation of the forest reform in Georgia via strengthening the capacities of authorities and civil society and enhancing issue based policy dialogue. Among other activities the project initiated independent forest monitoring activities in regions in Georgia, which involves local non-governmental organizations, media and private sector that implement independent forest monitoring. In addition, in the framework of a pilot project component there is an idea to create forest portal and link it to already existing Geo-Portal.⁹⁷ In addition, CENN has been developing forest zoning directive together with the Ministry of Environment and Natural Resources Protection. When finalized, this document will become a formal forest zoning guideline.

ENPI East Countries FLEG II Program implemented by the World Bank in partnership with WWF and IUCN among other activities implements detailed forest inventory of Tianeti municipality. In addition, it is planned to create forest information database through development of Geo Portal for Georgian forests – “Geo Forest Portal” and forest Resource Center, which will be delivered to the National Forest Agency. Possibly Geo Forest Portal will be incorporated into disaster Geo Portal of Natural Hazards and Risks in Georgia developed by CENN.⁹⁸ Apart from this, FLEG implements forest functionality analysis that implies studying dependency of local population on forests. Maps reflecting results of this analysis will be developed for Ajameti, Kintrishi and Mtirala protected areas.

3. Ongoing challenges / barriers facing efforts to strengthen forest information systems

a. Overall barriers

National Forest Concept of Georgia (2013) among major challenges that forest sector faces today, lists unsustainable forest practice, imperfect legislation, weak institutions and enforcement, unduly consideration of different values of forest in planning and decision making, lack of finances and other factors. The Concept underlines that lack of updated forest data creates serious barriers in planning rational and multifunctional use of forest. Under necessary measures to define functional purpose and

⁹⁶ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

⁹⁷ Land Degradation Map of the South Caucasus Region, <http://land.cenn.org:8082/cenn/>

⁹⁸ <http://drm.cenn.org/index.php/en/>

values of forest in order to establish rational system of forest resources use, the Concept highlights a) forest inventory that ensures comprehensive determination of forest boundaries, conditions and basic qualitative characteristics/values of groves; b) categorization of forest according to their value and functional purpose; c) creating a system, which would enable responsible authorities as well as other stakeholders to implement monitoring of forests, the forest sector and ongoing processes. This system should be complementary to other systems, e.g. national biodiversity monitoring system. Additionally, the Concept emphasizes need in revealing degraded forest areas and areas subject to restoration and afforestation and planning and implementing corresponding measures.

Currently, updated data does not exist for the most part of the forest fund, as since last inventory, which took place decades ago, inventory and assessment of forest has been fragmented and covered mostly leased areas. Collecting baseline information on forest, which is necessary for planning and decision-making on forest use, and which would be a starting point for continuous monitoring of forest change dynamics, requires significant resources. Lack of resources, including financial, administrative and human resources is one of the biggest constraints for improvement of forest information systems. In addition to the sufficient number of qualified staff, there is need in expertise and methodologies to apply remote sensing data such as aerial and satellite information as a supportive tool to field work activities. Knowledge and skills in interpretation and analysis of remote sensing data is necessary not only for the staff of responsible agencies, but also for civil society organizations undertaking independent forest monitoring or other forest related activities.

In addition, currently there is no system or platform for consolidating forest related data and information generated within the responsible agencies or as a result of activities implemented and funded by international donors, NGOs or other organizations. Correspondingly there is no system facilitating data sharing between state agencies as well as all other stakeholders and enabling easy public access to forest related information.

b. Barriers related to use scenarios described in section 8 below

Limited baseline data and information on forest conditions can be a barrier for forest monitoring and assessment activities. Baseline data is needed in order to observe forest change dynamics and to measure level of degradation or improvement. Forest monitoring is based on forest management plans and forest use plans, which are developed on the basis of forest inventory. As mentioned, forest inventory data is very limited and mostly outdated in Georgia.

In addition, forest degradation in Georgia is mainly related to decrease of forest density. There is no large-scale clear-cut logging or any other types of degradation, which would be easily identifiable on average resolution satellite images. Existing degradation is more difficult to detect at the given resolution provided on the global forest watch website.

Forest and other fires in Georgia are mostly small scale and don't last long, which makes them harder to detect via satellite observation.

Another barrier could be lack of expertise and methodologies for interpreting remote sensing data. Relevant staff in the responsible agencies will need adequate training in data interpretation in order to be able to use satellite information and integrate relevant tools in their daily work.

Additionally, language barrier, lack of ownership or other barriers can make GFW website less usable for the responsible staff. In order to ensure sustainability of the efforts to improve data and information, and ensure that these data are regularly updated and used in planning and decision-making, there is need in creating national data portal, which would be managed and regularly updated by a responsible state agency.

4. Assessment of potential utility / applicability of Global Forest Watch (GFW) to baseline situation

As mentioned, financial, administrative and human resources are among the major constraints for improving forest data and information in Georgia. Global Forest Watch efforts can contribute to the improved forest data; help to create additional data generation and monitoring tools; and support establishing regularly updated data system shared by different stakeholders.

GFW activities can support implementing measures, which are required by the national forest legislation but have not been implemented due to lack of resources. Among these are: update/adjustment of forest boundaries; support functional categorization of forest; support revealing degraded areas subject to restoration and reforestation; support data gathering on forest related biodiversity indicators; support forest assessment and monitoring including in areas which are difficult to access; assist forest inventory in terms of identifying areas for field studies and, in some cases, providing additional data to the field materials; support better management of leased areas; support better management of protected areas and expansion of protected area network; contribute to better forest fire information for better fire management, including identification of fire prone areas and planning fire prevention measures; contribute to accurate, updated data on forest annual increment of timber, and other data needed to assess changes in forest and other woody biomass stocks and to calculate corresponding carbon removal for reporting to UNFCCC, as well as for further planning, implementation and monitoring, including for Low Emission Development Strategy.

Transferring expertise and methodologies in interpretation and analysis of remote sensing data will have long-term benefit for responsible agencies and other stakeholders, so that they can successfully apply this knowledge in the future, when there are other opportunities for obtaining satellite or aerial photos (e.g. National Public Registry is planning to produce high resolution aerial photographs for the whole country).

In addition to lack of data, existing data and information is not always easily accessible, and often is dispersed in different organizations. As mentioned in chapter 3.a), National Forest Concept of Georgia underlines need in a system, enabling responsible authorities as well as other stakeholders to implement monitoring of forests, the forest sector and ongoing processes, which would be complementary to other systems, e.g. national biodiversity monitoring system. Apart from this, creation of a broader national environmental database has been already planned and initial efforts have been already made by responsible agencies. GFW can contribute to this portal by supporting creation of forest related data layers. The responsible agency – Environmental Information and Education Centre will ensure maintenance and regular update of the database, as well as providing needed information to the global GFW website. The planned database is envisaged to have different data sharing levels and will facilitate both, inter-agency data sharing and public access to environment related information. The data portal can incorporate other databases developed as a result of earlier efforts, including GEO Portals developed by CENN and IUCN. This will ensure sustainability of already undertaken efforts and will help to consolidate all existing data. In addition, the Centre has a formal responsibility to ensure public access to information concerning environment and natural resources related permits and licenses. Information on forest use licenses could be incorporated into the forest data portal and also uploaded on the GFW website.

II. Project design considerations / use cases

Use case title:	1 Management of production forests
Area(s) of geographic focus (if any):	Areas with potential economic value (which potentially can be leased); Areas under lease and adjacent areas
Problems / challenges / issues that GFW may help to address ⁹⁹ :	<p>Unsustainable use of forest has been a significant problem for last 20 years in Georgia. Due to lack of monitoring and enforcement capacity there is limited information on forest conditions, including in leased areas. In addition, illegal logging rate is still high, despite its significant decrease during last years. It has been observed that logging rate exceeds natural regeneration rate in forests adjacent to settlements, causing significant reduction of forest density¹⁰⁰. Often higher forest degradation is observed in areas adjacent to leased territories than in the leased territories¹⁰¹. In this case more complete and verified information would help to analyse causes and prevent further degradation.</p> <p>Lack of reliable information on forest condition and forest categories prevent proper planning of sustainable forest management. Before 2009 forest use licenses had been issued without prior forest inventory.¹⁰² This resulted in improper license conditions imposing financial risks to license holders. Furthermore, even though license holder is responsible for forest protection and restoration measures, due to lack of knowledge these measures often are not implemented properly.¹⁰³ In addition, in some cases licenses have been issued for areas with high conservation value¹⁰⁴, so that due to lack of data, categorization of forests according to their functional purpose and value has not been undertaken.</p> <p>Public information and participation in decisions on forest is very important for sustainable forest management. Civil society sector currently does not have easy access to information on issued licenses and related materials. There has been reported cases NGOs having difficulty with obtaining public information related to implementing license conditions, forest use plans etc.¹⁰⁵</p>
Initial conclusions from GFW re. historic baseline and trend / scenario: ¹⁰⁶	<p>Satellite images show increasing forest degradation in certain areas in Georgia through the period of 2001-2013. However, providing that there is no large-scale clear cut logging, but mostly selective logging in Georgia, not all present degradation could be detected at the given resolution.</p> <p>According to national reports in 55% of forests due to intensive forest use stand density is alarmingly low (canopy density is 50% and less).¹⁰⁷</p>
Current activities / efforts to address problem (including Government, civil society and donor	Forest management sector has undergone frequent institutional changes through last years. Due to the last institutional reform in 2013, National Forest Agency, a legal entity of public law under the Ministry of Environment and Natural Resources Protection was created. Number of staff in the Agency has been increased up to 800 people. Number of rangers has been increased up to 569. Consequently, area to be

⁹⁹ Use 'initial thoughts' column in Table 2.4 as a starting point from which to build this description

¹⁰⁰ National Biodiversity Strategy and Action Plan 2014-2020, approved by Government Resolution N343 of 8 May 2014

¹⁰¹ Irakli Macharashvili, Association Green Alternative, personal interview 11 July 2014

¹⁰² M. Machavariani, Forest Management Standards and Practice in Georgia, Technical Report, 2010

¹⁰³ National Biodiversity Strategy and Action Plan 2014-2020, approved by Government Resolution N343 of 8 May 2014, Tbilisi, Georgia

¹⁰⁴ WWF, Thematic Study for NBSAP 2014-2020 - Georgian Forest Biodiversity, Situation Analysis, 2012

¹⁰⁵ Forest Management in Georgia, Problems and Challenges, Association Green Alternative, 2012

¹⁰⁶ For site-based cases, a GFW-generated map should be attached

¹⁰⁷ WWF, Thematic Study for NBSAP 2014-2020 - Georgian Forest Biodiversity, Situation Analysis, 2012

support, as relevant), including the [process](#) into which GFW would fit.¹⁰⁸

Description of relevant baseline data layers:

Description of key stakeholders / potential partners:

observed by each ranger was decreased to 3000 ha. In the same year was created Service of Forest Policy within the Ministry, and a sub-agency structure of the Ministry – Department of Environmental Supervision. The aim of this reform was to separate competences and responsibilities related to forest management, protection, policy and legislative support.

Georgian Parliament adopted New National Forest Policy Document (Forest Sector Concept) in December 2013, which significantly changed approach to forest management. The aim of the Concept is to establish sustainable forest management system that will ensure improvement of qualitative and quantitative indices of Georgian forests, biodiversity protection, efficient use of economic potential of forests taking into account their ecological value, public participation in forest management and equitable distribution of benefits.

Lack of forest related data is one of the challenges in the forest management sector in Georgia. Last forest inventory was undertaken decades ago. Inventory has been undertaken only in areas leased for long-term use - approximately 160 thousand ha. In total 180 Thousand ha is under licensed use currently.

Forest cover – tree cover extent; intact forest landscapes

Forest change – loss and gain

Forest use – areas licensed for logging; forest use plans and related data; areas that could be potentially leased; areas licensed for mining.

Conservation – Protected Areas

Land use – agricultural, non-agricultural, areas covered by forest, areas not covered by forest

Land ownership

Land degradation

National level

- **Forest Policy Service**
- **National Forest Agency**
- **Department of Licensing in the National Environmental Agency,**
- **Department of Environmental Supervision**
- **Environmental Information and Education Centre**
- **National Agency of Public Registry**

Regional level

- **Authorities of Adjara and Abkhazia Autonomous Republics**

Local level

- **Local Self-Governance Authorities**

Non-Governmental Organizations

- **CENN project “Sustainable Forest Governance in Georgia: Strengthening Local and National Capacity and Developing Structured Dialogue”** aims at contributing to successful implementation of the forest reform in Georgia via strengthening the capacities of authorities and civil society and enhancing issue based policy dialogue. Among other activities the project initiated independent forest monitoring activities in regions in Georgia, which involves local non-governmental organizations, media and private sector that implement independent forest monitoring. In addition, CENN has been developing forest-zoning directive together with the Ministry of Environment and Natural Resources Protection, which is supposed to become a formal forest zoning guideline.

¹⁰⁸ This should include data and information systems / process currently in place related to action.

Proposed GEF project activities to use GFW to address problem / challenge, including co-ordination and harmonization with baseline data and information systems and efforts:

Association Green Alternative has been actively involved in the processes related to biodiversity protection and forest. The organization has prepared number of publications related to forest governance, forest policy and legislation analysis, forest sector monitoring, public participation in forest management etc. through last years.

1) Functional categorization of forest

It has been fully recognized by the national authorities that categorization – functional zoning of forest is essential for their protection and sustainable, multifunctional use. According to the National Forest Concept of Georgia, significant part of the forests with high conservation value does not have status of protected forest and there is no categorization based on functional purpose of forest. Accordantly, existing forest management system does not comply with modern principles of sustainable forest management and ecosystem approach.¹⁰⁹

Improved management of production forests could be achieved through identifying areas of high conservation and other values, where forest use should be restricted. Forest with high conservation value, ecological corridors and intact forest should be revealed and mapped. This will help to identify areas where commercial logging should be restricted.

2) Monitoring/assessment of leased areas

Satellite data as well as baseline data could be used for analysing historic and more recent information on leased areas in order to undertake impact analysis of forest use. As a result of the assessment, efficiency of applied forest logging methods could be evaluated and the best practices revealed.

In addition, there will be need in developing methodologies for data interpretation, sampling, and extrapolation and producing monitoring and assessment tools adapted for Georgia. Furthermore, there will be need in capacity building, trainings and consultations for responsible agencies.

3) Surveillance of License Conditions

Department of Environmental Supervision, responsible for surveillance of license conditions related to forest use, can use the satellite data for general observation of forest and fragmented areas. Such observation could become a ground for planning surveillance. Satellite observation will make possible to observe forest change dynamics in time, and also to observe remote, not easily accessible areas. Higher resolution would enable more precise observation. Such observation is more suitable for monitoring of the general situation than for revealing cases of illegal logging.

There is high need in GIS compatible data processing software in the Department, which would make easier to facilitate surveillance field works in forest. This could include data on areas designated for timber cutting, calculation of volumes, in some cases identifying species by photos. Maps of the areas designated for timber cutting with area coordinates and other data, such as species composition and tree diameters should be attached to the software program. All this work is presently conducted on paper which is rather time consuming and inaccurate.

4) Public information and participation

Production forest management related data could become part of the national environmental data portal incorporating all available forest related information to be managed and updated by Environmental Information and Education Centre (discussed more broadly below in use case 3). This could include regularly updated information on issued licenses and related materials such as: names of license holder companies, forest use plans and maps of leased areas. This information together with satellite data on forest cover and forest change will help NGOs to undertake alternative monitoring of leased areas and will enable them to participate more actively in forest management related decision making. With different levels of data access, the data portal can become an effective tool for data and information sharing between responsible agencies at the same time facilitating public access to all available forest related information.

¹⁰⁹ National Forest Concept of Georgia, approved by Parliament Resolution #1742-Is of 11 December 2013, Kutaisi, Georgia

Assessment of possible need for higher resolution data:	Higher resolution data is needed to observe smaller scale logging and degradation.
Inputs / projected costs ¹¹⁰ :	
Targets and indicators, including specific biodiversity, carbon and land degradation-related benefits, where appropriate ¹¹¹	To be added later

¹¹⁰ Typical use case demonstrations may typically range from \$50-100,000

¹¹¹ These will be combined and incorporated into tracking tools

Use case title:	2 Forest Fire Alert System
Area(s) of geographic focus (if any):	Countrywide (could be identified pilot regions with higher risk of fires)
Problems / challenges / issues that GFW may help to address ¹¹² :	<p>It has been recognized that fires have become an increasing threat to forests, protected areas and other vegetation resources in Georgia due to climate change and certain land use patterns. Even though the annual average number and extent of forest fires for the last decade is believed to be moderate, some large fires in recent years – 2006 (765 ha), 2008 (1270 ha)¹¹³ and 2010 (430 ha) reveals the high risk of larger scale fire disasters during dry seasons.¹¹⁴ In total 2005 ha forest has been degraded during last 3-4 years due to forest fires.¹¹⁵</p> <p>Still, there is no reliable countywide data on forest areas, forest stock and forest fires.¹¹⁶ In addition, official statistics does not include fires on lands outside forests and protected areas, while most of the fires in Georgia occur or originate from agricultural lands. At the same time, there is no regulatory framework for the use of fire in agricultural purposes, which makes this type of fires difficult to manage. Additional threats arise from remnants of military activities such as unexploded ordnance. Fires on these terrains contain high risk for civilians and fire fighters.¹¹⁷</p> <p>In overall, national capacities in fire management in terms of both, fire prevention and response needs strengthening. This include lack of comprehensive regulatory requirements, lack of resources to properly manage fires in the regions, limited technical and human resources to fight fires in areas which are not easily accessible, limited capacity for fire research, need in strengthening inter-agency coordination for effective fire management etc.</p>
Initial conclusions from GFW re. historic baseline and trend / scenario: ¹¹⁸	It could be seen on the GFW website that fires in Georgia mostly occur in areas not covered by forest and agricultural lands. In addition, fires in Georgia are mostly small scale and short, due to which, not all fires could be detected by the satellite.
Current activities / efforts to address problem (including Government, civil society and donor support, as relevant), including the process into which GFW would fit: ¹¹⁹	<p><i>National efforts</i></p> <p>National strategic documents such as the second National Environmental Action Programme of Georgia 2012-2016 (NEAP) and the second National Biodiversity Strategy and Action Plan of Georgia 2014-2020 (NBSAP) recognize forest fires as significant threat to forest ecosystems and protected areas. It is underlined that even though some efforts has been made to strengthen national fire management capacities, existing early warning and fire management systems are not effective. Both national documents outline urgent need in measures to protect forest from fires in order to achieve more sustainable forest management.</p> <p>The Government has been trying to improve national legal framework in disaster preparedness. Number of laws and regulations has been developed in the last few years and many of them have been abolished in a short time. Presently major laws in force, regulating emergency response are the Law of Georgia on Public Safety of 29 May 2014</p>

¹¹² Use 'initial thoughts' column in Table 2.4 as a starting point from which to build this description

¹¹³ This does not include forest areas burnt due to military activities during the 2008 war

¹¹⁴ Proposal for a National Fire Management Policy of Georgia, ENVSEC project "Enhancing National Capacity on Fire Management and Wildfire Disaster Risk Reduction in the South Caucasus"

¹¹⁵ National Biodiversity Strategy and Action Plan 2014-2020, approved by Government Resolution N343 of 8 May 2014

¹¹⁶ UNECE, Second Environmental Performance Review for Georgia, 2010

¹¹⁷ Proposal for a National Fire Management Policy of Georgia, ENVSEC project "Enhancing National Capacity on Fire Management and Wildfire Disaster Risk Reduction in the South Caucasus"

¹¹⁸ For site-based cases, a GFW-generated map should be attached

¹¹⁹ This should include data and information systems / process currently in place related to action.

and National Response Plan on Natural and Man-made Emergency Situations approved by Presidential Ordinance N415 of 26 August 2008. The latter is a set of emergency plans of the Ministries and their sub-ordinate agencies aiming at protecting civilians and territories from natural and man-made emergency situations. Traditionally, laws and regulations related to emergency situations in Georgia have been more focused on emergency response rather than prevention and mitigation. Institutional setup of emergency response has been also undergoing changes during last years and some more changes are coming in a short term (see below).

Inputs from international projects

In the framework of the project funded by Caucasus Nature Fund established in 2006, Borjomi-Kharagauli National Park was equipped by fire-fighting equipment.¹²⁰

The ongoing project of Environment and Security (ENVSEC) Initiative: Phase Three - Enhancing National Capacity on Fire Management and Wildfire Disaster Risk Reduction in the South Caucasus" works on improving the capacity of countries to efficiently respond to the wildfires and improve forest fire management in order to achieve the major objective of the project - reducing wildfire risks in the South Caucasus. Five national roundtables on fire management were held between 2007 and 2014 concerning the future scope of fire management in Georgia. Key stakeholders from the Georgian agencies directly and indirectly responsible in forest and land management, fire protection and emergency response, as well as representatives of academia, local communities and civil society organizations, with support by international experts, were involved in these consultations and confirmed these observations.

In addition, Proposal for a National Fire Management Policy of Georgia was developed in March 2014 in the framework of the same project. The document identifies six main areas of activities/measures to address current gaps and shortcomings in national fire management. Among others these include:

Monitoring, early warning, information and analysis

This implies addressing lack of regional and local data on fires and their magnitude. Strategic objectives include not only fire management but post-fire vegetation management; establishment and maintaining a national database, fire monitoring and early warning capacity; establishing advanced satellite and weather forecast data based fire early warning and monitoring capabilities at national level; supporting responsible agencies in fire risk assessment.

Reduction of fire hazard, risk and vulnerability, and prevention of uncontrolled fires

This includes better management of uncontrolled fires, which are mostly human induced and relate to agricultural activities; and addressing risks arising from areas containing remnants from military activities, such as unexploded land mines.

Preparedness: Provisions to improve fire response and safety

Preparedness includes improving the ability for early warning, rapid detection and reporting of uncontrolled fires.

Additionally, the document identifies among urgent priority actions use of Earth Observation products – open-source satellite-derived data and information to monitor forests and other vegetation cover to build capacities in near-real time detection, monitoring and impact assessment of fires. Furthermore, it underlines necessity in creating inter-agency coordination mechanism to secure harmonization, coordination and cooperation in fire management at all levels.

Description of relevant baseline data layers:

Active fires

Possible additional layers for the national data portal:

Land use (with indication of agricultural and non-agricultural land, land covered by forest and land not covered by forest)

Fire prone areas

Areas repeatedly subject to burning for agricultural purposes

Areas containing remnants of military activities such as unexploded ordnance.

¹²⁰ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012

Description of key stakeholders / potential partners:

Proposed GEF project activities to use GFW to address problem / challenge, including co-ordination and harmonization with baseline data and information systems and efforts:

	<p><i>National Level</i></p> <ul style="list-style-type: none"> • Council of National Security and Crisis Management • Department of Emergency Management • National Forest • Agency of Protected Areas <p><i>Regional level</i></p> <ul style="list-style-type: none"> • Adjara Autonomous Republic Forest Agency <p><i>Local level</i></p> <ul style="list-style-type: none"> • Local Self-Governance Authorities <p><i>International Projects</i></p> <ul style="list-style-type: none"> • ENVSEC project “Enhancing National Capacity on Fire Management and Wildfire Disaster Risk Reduction in the South Caucasus” aims at improving the capacity of Southern Caucasus countries to efficiently respond to the wildfires and improve forest fire management in order to reduce wildfire risks. Five national roundtables have been held in the framework of the project concerning the future scope on fire management in Georgia. In addition, proposal for a National Fire Management Policy of Georgia was developed in March 2014.
	<p><i>Information for analysis and prevention</i></p> <p>Generally in Georgia there is lack of reliable statistical data on fires and their origin. Human induced fires related to agriculture activities are not recorded at all and there are no regulatory requirements for their management, while this type of fires constitute majority of uncontrolled fires in the country.</p> <p>Development of a nationally based updated database on fires (a part of the broader environmental data portal discussed in use case 3), which would mirror globally managed GFW website, would reduce and eliminate gaps in regional and local data on fires, their extent and consequences. Consolidated data would enable to study and analyse origin of fires, identify fire prone areas and based on this, implement fire prevention measures. Maps with indication of land use, including areas covered by forest, areas not covered by forest and agricultural lands would help to identify origin and cause of fires. As mentioned, vast majority of fires in Georgia originate from burning in agricultural fields. Prior mapping of such areas, where agriculture induced burning is likely to occur, would help to analyse risks and plan corresponding measures in case of satellite detection of such fires. This would also help to better control agriculture induced burning activities in case there is any regulatory mechanism in place, such as for example prior voluntary reporting or permits.</p> <p>In addition, to the maps could be added areas with remnants of military activities, such as unexploded ordnance. This would help to analyse possible risks and plan precautionary measures to protect civilians as well as fire teams during fire elimination activities.</p> <p><i>Early detection</i></p> <p>Early detection is a key for effective elimination of fires minimizing risks and damage to humans and the environment. Satellite information when downloaded and analysed daily, could become a part of the national fire detection system, complementing already existing practices. For areas with high risks of fires, especially during dry seasons, higher resolution and more frequently updated data could be provided. Prior identification of fire prone areas and classification of forests in terms fire risks, as well as identifying time periods with high probability of fire occurrence, would help to plan national level activities, such as ground patrolling or aerial surveillance for rapid detection of fires in regions with high fire risks especially during dry seasons. Maps indicating land use patterns and probability for agriculture induced burning could help to analyse early detection information, establish source and type of fire and plan needed response</p>

	<p>measures more effectively.</p> <p><i>Inter-Agency Coordination</i> Creation of a regularly updated nationally managed data portal consolidating all forest fire related data and information would improve data and information sharing between relevant state agencies. Providing that the data portal is planned to have different access levels, it could contain data for limited interagency use, as well as publicly accessible data available for all users. This will allow the national agencies to share and exchange specific data and information, which would contribute to improving inter-agency coordination.</p>
Assessment of possible need for higher resolution data:	<p>Fires occurring in Georgia are mostly small scale. Higher resolution and more frequently updated data are needed for more accurate detection of fires.</p>
Inputs / projected costs ¹²¹ :	<p>...</p> <p>Nationally based data portal could be supported by the Center for Environmental Information and Education, a legal entity of public law under the Ministry of Environment and Natural Resources Protection. Development and maintenance of the database would not incur additional costs, so that this could be added to already ongoing and planned activities of the Center, such as development of a national data portal compiling all environment related data and information. In addition, the Ministry of Finances of Georgia ensures technical support to the data portal, such as maintenance of the server and other activities.</p>
Targets and indicators, including specific biodiversity, carbon and land degradation-related benefits, where appropriate ¹²²	<p>To be added later</p>

¹²¹ Typical use case demonstrations may typically range from \$50-100,000

¹²² These will be combined and incorporated into tracking tools

Use case title:

Area(s) of geographic focus (if any):

Problems / challenges / issues that GFW may help to address¹²³:

Initial conclusions from GFW re. historic baseline and trend / scenario:¹²⁷

Current activities / efforts to address problem (including Government, civil society and donor support, as relevant), including the process into which GFW would fit:¹²⁸

3 Forest assessment / inventory / monitoring

Countrywide (with possible pilot areas)

There is no updated data on Georgian forests, so as regular forest inventory has not been undertaken since decades. The old data is not consistent with factual conditions, which creates significant barriers in planning rational and multifunctional use of forests.¹²⁴ Regular forest monitoring is needed to enable rational forest use and assessment of forest use effects as well as changes in the environment.

Even though Georgia is rich in forest resources, average density of significant part of the forests is at critical level. Further degradation could cause sharp decline in protection functions and self-restoration ability, which in medium and long term could lead to irreversible degradation of forest ecosystems.¹²⁵ Updated data on forest conditions is necessary to assess forest change patterns and effectively address major factors having negative effect on forests – unsustainable forest use, overgrazing, pests and diseases and forest fires, as well as to adequately plan forest recovery measures. In addition, updated information on forests will help to properly consider forest ecosystem requirements in development planning. Large infrastructural projects are identified as one of the causes of forest degradation in Georgia¹²⁶ and with future increase of economic activity negative impacts on forest ecosystems will increase, unless better monitoring and planning system is established.

Satellite images on GFW website and layers indicating forest cover and forest change show increasing forest degradation in certain areas. However, providing that forest degradation in Georgia more relates to decline in forest density rather than massive degradation of large areas, degradation extent might be greater than could be observed on the website.

National efforts

Forest sector has undergone reforms several times since the late 1990s. Several draft forestry reform concepts and draft national forest management policy documents were developed, but none of them was approved since recently. New National Forest Policy Document – the Forest Sector Concept was adopted by the Georgian Parliament in December 2013. The Concept aims at establishing sustainable forest management system that will ensure improvement of qualitative and quantitative indices of Georgian forests, biodiversity protection, efficient use of economic potential of forests taking into account their ecological value, public participation in forest management and equitable distribution of benefits.

¹²³ Use 'initial thoughts' column in Table 2.4 as a starting point from which to build this description

¹²⁴ National Forest Concept of Georgia, approved by Parliament Resolution #1742-Is of 11 December 2013, Kutaisi, Georgia

¹²⁵¹²⁵ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012

¹²⁶ National Biodiversity Strategy and Action Plan 2014-2020, approved by Government Resolution N343 of 8 May 2014

¹²⁷ For site-based cases, a GFW-generated map should be attached

¹²⁸ This should include data and information systems / process currently in place related to action.

Institutional setup of forest management has also undergone frequent changes. Due to last institutional reform in 2013 was established National Forest Agency, a legal entity of public law under the Ministry of Environment and Natural Resources Protection.

Based on the National Forest Concept and the National Biodiversity Strategy and Action Plan 2014-2020, the Ministry of Environment and Natural Resources Protection, with support of GIZ, has launched National Forest Programme since Spring 2013. Working groups have been created in several thematic areas, including forest monitoring and assessment. It is planned to develop and implement action plans in identified thematic areas. In addition, work on a New Forest Code will be started in 2014.

In order to create unified biodiversity monitoring system and to promote data exchange, the Ministry of Environment and Natural Resources Protection with financial support of GIZ has developed a Concept of National Biodiversity Monitoring System. The aim is to obtain adequate information on biodiversity conditions and trends, create response system and integrate this into national policies. 25 biodiversity indicators, including related to forest, grouped on the basis of State-Pressure-Response approach has been already selected. The indicators, methodologies for their description and related procedures are approved by Ministerial Order.¹²⁹ Currently data collection according to the selected indicators is ongoing.

Activities related to forest inventory, monitoring and assessment has been limited in Georgia. Forest inventory has not been undertaken since decades, except in areas licensed for long term use – approximately 160 thousand ha and in Racha Region where forest inventory was conducted in 2003-2007. At present inventory of up to 100 thousand ha is ongoing in Samtskhe-Javakheti region.

Forest inventory had been undertaken in Adjara in 2005-2006. However, the project was ceased before completion and the results have never been approved formally. Due to this, the results of this inventory, which already have become outdated, have never been used. There are plans to undertake new forest inventory in Adjara next year. In addition, demarcation of forest borders was undertaken in Adjara last year. Now formal approval of the newly defined borders is in process.

Inputs from International Projects

Ongoing project “Sustainable Forest Governance in Georgia: Strengthening Local and National Capacity and Developing Structured Dialogue” implemented by CENN (Caucasus Environmental NGO Network) aims at contributing to successful implementation of the forest reform in Georgia via strengthening the capacities of authorities and civil society and enhancing issue based policy dialogue. Among other activities the project initiated independent forest monitoring activities in regions in Georgia, which involves local non-governmental organizations, media and private sector that implement independent forest monitoring. In addition, in the framework of a pilot project component there is an idea to create forest portal and link it to already existing Geo-Portal.¹³⁰ In addition, CENN has been developing forest zoning directive together with the Ministry of Environment and Natural Resources Protection. When finalized, this document will become a formal forest zoning guideline.

ENPI East Countries FLEG II Program implemented by the World Bank in partnership with WWF and IUCN among other activities implements detailed forest inventory of Tianeti municipality. In addition, it is planned to create forest information database through development of Geo Portal for Georgian forests – “Geo Forest Portal” and forest Resource Center, which will be delivered to the

¹²⁹ Order N262 of Ministry of Environment and Natural Resources Protection of 18 December 2012 on approving indicators for unified system of biodiversity monitoring and related methodologies and procedures

¹³⁰ Land Degradation Map of the South Caucasus Region, <http://land.cenn.org:8082/cenn/>

Description of relevant baseline data layers:	<p>National Forest Agency. Possibly Geo Forest Portal will be incorporated into disaster Geo Portal of Natural Hazards and Risks in Georgia developed by CENN.¹³¹ Apart from this, FLEG implements forest functionality analysis that implies studying dependency of local population on forests. Maps reflecting results of this analysis will be developed for Ajameti, Kintrishi and Mtirala protected areas.</p> <p>Forest cover – tree cover extent; intact forest landscapes Forest change – loss and gain Forest use – areas licensed for logging and mining Conservation – Protected Areas Land use – agricultural, non-agricultural, areas covered by forest, areas not covered by forest Land ownership Land degradation</p>
Description of key stakeholders / potential partners:	<ul style="list-style-type: none"> • Forest Policy Service • National Forest Agency • Agency of Protected Areas • Service of Biodiversity Protection • Environmental Information and Education Centre <p><i>Regional level</i></p> <ul style="list-style-type: none"> • Adjara Autonomous Republic Forest Agency • Abkhazia Autonomous Republic Department of Agriculture, Environment and Natural <p><i>Local level</i></p> <ul style="list-style-type: none"> • Local Self-Governance Authorities <p><i>International Projects and Non-Governmental Organizations</i></p> <ul style="list-style-type: none"> • ENPI East Countries FLEG II Program implemented by the World Bank in partnership with WWF and IUCN • CENN project “Sustainable Forest Governance in Georgia: Strengthening Local and National Capacity and Developing Structured Dialogue” • Other non-governmental organizations that could be potential stakeholders and users or contributors to the forest data portal are NACRES and Green Alternative.
Proposed GEF project activities to use GFW to address problem / challenge, including co-ordination and harmonization with baseline data and information systems and efforts:	<p><i>Forest monitoring/assessment</i></p> <p>GFW satellite data can be used for observing forest dynamics and implementing forest-monitoring activities. This includes: update and adjustment of borders of the forest fund, last defined in 2011; identifying and mapping different land use types: areas covered by forest and areas not covered by forest; agricultural land and non-agricultural land; forest under licensed use and other. Based on these data forest change dynamics – forest gain and forest degradation over time could be observed and different causes of degradation such as logging, pests and diseases, fires, overgrazing and other could be identified, analysed and addressed. In addition, natural succession of forest on former agricultural land could be studied and analysed. Correct land use information will improve land use planning and control of non-authorized activities e.g. construction within borders of the forest funds. Observation of forest change dynamics will also help to</p>

¹³¹ <http://drm.cenn.org/index.php/en/>

analyse impacts of climate change on forests and its possible consequences. Furthermore, tourist routes and tourist infrastructure could be planned. Satellite data could also enable to monitor forest in Abkhazia AR in order to assess forest conditions and support better management at regional and local levels.

This will also help to gather data for forest related biodiversity indicators such as: landscape fragmentations, area designated for timber cutting, intensity of forest use, forest diseases and forest fires, intact forests and other.

Forest zoning could be undertaken based on the forest-zoning directive under elaboration presently. Higher resolution images could allow studying species composition based of which forest grove plans could be developed. Pilot priority areas could be identified for higher resolution data, e.g. ecological corridors and floodplain and further, conservation plans for important corridors could be developed. Possible priority areas could be identified in Racha, Svaneti, Samtskhe-Javakheti regions, akhmeta and Tianeti municipalities.

In addition, satellite data could assist forest inventory process in terms of planning and better identifying areas for field studies, and in some cases providing additional data. E.g. ways could be identified to use satellite data as an additional tool to support planned forest inventory in Adjara. In addition, annually updated satellite information will be very important to see further change dynamics.

Expertise/methodologies in data interpretation and analysis

There will be need in methodologies in data interpretation and analysis for application of satellite images for data generation and analysis. Corresponding trainings will be needed for public officials as well as NGOs implementing independent forest monitoring or other forest related activities and possibly also for representatives of general public involved in such activities. This will have long term sustainable benefit so as knowledge and expertise will remain in the beneficiary agencies and could be successfully applied when there are other possibilities of using satellite or aerial images.

Interagency data sharing/public access to information

As mentioned, there is lack of updated forest related data in Georgia. In addition, existing information is not always easily accessible, and while forest management often affects multiple sectors, there is no mechanism for inter-sectoral data sharing. Furthermore, information and data produced as a result of efforts undertaken at different times by national institutions as well as international projects or NGOs, needs to be consolidated in order to ensure sustainability of these efforts and to help to provide broader picture based on consolidated information.

In order to address all this issues, there is need in national data portal that would gather all forest related information and that would be updated regularly by a responsible agency, including by using GFW satellite information. The data portal could mirror the GFW website in many aspects, and in some cases automatic parallel update could be arranged for selected data layers.

Forest data portal could be incorporated and become part of the broader environmental database to be developed by Environmental Information and Education Centre. The Ministry of Finances is planned to provide technical support for the database and provide a server with a backup system that excludes loss of data. Environmental Information and Education Centre will ensure maintenance and regular update of the database, as well as providing needed information to the global GFW website. The planned database is envisaged to have different data sharing levels for intra and inter-agency use as well as for the general public. This will improve inter-agency coordination and cooperation, and at the same time, will increase public access to forest related information and support NGO activities such as independent forest monitoring. The forest data portal could also incorporate Geo Portals developed by CENN and planned by IUCN; as well as other products e.g. plant cover and land use maps developed by

	<p>NACRES for certain areas in Georgia, results of already completed inventories and existing historical data when appropriate. This will ensure sustainability of already undertaken efforts and will help to consolidate all existing data. In addition, the Centre has a formal responsibility to ensure public access to information related to environment and natural resources related permits and licenses. Information on forest use licenses could be incorporated into the forest data portal and also uploaded on the GFW website. It is also planned that the database will be used for electronic reporting to the Ministry, e.g. submitting applications or required documents by proponents.</p> <p>Additionally, Environmental Data Portal could incorporate other layers not directly related to forest, e.g. land degradation, natural disasters and other.</p> <p><i>Other uses of the broader environmental database</i> Some more agencies/structural units can benefit from additional layers provided by the data portal</p> <p>Service of Land Resources Protection and Mineral Resources, MENRP needs information on land degradation and land use in order to study and analyse causes of land degradation, which is also affecting forest, including climate change.</p> <p>National Environmental Agency, MENR, Departments of Hydrometeorology and Geology need data for natural hazards prognosis and prevention. This includes data on conditions of glaciers, areas with landslide risks and other. Providing that natural hazards represent one of the important concerns in Georgia, and there are insufficient resources to undertake regular field observation, satellite data could be extremely valuable.</p> <p>National Agency of Public Registry can both share and benefit from updating their data on land use, land ownership, borders of the forest fund, licensed areas and other.</p>
Assessment of possible need for higher resolution data:	Different resolution images will provide data of different detail. Possible higher resolution images will be needed for almost all activities, especially for studying species composition.
Inputs / projected costs ¹³² :	<p>...</p> <p>Nationally based data portal could be supported by the Center for Environmental Information and Education, a legal entity of public law under the Ministry of Environment and Natural Resources Protection. Development and maintenance of the database would not incur additional costs, so that this could be added to already ongoing and planned activities of the Center, such as development of a national data portal compiling all environment related data and information. In addition, the Ministry of Finances of Georgia ensures technical support to the data portal, such as maintenance of the server and other activities.</p>
Targets and indicators, including specific biodiversity, carbon and land degradation-related benefits, where appropriate ¹³³	To be added later

¹³² Typical use case demonstrations may typically range from \$50-100,000

¹³³ These will be combined and incorporated into tracking tools

Use case title:	4 Protected Area Management
Area(s) of geographic focus (if any):	Protected areas
Problems / challenges / issues that GFW may help to address ¹³⁴ :	<p>There are in total more than 80 protected areas of different categories in Georgia, which cover 7.47% of the country area.¹³⁵ Protected areas are important tool for biodiversity conservation, and additionally, they have important role in scientific research and socio economic development, especially in terms of tourism development. One of the biggest challenges related to protected areas management in Georgia is development of unified protected area network. Still, protected areas are not connected in a single network and there are sensitive areas that do not have protected status. There is no plan for spatial development of protected areas, which would support increase of protected area coverage and connectivity. In addition, land use patterns in territories adjacent to protected areas, and activities such as extraction of natural resources, unsustainable agriculture, development projects etc. cause risks of negative impacts on protected areas, such as pollution, ecosystem degradation, disturbance and other. Other challenges are management planning and illegal use of natural resources. Most of the protected areas are managed without management plans, based on temporary regulations.¹³⁶</p> <p>In addition, there are no effective mechanisms for data collection, storing and analysis, which makes difficult to reveal changes in species habitats. This makes difficult to assess actual conditions and trends of biodiversity. Lack of data is identified as major barrier for biodiversity conservation and effective management of biological resources.¹³⁷</p>
Initial conclusions from GFW re. historic baseline and trend / scenario: ¹³⁸	Data on protected areas in Georgia and their borders indicated on the GFW website is incorrect and outdated.
Current activities / efforts to address problem (including Government, civil society and donor support, as relevant), including the process into which GFW would fit: ¹³⁹	<p>There has been significant progress in development of the protected areas network. Further increase of protected areas is planned and process of establishment of several of them is ongoing. Recently adopted second Biodiversity Strategy and Action Plan 2014-2020 sets target to reach protected area coverage at least 12% of the land area and 2.5% of marine space by 2020. This will significantly increase share of protected areas in the country.</p> <p>Significant work has been undertaken in terms of developing tourist infrastructure on protected areas. Presently number of the protected areas have adequate tourist infrastructure and can provide different services, which has resulted in increasing trend of visitors. Some other related capacity building activities are in progress.¹⁴⁰</p> <p>Caucasus Nature Fund (CNF) was created in 2006, aiming at supporting the Southern Caucasus Countries by co-financing protected area expenses.</p>
Description of relevant baseline data layers:	<p>Protected areas</p> <p>Protected areas zoning – indicating level of protection and functional characteristics of protected areas</p> <p>Forest cover</p> <p>Forest change</p> <p>Intact forests</p> <p>Land use – areas covered by forest, areas not covered by forest, pastures</p> <p>Land degradation</p>

¹³⁴ Use 'initial thoughts' column in Table 2.4 as a starting point from which to build this description

¹³⁵ National Biodiversity Strategy and Action Plan 2014-2020, approved by Government Resolution N343 of 8 May 2014

¹³⁶ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012; National Biodiversity Strategy and Action Plan 2014-2020, approved by Government Resolution N343 of 8 May 2014

¹³⁷ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012

¹³⁸ For site-based cases, a GFW-generated map should be attached

¹³⁹ This should include data and information systems / process currently in place related to action.

¹⁴⁰ National Environmental Action Programme of Georgia approved by Government Ordinance N127 of 24 January 2012

Description of key stakeholders / potential partners:

Proposed GEF project activities to use GFW to address problem / challenge, including co-ordination and harmonization with baseline data and information systems and efforts:

Land ownership
<ul style="list-style-type: none"> • Agency of Protected Areas • Akhmeta Municipality Local Self-Governance • Environmental Information and Education Centre • ENPI East Countries FLEG II Program implemented by the World Bank in partnership with WWF and IUCN • Support Programme for Protected Areas in Caucasus, Georgia aims at improvement of natural resources and protected area management in the selected protected areas taking into account livelihoods of the rural population in a long-term perspective. • UNDP-GEF Project on Machakhela Protected Area in Adjara is designed to enhance management effectiveness, biogeographic coverage and connectivity of Protected Areas of Adjara Autonomous Region of Georgia in order to better conserve the globally unique Colchic Forests. • Czech development Agency has developed and will further support Draft Tusheti Protected Landscape Management Plan in the framework of the project “Preparation of Management Plan for Tusheti Protected Landscape. • Caucasus Nature Fund a German non-profit organization supports the protected areas in the South Caucasus countries by providing long-term funding for operating costs, improved management and sustainable development of the protected areas in the region. • WWF Caucasus and the Critical Ecosystem Partnership Fund (CEPF) a partnership for biodiversity conservation in the Caucasus Ecoregion focuses on the conservation of globally threatened species, priority sites and conservation corridors by providing funding and technical assistance for the scientific community and civil society groups.
<p><i>Defining protected area borders</i> Protected area borders need update and adjustment. Digitalization of old paper maps from 1990s caused inaccuracies, which need to be corrected. In addition, updates need to reflect expansion of protected areas network. At the first stage defining outer contour of protected areas with precision of at least half a meter is desirable. The next step will be mapping details – forests, pastures, rivers etc. Formal rules for defining protected area borders have been already developed. Demarcation of borders will need field works. However, satellite images could be used in preparatory stages.</p> <p><i>Forest monitoring/assessment within the protected areas</i> Management of forest in protected areas differs from management of production forest so that in the first case the priority is to maintain natural ecosystem processes as much as possible and human intervention is justified only when it contributes to natural processes. Forest monitoring in protected areas is essential to observe natural processes and plan measures accordingly.</p> <p>GFW satellite data can be used for observing forest dynamics and implementing forest-monitoring activities. This includes: identifying and mapping land use types – areas covered by forest and areas not covered by forest including pastures; observing forest change dynamics over time and identifying causes; observing border change between alpine meadows and forest caused both, naturally and by overgrazing; assessing areas degraded due to natural disasters, fires or other and observing natural regeneration over time, including species shift from coniferous to deciduous. It is also very important to observe pastures and study erosion processes.</p> <p>Updating forest cover data (percentage of forest cover in protected areas) will help to identify extent of forest degradation within the protected areas through past years and analyse its causes including climate change.</p>

Assessment of possible need for higher resolution data:	<p>Analysing long-term natural regeneration process will help to identify areas where natural regeneration does not go well and human intervention is needed. Areas with good natural ability to regenerate will be left intact, to ensure maintaining natural ecosystem processes. It could be also studied how forest fires can help to ecosystem regeneration processes so that fires in some cases speed up ecosystem development processes.</p> <p><i>Monitoring of adjacent areas</i> It is very important to observe areas adjacent to protected areas so that processes going on in these territories e.g. clear cutting, forest degradation, fires, pests etc. as well as infrastructure development and urbanization affect adjacent protected areas.</p> <p><i>Identifying potential protected areas</i> Expansion of protected areas network is planned by national strategic and policy documents including new National Forest Concept of Georgia. Satellite data could help to identify intact areas, which could be considered as potential, new protected areas.</p>
Inputs / projected costs ¹⁴¹ :	<p>...</p> <p>Nationally based data portal could be supported by the Center for Environmental Information and Education, a legal entity of public law under the Ministry of Environment and Natural Resources Protection. Development and maintenance of the database would not incur additional costs, so that this could be added to already ongoing and planned activities of the Center, such as development of a national data portal compiling all environment related data and information. In addition, the Ministry of Finances of Georgia ensures technical support to the data portal, such as maintenance of the server and other activities.</p>
Targets and indicators, including specific biodiversity, carbon and land degradation-related benefits, where appropriate ¹⁴²	To be added later

Use case title:	5 Forest Carbon Stock Analysis for UNFCCC reporting¹⁴³
Area(s) of geographic focus (if any):	Countrywide
Problems / challenges / issues that GFW may help to address ¹⁴⁴ :	National GHG inventory, which is part of the Second National Communication to UNFCCC, includes carbon removal by sinks from land use, land use change and forestry (LULUCF) sectors. The inventory of land use, land use change and the forestry sector is based on the idea that the flow of CO ₂ from and to the atmosphere is equal to changes in carbon stocks existing in biomass or soils, and that the changes in carbon stocks could be assessed on the basis of land use changes and activities, causing these changes, such as burning, clear cutting, selective cutting etc. Changes in carbon stocks were examined by assessing: changes in forest and other woody biomass stocks; forest and grassland conversion to agricultural or other types of land; carbon uptake by the abandoned managed lands; and emissions and removals from soil. In most cases, due to lack of updated data it has not been

¹⁴¹ Typical use case demonstrations may typically range from \$50-100,000

¹⁴² These will be combined and incorporated into tracking tools

¹⁴³ Source: Georgia's Second National Communication to the UNFCCC

¹⁴⁴ Use 'initial thoughts' column in Table 2.4 as a starting point from which to build this description

Initial conclusions from GFW re. historic baseline and trend / scenario:¹⁴⁵

Current activities / efforts to address problem (including Government, civil society and donor support, as relevant), including the process into which GFW would fit:¹⁴⁶

possible to make assessments for recent years.

Assessment of *changes in forest and other woody biomass stocks* is based on existing forest data and average forest increment of timber. So that detailed data on species composition does not exist, and forests are classified only as coniferous and deciduous, the total absorption of CO₂ by forests was assessed by multiplying the areas occupied by coniferous and deciduous forests, by the IPCC 1996 default values of mean annual increment of biomass, and summarising the results obtained. Still, calculations were made only for 1998-2002 years, so that for other years the data is not available. CO₂ release is calculated based on commercial extraction and traditional consumption of firewood.

There is no data on *conversion of forest and grassland to arable land* to estimate annual losses of biomass. Though it is believed that there have not been large-scale conversions of different categories of land into arable land.

Similarly, there is no data on changes in carbon stocks resulting from the *abandonment of cultivated arable land*. Still, experts believe that this change has not been significant.

CO₂ emissions and removals from soils are assessed based on changes in land use or changes in land cultivation. Changes in carbon stocks in arable land, pastures and hayfields, and mineral soils were assessed only for 1998-2002, so as there is no data for more recent period.

GFW website provides data on forest cover, annual loss and 12-year cumulative gain. However the given resolution might not be reflecting existing situation accurately. In addition, FAO data is provided on forest types, carbon stocks and GHG emissions.

First initial National Communication to UNFCCC was prepared in 1997-1999 as a first step towards implementing obligations under the Convention. Since then, number of projects has been implemented aimed at studying various aspects of climate change and preparing for mitigation and adaptation proposals.

Second National Communication to the UNFCCC was prepared during 2006-2009. In the same period, GHG inventory has been undertaken, future climate change scenarios have been developed and the vulnerability of different ecosystems and economic sectors to current and expected climate change has been assessed. In addition, the adaptation projects were prepared, along with the planning of GHG abatement measures and numbers of activities in public awareness raising have been implemented.

Based on the assessments and the SNC as well as other past and ongoing projects in Georgia, short and long-term climate change strategies have been prepared. The strategies are focused on the priority regions selected during the stocktaking exercise. The strategies aim at removing barriers in the following six areas: enhancing the local potential for the implementation of UNFCCC principles; ensuring the sustainability of the national GHG inventory; assessing the vulnerability to climate change and adaptation measures; mitigating GHG emissions and raising public awareness.

Currently, work on the Third National Communication to UNFCCC is in progress.

¹⁴⁵ For site-based cases, a GFW-generated map should be attached

¹⁴⁶ This should include data and information systems / process currently in place related to action.

Description of relevant baseline data layers:	<p>Forest change – loss and gain</p> <p>Land use – agricultural, non-agricultural, areas covered by forest, areas not covered by forest; grassland, cropland, wetlands, settlements.</p>
Description of key stakeholders / potential partners:	<ul style="list-style-type: none"> • Government of Georgia is responsible for implementing UNFCCC including leading and coordinating all activities relating to climate change. • Ministry of Environment and Natural Resources Protection • Service of Climate Change • National Environmental Agency • Forest Agency • Other stakeholder Ministries – of Energy, Economy and Sustainable Development, Agriculture, Labour Health and Social Affairs and others, as well as National Statistics Office of Georgia and other agencies are also involved and support reporting to UNFCCC. • UNDP-GEF Project on Second National Communication to UNFCCC supported preparation of the Second National Communication to the UNFCCC. Preparation of the Third National Communication is in progress currently.
Proposed GEF project activities to use GFW to address problem / challenge, including co-ordination and harmonization with baseline data and information systems and efforts:	<p>GFW can contribute to accurate, updated data on forest annual increment of timber, which is necessary to assess changes in forest and other woody biomass stocks. As mentioned above, the latest available data is dated by 1998-2002. Data used for the reporting to UNFCCC is mainly derived from the old existing statistical information, fragmented inventories carried out in different years by the national authorities, as well as data provided by license holders. Forest loss is mainly assessed on the basis of commercial extraction and traditional consumption of firewood.</p> <p>In addition, species composition, at least updated coniferous/deciduous breakdown is necessary for calculating carbon removal.</p> <p>Data on land use and land use change will be valuable to assess conversion of forest and grassland to arable land, abandonment of cultivated arable land and carbon removals from soils. Presently there is no data available to make such assessments.</p> <p>Accurate annual data on forest increment and forest loss is essential not only for reporting to UNFCCC, but for further planning, implementation and monitoring, including for Low Emission Development Strategy (LEDS).</p>
Assessment of possible need for higher resolution data:	<p>Higher resolution images are needed for generating more accurate data on forest loss and gain and species composition (at least coniferous/deciduous breakdown).</p>
Inputs / projected costs ¹⁴⁷ :	

¹⁴⁷ Typical use case demonstrations may typically range from \$50-100,000

Targets and indicators, including specific biodiversity, carbon and land degradation-related benefits, where appropriate¹⁴⁸

To be added later

Use case title:

Area(s) of geographic focus (if any):

Problems / challenges / issues that GFW may help to address¹⁴⁹:

Initial conclusions from GFW re. historic baseline and trend / scenario:¹⁵⁰

Current activities / efforts to address problem (including Government, civil society and donor support, as relevant), including the process into which GFW would fit:¹⁵¹

6 Reforestation

Could be identified priority areas e.g. in Samtskhe-Javakheti region

Unsustainable forest use, illegal cuts, overgrazing, pests and diseases and forest fires are identified as major causes of forest degradation in Georgia. The result is significant decline in forest density. Larger areas of forest have been degraded due to infrastructural projects and mining. National Forest Concept of Georgia among forest management priorities sets restoration of degraded forest and afforestation of areas not covered by forest. National Biodiversity Strategy and Action Plan of Georgia 2014-2020 suggests, as one of the strategic approaches, carrying out inventory of forest areas that have been lost, degraded or changed as a result of infrastructural projects or mining, assessment of conditions of these areas and restoration based on landscape adaptation methods.

Satellite images show increasing forest degradation in certain areas in Georgia through the period of 2001-2011. At the same time, forest degradation significantly exceeds reforestation. In addition, providing that decline of forest density, which is not easily observable on satellite images, is a significant issue in Georgia, actual degradation is expected to be greater.

National strategic and policy documents of Georgia identify reforestation and restoration of degraded areas among priority measures. In 2010 regulation on forest tending and restoration rules was adopted,¹⁵² which outlines main provisions on forest tending and forest restoration. In addition, growing forest plantations on open areas, in order to decrease pressure on forests in a long term, is one of the strategic approaches suggested by National Biodiversity Strategy and Action plan.

Activities supporting natural restoration have been carried out since mid-20th century and in total covered 230.9 thousand ha during last 50 years. From this, artificial forest was created on 72.5 ha. After 1991 forest restoration activities have been reduced dramatically. With financial support of the World Bank, reforestation activities covered 113.5 ha in 2003-2004 and 265 ha in 2006-2009; activities supporting natural

¹⁴⁸ These will be combined and incorporated into tracking tools

¹⁴⁹ Use 'initial thoughts' column in Table 2.4 as a starting point from which to build this description

¹⁵⁰ For site-based cases, a GFW-generated map should be attached

¹⁵¹ This should include data and information systems / process currently in place related to action.

¹⁵² Resolution N241 of the Government of Georgia of 13 August 2010 on forest tending and restoration rules

<p>Description of relevant baseline data layers:</p>	<p>reforestation process was implemented on 190.1 ha in 2003-2004 and 2096.4 ha in 2006-2009.¹⁵³ In Adjara activities supporting natural reforestation covered 32 ha last year and 100 ha this year. In addition, forest plantation was planted on 12 ha.</p> <p>Some other small-scale forest restoration activities have been implemented during 2008-2011 including in the framework of the BMU International Climate Initiative/KfW/WWF project “Mitigating Impacts of Climate Change through the Restoration of Forest Landscapes in the Southern Caucasus”.</p> <p>Forest cover – tree cover extent; intact forest landscapes Forest change – loss and gain Forest use – areas licensed for logging and mining Conservation – Protected Areas Land use – agricultural, non-agricultural, areas covered by forest, areas not covered by forest Land ownership Land degradation</p>
<p>Description of key stakeholders / potential partners:</p>	<ul style="list-style-type: none"> • Forest Policy Service • National Forest Agency • Service of Biodiversity Protection • Adjara Autonomous Republic Forest Agency • WWF Caucasus programme office
<p>Proposed GEF project activities to use GFW to address problem / challenge, including co-ordination and harmonization with baseline data and information systems and efforts:</p>	<p>Forest restoration, which includes supporting natural regeneration as well as planting and seeding, requires prior identification of areas subject to restoration, studying: species composition before degradation, causes of degradation, natural regeneration ability, favourable natural conditions, pressures to the area e.g. grazing, assessing negative consequences of forest degradation on the given area and other. To restoration are subject burnt areas and natural and artificial forests having degraded by other causes; as well as areas not covered by forest where climatic conditions allow afforestation; and thinned or degraded natural groves, which requires artificial restoration or reconstruction.¹⁵⁴</p> <p>Satellite observation of forest change dynamics, forest degradation and natural restoration of degraded areas over time could serve as an additional tool in preparatory activities for forest restoration such as identifying degraded landscapes subject to restoration; as well as for monitoring areas recovered both, naturally and as a result of restoration activities. Additionally, in case broader environmental database provide data on occurred fires, natural disasters and land degradation, this could contribute to analysing possible causes of forest degradation and assessment its consequences.</p> <p>Identification of degraded areas subject to restoration has been a challenge also in Adjara. While forests in Adjara are no longer subject to licensing, causes of existing degradation are past logging activities and pests.</p>
<p>Assessment of possible need for higher resolution data:</p>	<p>Higher resolution data will be needed for observing decline in forest density or species shift.</p>
<p>Inputs / projected costs¹⁵⁵:</p>	

¹⁵³ Earlier Forest Policy Document, not adopted

¹⁵⁴ Resolution N241 of the Government of Georgia of 13 August 2010 on forest tending and restoration rules

¹⁵⁵ Typical use case demonstrations may typically range from \$50-100,000

Targets and indicators, including specific biodiversity, carbon and land degradation-related benefits, where appropriate¹⁵⁶

To be added later

¹⁵⁶ These will be combined and incorporated into tracking tools

Appendix 1: Adjara pilot demonstration

Adjara Autonomous Republic is the southwestern part of Georgia located on the coast of the Black Sea with total area of 2 900 km². Forests in Adjara are diverse, represented by sub-alpine as well as mixed deciduous forests. Total forest area is 191 603,7 ha, about 65% of the whole territory, including 13 693 ha state reserves, 15 807 ha national parks and 7 084,1 ha sub-alpine forests. Areas within 1000-2000 m above sea level have the biggest forest coverage – 61%. 55,9% of the forest is located on slopes of 31 degree and more, having crucial land protection and water regulatory functions.

Adjara has been selected as a potential area for implementing project pilot case during the stakeholder consultations, including with the authorities of Adjara AR, as well as the validation workshop group discussions. Several key points, discussed below, have been identified in support to Adjara pilot case during the stakeholder consultations and discussions:

- the Adjara Government as well as the Ministry of Environment and Natural Resources Protection of Georgia strongly support implementation of the Adjara pilot case;
- there is good coordination among national, regional and local levels;
- while there is no commercial logging in Adjara, large scale social logging as well as pests and diseases have been identified as causes of forest degradation, requiring urgent measures;
- significant shift of the upper border of the forest have been observed caused by past unsustainable logging, overgrazing and climate change; there is certain amount of available forest data based on the past inventories, which can be used as a baseline for forest monitoring;
- except protected areas, there are important animal migration routes and the ecological corridor connected to inner regions of Georgia (Samtskhe-Javakheti and Guria) as well as Turkey;
- Adjara is bordered by Samtskhe-Javakheti region, where there is licensed logging, as well as illegal logging and large-scale forest fires.

The following use case areas have been identified as relevant for Adjara: forest assessment/inventory/monitoring, forest carbon stock analysis and reforestation.

1) Forest assessment/inventory/monitoring

Forest change dynamics

There is relatively good amount of available information on Adjara forests. Forest inventory was undertaken in Adjara in 2005-2006. However, due to early termination of the project, the results have never been approved formally. Demarcation of forest borders was undertaken last year. The government is planning new forest inventory in Adjara for the next year. With certain amount of already available baseline information, satellite observation can assist in regular monitoring of forest change dynamics, including observation of natural succession processes as well as forest degradation.

Forest degradation

Diseases and pests have been identified as one of the major causes of forest degradation in Adjara. Total area of the forest affected by diseases is 11 788 ha, which is 7.2% of the total forest area. Despite small scales of the infection spread, the situation is considered as dangerous since the diseases are characterized with high intensity and have several distribution focuses, where 70-80% of forest is infected.¹⁵⁷ Adjara Climate Change Strategy developed in the framework of the Third National Communication to Climate Change links increased forest diseases to the climate change and identifies as one of the project proposals establishment of the monitoring system aiming at prevention of climate change impact on spreading wreck-diseases in Adjara forests. Another proposal concerns restoration of degraded sub-alpine forests, caused by excessive logging in the past. Satellite observation can be applied as an additional tool for revealing degraded areas and observing natural regeneration, based on which further interventions can be planned.

¹⁵⁷ Regional Development Strategy of Adjara AR

Conservation

Another focus of forest monitoring can be revealing forest groves with high conservation value with the aim to plan further conservation activities, which is identified as one of the measures for biodiversity protection in the Regional Development Strategy of Adjara AR.

2) Reforestation

Despite illegal logging rate have been significantly decreased in Adjara, due to inappropriate management as well as forest diseases and pests the density of the most of the forest is reduced. Forest restoration, identified as one of the priority measures in the strategic documents, has been implemented at different extent during past years. Activities supporting natural reforestation covered 32 ha last year and 100 ha this year. In addition, forest plantation was planted on 12 ha. However, identification of degraded areas subject to restoration has been a challenge. Remote sensing tools can assist in revealing such degraded areas and in planning restoration/reforestation where needed.

3) Forest carbon stock analysis for reporting to UNFCCC

Adjara, due to its unique subtropical climate and recourses and natural conditions, relevant for development of two of the national priority sectors – tourism and agriculture, have been one of the focus areas covered by the national communications to the UN Climate Change Convention.¹⁵⁸ The third National Communication to the UNFCCC pays special attention to the study of climate change impacts on different sectors of economy and natural ecosystems in Adjara, as well as assessment of the expected changes in climate in the nearest decades. In addition, in the process of preparation of the Third Communication, the first GHG inventory was undertaken in Adjara. Four sectors have been assessed including land use, land use change and forestry (LULUCF). The assessment was based on 2005 forest inventory of Adjara. While forest data in Adjara is relatively recent, compared to other regions in Georgia, it is not complete and already needs update. Accurate, updated data on annual increment of forest in Adjara as well as land use changes is very important not only for reporting to the UNFCCC, but for planning and implementing strategy for reduction of greenhouse gases.

¹⁵⁸ UNDP, Climate Change Strategy of Adjara, 2013

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LIST OF ABBREVIATIONS

ARSIE: Association of the Networks of Environmental Information Systems
AP: Protected areas
CAZ: Ankeniheny Zahamena Corridor
UNFCCC: United Nations Framework Convention on Climate Change
CDB: Convention on Biological Diversity
CI: Conservation International
CIRAD: Center of international cooperation in agronomic research for development
CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLB: Local Grassroots Community
COAP: Code of Protected Areas
COBA: Grassroots Community
COGESFOR: Malagasy Forest Ecosystems Management and Conservation Project
COMATSA: Marojejy – Tsaratanana – Anjanaharibe Corridor
COFAV: Fandriana – Ambositra Vondrozo Corridor
DCSAPM: Department of Conservation and System of Protected Areas of Madagascar
DGEF: Directorate General of the Environment and Forests
DREF: Regional Directorate of the Environment and of the Forests
DVRF: Department of Valorization of Forest Resources
FTM: Foibe Tao-tsaritany Malagasy
GCF: Forest Contract Management
GELOSE: Secure local management
GESFORCOM: Commune and Community Forest Management
GFW: Global Forest Watch
IEFN: National Ecological and Forest Inventory
INSTAT: National Institute of Statistics
IRD: Research Institute for Development
MECIE: Making Environment-friendly Investment
MNP: Madagascar National Parks
NAP: New Protected area
ONE: National Office for the Environment
ONESF: National Observatory of the Environment and Forests
ONG: Non-Governmental Organization
PAGS: Simplified Development and Management Plans
PCD: Commune Development Plan
PE: Environmental Program
PHCF: Holistic Program for Forest Conservation
PNAE: National Program for Environmental Actions
UNDP: United Nations Development Program
UNPE: United Nations Program for the Environment
PRD: Region Development Plan
PSE: Ecosystem Services Payment
REDD: Reduction of Emissions from Deforestation and forest Degradation
R-PP: Readiness Preparation Proposal
SAPM: System of Protected areas
SGBDF: Forest Database Management Office
SGFD: Sustainable Forest Management Site
TBE: Environmental specifications
TG: Management transfer
TGRF: Forest resource management transfer
EU: European Union
UICN: International Union for the Conservation of Nature
VOI: Vondron'Olona Ifotony
WCS: Wildlife Conservation Society
WRI: World Resource Institute
WWF: World Wildlife Fund for Nature

1. Background

In 1998 Madagascar ratified the United Nations Framework Convention on Climate Change (UNFCCC), and in 2011, adopted its National Policy of Fight against climate change. The goal for the strategic axis number 2 of this policy: « Implementation of the mitigation actions for the sake of the country's development » is to establish the different national, regional and sector-based strategies to contribute to mitigating greenhouse gas emissions. Likewise, one of the goals of strategic axis 3 is to develop and popularize all necessary tools and instruments to facilitate accountability at all levels. The present GEF-GFW project which aims at reducing deforestation and plans for stakeholder participation, thus contributes to achieving the goals of the Malagasy mitigation strategy.

Considering Madagascar's current environmental situation, one can argue that the Great Island is now facing a very important environmental dilemma. On one side, we have a highly exceptional biodiversity wealth, while on other side, we witness an alarming deforestation. Because of this paradox situation of biological wealth and high threat of degradation, Madagascar is among the ten hotspots of biological diversity. The following table shows a few figures on the exceptional endemism rates in Madagascar.

Tableau n°1. : A few figures on endemism rates in Madagascar

	Number of species	Percentage of endemism
Mammals	210	98%
Avifauna	310	60%
Herpetofauna	630	98%
Freshwater fish	164	60%
Higher plants	13,700	>90%
Baobab	8	75%

As a paradox to this exceptional richness, the annual deforestation rates amount to 0.4% according to reports from ONE, DGF, FTM, MNP on the «Evolution of the natural forest cover in Madagascar 2005 - 2010». The same report concludes the facts on deforestation as follows:

- The natural forest cover in 2010 has been assessed at 9,220,040 Ha.
- Approximately 36,000 Ha of natural forests have been lost every year in Madagascar between 2005 and 2010.
- The annual deforestation rates for the 2005-2010 period are estimated at 0.4%. This represents a decrease compared to previous periods as the rates have been 0.8% between 1990 and 2000 and 0.5% from 2000 to 2005.
- The highest regional deforestation rates have been recorded in the regions of Boeny and Atsimo Andrefana, respectively with loss rates of 0.9% and 0.8% per year for that period.
- In terms of deforested surface, the regions of Atsimo Andrefana and Menabe are the most affected as they have lost respectively close to 66,000 Ha and 26,000 Ha between both dates; half of the lost surfaces are located in both regions.
- Low altitude forests located below 400 m are more affected by the deforestation than those of higher altitude, with loss rates of 0.5 % per year.
- The deforestation rates inside the Protected Areas (PA) managed by the MNP have reached 0.2% per year, i.e. half of the national rates.
- The thorny forests and the dry forests remain more threatened compared to rainy forests.
- Madagascar remains in the category of the high deforestation rate country.

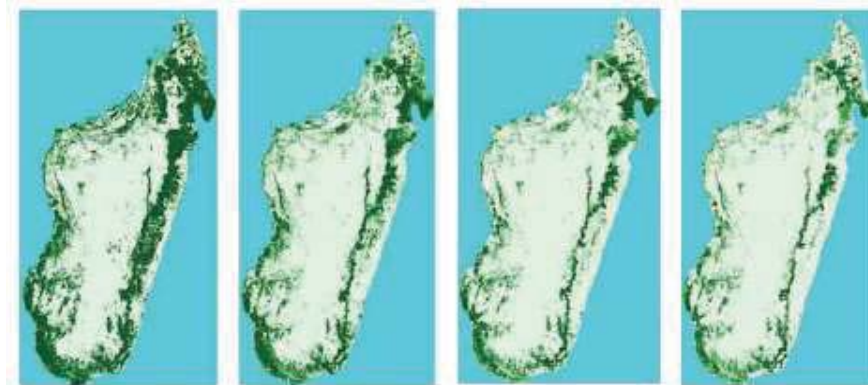


Figure 1. Evolution of forest cover in Madagascar (1950-1970-1990-2000)
(Source Conservation International)

There are several causes of deforestation, and they differ from one site to the next. Likewise, those figures are not static; they evolve along with the socio-economic status as well as the socio-political environment. Listed below are the four main causes of deforestation:

- The slash and burn farming practiced in the forest zones make up the main cause of deforestation. No forest ecosystem makes an exception to this devastating farming practice.
- Illegal mining exploitation activities also contribute to deforestation, especially to the forest degradation' biological wealth. In fact, this exploitation is carried out in a way that skims the forest massifs of the noble species. The exploitation technique used (level of cutting and logging ...) does not care about forest integrity either.
- Mining settlements close the list of the causes of deforestation. The creation of industrial mining facilities is done at the expense of natural resources (forests, water, soil); while illegal mining activities also threaten the integrity of the biodiversity in Madagascar. In fact, illicit mining is always accompanied by the destruction of forests, soils and fauna.
- Finally, failure to enforce the laws and the lax attitude notices within the forest administration contributes to maintaining the process of forest degradation in Madagascar.

Deforestation has maintained widespread poverty among the population. There was an estimated total population of 17.9 million in 2004, i.e. a density of 30 inhabitants/km². The 2001 population growth rate was 2.8 per cent. 73% of the population lives in rural areas. In order to survive, the poor population was forced to exploit the natural resources available and within their reach. 92% of the population lives with less than USD 2 a day (WB, 2013)¹⁵⁹. According to the United Nations Development Program, Madagascar is among those countries the most severely hit by malnutrition, along with Afghanistan and Haiti. Besides, the very instable political situation disturbs the development process. Madagascar has experienced periodic decade-long political crises, during which international funding is put on hold while conservation and development actions are practically frozen. Such situations only exacerbate the degradation process of forest and biodiversity in Madagascar.

Despite this rather grim situation, there are favorable factors as well as local and international initiatives to reduce the degradation of the environment in Madagascar. Early in the 90s, we felt a widespread awareness as the charter of the environment was adopted, forest legislations were reviewed, and local populations were empowered in natural resource management. The civil society, the private institutions and the Non-Governmental Organizations were rushing to protect the environment. However, the conservation actions and natural resource management are stalling because of the inexistent or insufficient communication of any information and data on the resources.

In fact, the availability of information is the missing link in natural resource management in Madagascar. All the more since if such information do exist, they are more often scattered and outdated. The technology used for data collection is not compatible to ensure credible, regular information that are updated in real time. Consequently, the use of such information is very limited and remains descriptive.

¹⁵⁹ http://hdr.undp.org/sites/default/files/hdr_2013_summary_fr_0.pdf

Yet, an adequate natural resource management requires permanent up-to-date information likely to help towards rapid decision-making and appropriate planning.

2. Analysis of the situation of the forest information systems

2.1. Forest monitoring systems and information flow

The following paragraphs provide a quick overview of the backgrounds of deforestation and the aspects ruling over the forest monitoring system and information flow.

2.1.1. The policy, legislation and institutional aspects

For a long time, Madagascar has a set of measures geared towards a better management of its forest resources and limiting their degradation. Aware of the issues of increased degradation of the environment and the loss of biodiversity related to the economic situation and poverty, the Government of Madagascar has drafted its National Plan for Environmental Action (PNAE) in 1989, with the support of the World Bank, international agencies and non-governmental organizations. Then in 1990, the adoption of the charter of the environment (law No. 90-033 of December 21, 1990, on the Charter of the environment) makes up the general framework for executing the National Environment Policy and has the goals and the strategy to be implementer for the three five-year Environmental Programs.

Indeed, as financial and human resources became very scarce towards the end of the 1975 – 1991 socialist revolution, it became obvious that the forest administration was ineffective in controlling and coordinating the country's forest heritage. At the same time, the early 90s saw more awareness of policy makers on the need to include local people in the resource management process. From an economic point of view, economic liberalization - by the divestiture from the productive sector - and decentralization have led to a change in the structure and management methods in forestry. Thus, the Malagasy Government has launched a review of the forestry legislation pursuant to the Law No. 97-017 of August 8, 1997, on the review of the forest legislation. Then, a new forest policy was adopted in October 1997 by the Decree No. 97-1200 of October 2, 1997, on the adoption of the Malagasy forest policy. Since then, various measures related to forest management have been taken to strengthen the process that was started:

- The law No. 96 025 establishing local management of renewable resources
- The decree No. 98-782 regulating logging
- The decree No. 99-954 of December 15, 1999, on the compliance of investment with the environment
- The decree No. 99-954 of December 15, 1999, as amended by the decree No. 2004-167 of February 3, 2004, on the implementation of Compliance of investment with the environment (MECIE)
- The decree No. 2001-122 of February 14, 2001, laying down the requirements for implementing the contractual management of state forests.
- The Code of Protected Areas (COAP) according to the law No. 2001-05 of February 11, 2003, on the Code of protected area management
- The decree No. 2002-793 establishing incentive measures to prevent and eradicate bushfires

Furthermore, for a more effective conservation and in order to express its absolute will to conserve the unique biodiversity, Madagascar signed several international conventions:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora or CITES: 1975
- RIO Convention on sustainable development: 1995
- Convention on Biological Diversity (CDB): 1995
- Convention on Climate Change (CCNUCC): 1998
- Convention to Combat Desertification: 1997
- ...

In terms of policy, legislation and institutional Madagascar emerged from a period of lethargy characterized by loosening of natural resources management. The Government now has legislative and institutional assets to develop a coherent management of its natural resources.

2.1.2. Stakeholder analysis

The ecological role of the forest gives it a multi-sector nature. Indeed, the forest plays an important role in the availability of resources that are essential for the biological functions of living beings (water - minerals - air). Thus, it is obvious that less forest means more threats to all aspects of human existence: social, economic and cultural. Deforestation then becomes the prerogative of the entire society. The non-exhaustive list below indicates the potential stakeholders to address this challenge:

- The Government, represented by the various ministries and related agencies that contribute to improving natural resource governance (Ministry of the Ecology of the Environment and Forestry, Ministry of Water, Ministry of Agriculture) and planning (Ministry of landscape development) through more effective enforcement of the law in their respective sectors;
 - The *Office Nationale de l'Environnement* is an organization that plays an important role in disseminating information on the environment at the national level. In fact, ONE publishes and updates the regional and national environmental terms and specifications. These latter indicate the condition, pressures and conservation measures for the environment in Madagascar. The ONE's latest contribution to dissemination of environmental information pertains to the designing of the deforestation map in Madagascar from 2005 to 2010, while the map for 2010 – 2014 is being designed.
 - The SGBDF or Forest Database Management Office within the Office of the Director General of Forest. This office collects the information from the Regional Offices of the Environment and Forest. This information is presented as report of activities on several topics (reforestation completed, bushfires, logging...)
 - Domestic and international NGOs working in environmental conservation and development will collaborate in the collection, processing and dissemination of information at their level and thus help fuel the national database.
- *National Observatory of the Environment and the Forest sector*: the ONESF is an autonomous and independent body for information collection and analysis. The ONESF is a body that monitors good governance of environmental programs and actions as well as forest activities by the public or private sectors. The ONESF's attributions to collect, analyze, disseminate and monitor the evolution of environmental and forest information and data. The ONESF provides provisional-type recommendations that are used as elements of direction or correction for any decision affecting the environment and the forest sector or any related operations. The ONESF can provide support in the control and monitoring missions in the field of environmental and forest activities;
 - The FTM is an agency of the State Ministry for Infrastructure, Equipment and Territory Planning. It is the key player in mapping at the national level. The institution has a department focusing on Geographic Information System (GIS), using material with high standards of perfection and a number of human resources in the field of image processing and GIS.
 - *Association of Networks of Environmental Information Systems*: The ARSIE is a non-profit organization established in May 1999. It is a structure of facilitation and consultation for organizations and resource persons having or using information related to the environment. The ARSIE's mission is to facilitate and stimulate the flow of reliable information and data about the environment in Madagascar.

The ARSIE's activities include:

- Producing and disseminating metadata on members;
- Diagnosing, typing in a standard format, consolidating and cataloguing existing metadata within institutions;
- Training for members on using the WinIsis software.
- Implementing the conceptual model of information exchange between ARSIE and the regions (2 pilot sites in the Menabe and Alaotra-Mangoro Regions).

- Writing and editing a quarterly newsletter: FEHY
- Holding exhibitions accompanied by panel discussions.

- Local grassroots communities managing natural resource (especially COBA managing forest resources) in their local community and other organizations relying on forest resource use.
- International public and private investors and donors can more effectively target their impacts thanks to an increased ability to track and analyze the results and trends.
- Scientific communities using globally consistent data to foster a better understanding of the causes of deforestation and degradation, come up with more accurate and timely global models, addressed to policymakers.
- Civil society and the media contribute to policy debates and fight against corruption. They are effective advocates for forests and are the ones who can mobilize public opinion on the action against deforestation.

2.1.3. Sharing of forest information (flow), degree of use

Since forest information is scarce, they cannot be made available in an adequate and transparent fashion to users (government, communities, private institutions and NGO, the greater public...). As of now, each Ministry has a website that gives an overview of the Ministry, its missions, activities and achievements. Each Ministry also has documentation centers providing printed documents and often analogic maps.

There are no magazines or periodicals specialized in communicating forest information regularly. The only institution authorized to carry out this activity is the National Institute of Statistics (INSTAT) and the FTM (Foibe Tao-tsaritany Malagasy) but they do not have accurate and timely data on deforestation and forests in general. On the contrary, data on forest products exist although they are not complete and are of little use.

Nevertheless, some governmental and Non-Governmental institutions suggest investing in the dissemination of information on natural resources. The following stand out from the rest:

- The National Office for the Environment (ONE)
- The National Observatory of the Environment and the Forest Sector (ONESF)
- The Association of Environmental Information Networks (ARSIE)
- The Foibe Tao-tsari-tany malagasy (FTM)

Besides, those institutions operating in natural resource management have essential information but remain located in their intervention zone and are not always available for the greater public and users. The data are published in the reports of activities or posted on these institutions' websites. Among these institutions, there are projects in the context of bilateral cooperation as well as international NGOs (CI-WCS-WWF...)

2.1.4. General evaluation of information availability, quality, and accessibility

An effective and sustainable forest resources management depends in the timely availability of the data and information related to deforestation. A rapid analysis of the situation in the field of forest information reveals the existence of flaws and the listing below qualifies the characteristics of forest information in Madagascar:

- Non availability. The availability of information is not regular; it depends on the existence of funding and/or programs of activities of those organizations interested in such information. There is no national structure that is well equipped to ensure the effective availability of forest information. Although the Forest Administration is the first body in charge of forest information, it does not have the necessary means to do so effectively;
- The existing data presently go back a few years: IEFN (1996 – 2006), CI (2009), ONE (2010)¹⁶⁰. Thus, deforestation rates are estimated by a deductive method, based on data from these landmark

¹⁶⁰ www.pnae.mg

- years. Efforts are now underway within the ONE to assess the deforestation occurring during the 2010-2014 period with improved means;
- The search for alternative to deforestation or the fight against deforestation requires diversified data and information from different sources (forest cover, land use, demography, infrastructures...). In the present case, such data are scattered among various institutions, while a cross-cutting and integrated procedure of fight against deforestation requires centralized data and information;
 - An analysis of the availability of data and forest information in Madagascar reveals a regional imbalance. In fact, the eastern slope, home to evergreen rainforests, has an edge over the western one, home to dry forests deciduous.

The following table summarizes the information available in Madagascar in the field of forestry.

Tableau n°2.

Table: Environmental information available in Madagascar

USE CASE	EXISTING INFORMATION	TYPE	FORMAT	OWNERS
Protected areas and NAP	Baseline mapping data	BD 100 (curve - administrative boundaries - hydrography ...)	Vector map	FTM
	Total surface of forest cover	Deforestation 2000-2005-2010-2013	Digital map (Image raster)	CI – ONE
		Deforestation 2000-2005	Digital map (Image raster)	CI
		Ecosystems and land use (IEFN-1996)	Digital map (shapefiles)	DGEF/DVRF/ONE
	Location and boundary of the PA	Map	Digital map (shapefiles)	DGEF/DCSAPM
	Incidence of fire	Fire warning CI	Incidence of fire	DGEF/DVRNF
	Forest clearing	Location	Quantified data	DGEF/DVRNF
	Biodiversity	Occurrence of species	Local map	WCS
		Loss of forest (habitats)	Surface	WCS
		Distribution of species	Local map	WCS
		Natural habitats (IEFN - 1996)	National map	DGEF/DVRF/ONE
		Surfaces of the main ecosystems	National map	DGEF/DVRNF ONE
Community management	Baseline data of the TG	Location/Surface/Managing community	Map	DGEF/DVRNF
	Zoning	Zoning by type of use (Protection, right of use...)	Map	DGEF/DVRNF
	Management tools	Management contracts/PAGS	Document	DGEF/DVRNF
	Supervision, monitoring and control	Promoters	Technical document, management	DREF - CI-WCS-WWF-GIZ-CIRAD...
			Monitoring form	DREF - CI-WCS-WWF-GIZ-CIRAD...
REDD	Reference data	Surfaces of projects	Document	DGEF – ETC - WWFTERRA – WCS - CI
	Carbon stock	In terms of volume	Quantified data	DGEF – ETC - WWFTERRA – WCS - CI
	Inventory carbon source – biomass volume,	Aerial biomass	Volume	ETC TERRA – WCS – CI - WWF
Mangroves	Baseline data	Location/Boundary/Surface	Map	WWF - ONE
		Biology	Quantified document	WWF-ESSA Forest -
		Carbon production		ESSA Forest-LRI
	National Communication		Quantified document	MEEF/DGE
Mines	Mining plots	Surface/owner	Geographic coordinates-Map of region	Ministry of Mining - BCMM

USE CASE	EXISTING INFORMATION	TYPE	FORMAT	OWNERS
	National Communication (Industrial Sector)	Inventory of the GES	Quantified document	MEEF/DGE
EIE	Environmental Impact Assessment	EIE results and Reference status	Document	ONE and Projects (CI-CIRAD...)
Catchment area and water resources	Baseline mapping data	BD 500 - BD 200 at the national level - (curve - administrative boundaries - hydrography - roads ...)	"Vector" map	FTM
		IEFN	GIS "digital" map	DGEF/DVRF
	Pluivio	Daily rainfall		Directorate General of Meteorology
		Monthly rainfall		Directorate General of Meteorology
		Satellite estimate of rainfall	Daily (height/intensity, temperature)	Directorate General of Meteorology
	Hydrology	Hydrography/Hydrology	National map	Directorate General of Meteorology
			Environmental specifications	ONE
		Hydrography/Regime/Debit	Large and small rivers of Madagascar	Directorate General of Meteorology
		Global database on water	Surface catchment area, volume of water available	FAO
		National hydro database	Databank	Directorate General of Meteorology
	Land use	Map (shapefiles)	Ecosystem and land use	DGEF/DVRF/ONE
	Soils	Global databank FAO – Boundary of great categories of soils	Digital map (FAO classification)	FOFIFA/IRD
		Physical potentials of soils	Analogue map	IRD
Forest production	Aquatic resources	Fish farming production	Quantified data	Ministry of Fishing Resources and Fisheries
	Total surface/potential	Boundary of KoloAla sites	Digital map (shapefiles)	DGEF/DVRF/DPPSE/SGBDF
	Forest operators	Map of boundary	Geographic coordinates	DGEF/DVRF/DPPSE/SGBDF
		Location, name of operator, surface, volume of wood	Administrative document	DGEF/DVRF/DPPSE/SGBDF
	Type of exploitation	Adjudication/Management contract		DGEF/DVRF/DPPSE
	Reforestation	Surface/species/location	Document/report of activity	DGEF/DVRF/DPPSE/SGBDF
Landscape	Volume of wood	Volume of wood exploited/type of cover	Underway	DGEF/WAVES Project
	Landscape planning	National Plan of Landscape Development	Quantified data -maps	MECIEAT

USE CASE	EXISTING INFORMATION	TYPE	FORMAT	OWNERS
Development		Regional Development Plan	Quantified data -maps	MECIEAT/Regions
		Regional Schema of AGT Landscape	Quantified data -maps	MECIEAT/Region

2.2. Guidelines of activities to improve forest data and information systems

An analysis of the existing information above reveals important flaws in the field of forest resource monitoring and evaluation in Madagascar. The reference data useful for this monitoring is there but needs an update. If we want this monitoring to be transparent and realistic, we also need updated and regular data in almost real time. GFW can intervene effectively in this field of monitoring by providing data in almost real time and in rapid fashion on the evolution of forest covers. For more effectiveness and in view of the participation of the bodies affected by deforestation, the new GEF – GFW Madagascar project should be integrated into the national conservation strategies.

Standing out from among these strategies are the empowerment of local communities for natural resource management, the reorganization and extension of protected areas, the implementation of REDD+ Project, etc. However, it is not enough to develop synergies involving all stakeholders in the field of information to give shape to and implement the programs expressed at the level of the guideline of the National Environmental Policy. Considering the means available and the performance of the advanced technology that it has, the GEF – GFW project turns out to be of great help and offers the systems likely to address the challenge.

2.2.1. Participation of local communities in managing the RNR

In the legal context, the GELOSE law recommends compliance with the principle of integration of the grassroots community. The goal is to allow for the effective participation of rural populations (grassroots communities or COBA) in the sustainable management of renewable natural resources within the boundary of their landscape. The targeted natural resources are those within state properties (public or private national land) or Territorial bodies, and including water or terrestrial wildlife, the water and range.

Since GEF – GFW project is a project aimed at looking for solutions or alternative to deforestation, COBAs have a predominant place in analyzing the causes of deforestation and implementing the alternative. In fact, COBAs make up an important link in the acquisition of field information. The project could greatly benefit from their contribution by monitoring the process for collecting information and forwarding these data. Besides, as to the implementation of the simplified landscape management plans, COBAs have the obligation to participate in forest surveillance in general, and in monitoring deforestation, particularly.

In this context, GFW can contribute by:

- mapping the forest plots under GELOSE contract and the zoning by the PAGS;
- monitoring deforestation and illegal logging in the Management Transfers;
- providing information for forest surveillance to COBAs.

2.2.2. Protected areas

During the World Parks Congress in Durban, on September 17, 2003, Madagascar has decided to increase the surface of protected areas from 1.7 million to 6 million hectares in the next five years, and in reference to the categories of UICN's protected areas. This ambition brought about the creation of the SAPM Committee, which takes up the responsibility of supporting the creation of New Protected Areas (NAP) with the Ministry of the Environment, Ecology and Forests. The « fundamental conservation goals » in the Madagascar's protected areas are to:

- Ensure the representativity of Madagascar's unique biodiversity,
- Contribute to the conservation of the Malagasy cultural heritage,
- Maintain ecologic services and promote the sustainable use of natural resources to contribute to poverty reduction». (art. 1 of decree 2005-248).

The appendix of the Code of Protected Areas (COAP) adopts as strategic principle the fact that « **the management decisions for the development of biodiversity rely on the best knowledge available and on a wide range of researches as well as a commitment to ensure an integrated scientific surveillance.** »

In the absence of information describing the descriptive reference status of the milieu, there can be no accurate measure of the positive or negative discrepancies coming from the management. In terms of lessons drawn from the results and dictating the measures to be taken, the measurable facts pertaining to the valorization of the assets from the research can only be forwarded to the larger public and users through the data from direct observations or from the statements by role players, which are turned into information. Based on this principle, great importance is granted to information in the forest resource management.

The collection of information carried out at the national level reveals the existence of flaws to which the GFW can contribute:

- Forest surveillance inside and around parks and reserves.
- Fire warning in almost real time or other pressures (illegal logging)
- Control of overlapping with other sectors (e.g. mines)

2.2.3. *The KoloAla sites*

Experiences have shown that the protection measures are not enough for a sustainable management of forest resources. Considering the growing needs of the population in COS (timber and lumber), which reach 4 million m³ per year nationwide) (Jariala and al, 2007), forests with productive potentials experience high deforestation rates every year (2.5% versus 0.4 to 0.5% in protected areas or priority conservation zones) (MEFT, USAID & CI, 2009). Hence the need to devise a more realistic and more pragmatic management strategy adapted to the local, regional and national socio-economic context at the level of the forest massifs with production potentials. Hence the adoption of the KoloAla concept.

The main goal of the « KoloAla » concept is to contribute to the conservation of forest resources by establishing a rational and sustainable forest management system, helping to guarantee sustained production in ligneous and non-ligneous forest products, and to improve the participation of the forest sector to rural development. This initiative is understood as an integral part of the conservation efforts for forest resources and complements the activities of protection and restoration of forest ecosystems. In addition, it stresses particularly on improved participation of the forest sector to rural development by a professional, effective and sustainable use of ligneous and non-ligneous forest resources.

The overall goal of setting in place the KoloAla sites at the national level is to take part in conserving forest resources at the national level, by creating legally well-defined zones that will be used to add economic value to forests in a rational way, while maintaining or increasing the ecosystem's ability to produce forest goods (ligneous and non-ligneous forest products) and services (water regulation, protection, biodiversity conservation). Consequently, the main goal of the KoloAla sites would be the sustainable and rational production of ligneous products to meet the needs at the local, regional, national and international levels. But they can also include other zones for other forest products as well as protection zones in which some logging might be forbidden, so as to limit impacts on biodiversity.

The specific goals of the KoloAla sites are to:

- Establish viable economic management sites for a long term exploitation of ligneous forest products in natural forests outside Madagascar's current and potential protected areas;
- Maximize the financial values of specific forest blocks through the exploitation of the PFL and the PFNL while maintaining the ecosystem's critical services such as the protection of the catchment areas and biodiversity conservation;
- Facilitate the creation of sustainable forest development plans by creating well-defined large forest zones and reserved for activities of long term forest production;
- Define a clear and standardized approach for determining and managing the KoloAla sites through regional zoning workshops so as to in order to meet as a priority the need for wood supply at the regional and national levels;
- Provide clear guidance and guidelines on the processing of biodiversity and the ecologic services for the sustainable forest activities in Madagascar.

Tableau n°3.

Spatial distribution of the surfaces of Protected areas and KoloAla sites

Zones	Surface (ha)
AP managed by MNP	2 126 893.1
Extension of PA MNP	511 118.5
New Protected area	4 326 543.0
Priority PA Sites	1 038 599.6
Important KoloAla Sites	1 199 063.6
Potential KoloAla Sites	1 171 239.6

Just like for protected areas, GFW can invest in:

- the spatial location of the effective exploitation zones.
- the surveillance of the KoloAla sites in the field of fire, illegal logging and sector overlapping (mines...)
- the surveillance of the real application of the specifications

2.2.4. The REDD Project

The REDD+ Project is an essential element of the national conservation strategies. Madagascar has started to develop the REDD Project since 2001. Now, there are four REDD+ Project, including:

- Makira REDD Project: under the supervision of WCS, the project started in 2003 and covers 360,000 Ha. This project is considered to reduce greenhouse gas emissions by 38 million tons.
- CAZ REDD Project: started in 2007 and managed by the NGO Conservation International, the project covers 325,000 Ha in the Ankeniheny Zahamena forest corridor. It projects to reduce greenhouse gas emissions by 15,750,840 tons.
- Both REDD projects of PHCF (phase 2): funded by Air France, the first phase of the project took place in 2008-2012 and affected 5 sites. The second phase started in 2013 and the number of sites has been cut down to two in the rainforest of the East, the Marojejy Anjanaharibe Tsaratanana corridor (COMATSA) in the North and Beampingarata in Anosy, in the South. Both fields cover 300,000 Ha.

Test sales of carbon on the voluntary market have been initiated since 2006, showing the country's dynamism and willingness to prepare for the REDD mechanism. The preparation of the R-PP has started in 2008, led by the REDD Madagascar Technical Committee. Four strategic options have been studied in-depth in preparation for the R-PP:

- Improve the forest sector governance;
- Create incentives to sustainable management and effective use of forest resources;
- Strengthen forest monitoring and control and the enforcement of the law;
- Develop of alternatives to deforestation and the degradation of forest resources.

In its implementation phase, the REDD Project will need information to which GFW can contribute:

- Reference data on the boundaries, the quantity and production of biomass.
- Surveillance and control of the REDD project forests.
- Assessment of carbon sequestration
- ...

2.3. Challenge/hurdle on the efforts to improve forest data and information systems

Still starting from the principle of the importance of information on the effectiveness of decision-making and on a good planning of natural resource management, findings have shown that altogether, Madagascar does not have access to credible, independent, and regularly updated information on its forests. Indeed, some efforts have been made, but they are still scattered and very dependent on role players' location. Likewise, the timely availability of information is not always guaranteed. After analyzing the situation, one can argue the factors preventing from establishing constant information flow:

- Lack of the means for the administration in the fulfilling its mission of information collection and dissemination;
- High cost the material means for the regular acquisition of high quality information;

- Technical complexity of the exploitation of available data (satellite image);
- Scattered information;
- Inaccurate and incoherent information.

Decision-making necessarily requires data from different sources, but these latter are scattered among the different sectors. The information related to logging permit, agricultural investment, infrastructures and demography, which must be analyzed with the variations of forest cover, are generally monopolized within several distinct institutions in different formats, preventing any integrated analysis.

2.4. Evaluation of the potential of use/applicability of GFW

The proposed Global Forest Watch project aims at addressing all the obstacles above, by relying on the existing resources, and by developing innovative, technically very advanced but user-friendly tools. In addition, the project will actively involve with strategic user groups, including governmental organizations, companies and local NGOs to make sure the information is used effectively. Thus, the GEF – GFW project will deploy its capacities and intervention in synergy with the different national conservation and development strategies.

- *Greater ability for rapid response:* GFW will allow the enforcement of the laws and PA management to achieve an almost immediate response to fight illegal activities of deforestation, even in faraway areas. This will considerably reduce the impacts of illegal activities which can often go unnoticed for long periods because of the lack of means for the patrols and the non-enforcement of the law in the field;
- *Less implementation cost:* officers in the field will be able to focus their interventions geographically, using the warning data in almost real time. This will help reduce high costs in the field and painful activities for patrols;
- *More effective advocacy:* GFW will have a system that is accessible to the public, user-friendly and transparent. Local bodies, the private sector and the government will be able to use GFW to support the advocacy based on technology and community mobilization to support the interventions of forest conservation;
- *Enhanced empowerment:* GFW is designed to provide transparent and credible information. This will be the basis for (a) timely surveillance of the public and private sector's performance in forest management, (b) defining and measuring the baseline parameters on the change of forest cover and the payment for ecosystem services (PSE), (c) improved measuring of the evolution of the effectiveness of PA management and (d) rapidly evaluating the impact of the management measures in the forest zones and the protected areas.

GFW will contribute directly to the development, implementation and monitoring of the Voluntary Partnership Agreements (VPAs) in the context of the EU's FLEGT Action plan (application of forest regulations, governance and commercial exchanges), by improved effectiveness of law enforcement, as well as by providing essential support in the field of negotiation.

The information and data available from Global Forest Watch relate to forest cover losses and gains, presence of fires, conservation zones, and intact forests. National or local inputs can certainly enrich such data. An in-depth analysis of the GFW data might create accurate evaluations as to how a loss of forest cover took place at a given location, the speed at which the phenomenon occurred before, during and after the project. Using these data can contribute to improving the forest management and the planning for landscape development.



Figure 1. Screenshot of the GFW's website

GFW can provide information and references likely to be useful for forest management:

- In the field of community management, the overlapping of the maps of the forests transferred to local communities throughout the island with data on forest cover losses is likely to reveal important deforestation in these community-managed forest zones.
- Particularly for the REDD+, the system can intervene to help the MRV aspects (Measure, Report and Verification) of the REDD + activities, by providing a tool for monitoring and managing the forest cover in a rapid, reliable and user-friendly manner for information analysis. This might simplify the visualization, analysis and communication of the data on forest cover by cutting on costs and time necessary to produce the maps and reports. GFW will also facilitate the transparent verification of the information provided by parties on the changes of forest cover.
- As to mining activities, data from Global Forest Watch show the forest cover losses within the premises of the mining facilities of Ambatovy (Sherritt) and Fort-Dauphin (QMM) in activity as well as the adjacent infrastructures. Global Forest Watch can intervene in regional planning by highlighting any overlapping layers (Mines vs. PA, Logging vs. PA...)
- With the availability of high resolution and high frequency images (1 month), GFW helps on one hand in completing the Environmental Impact Assessment and, on the other hand, for monitoring the implementation of the Environmental Management Plans at large or small scale.
- Management of protected areas and production sites: in fact, the information from GFW shows the losses of forests and the fires occurring in the areas covered by the forest spaces, including Madagascar's KoloAla sites.

3. Main considerations

3.1. Analysis of the Use case

The concept of use cases is introduced in this process of preparing the GFW project document for a better collection of information among potential partner institutions, so as to deduct the possibilities of intervention for the said project. Therefore, the Use case is a sector of activities underway that affect the natural resource management, which GFW can contribute to improve planning and impacts.

3.1.1. Use case 1: Protected area management

3.1.1.1. Geographic fields

The System of Protected areas of Madagascar (SAPM) gather in general the protected areas in the island, classified by their categories, their periods of creation and their management modes. They are namely:

- The protected areas managed by « Madagascar National Parks » (e.g. ANGAP)
- The Extension of the protected areas managed by « Madagascar National Parks » (e.g. ANGAP)
- The Protected areas with a Temporary Status
- New Protected Areas
- Les Important Conservation Sites (priority sites to be declared as Protected areas)
- Potential Conservation Sites (sites with strong likelihood to become Protected areas)

3.1.1.2. Issues-stakes - challenges that GWF can contribute to solve

The terrestrial protected areas of Madagascar cover over 5.5 million hectares, i.e. approximately 9.4% of the country's surface. They are managed by governmental or non-governmental non-profit organizations. Despite the status of protected area regulating these areas, the forest cover in them is constantly shrinking because of the subsistence agricultural activities by neighboring communities, such as the collection of fuel wood or wood to produce charcoal, illegal collection of forest products and sub-products. The deforestation rates in the protected areas is 0.2% per year for the 2005 – 2010 period, as reported by ONE, DGF, FTM, MNP on the «Evolution of the cover of natural forest in Madagascar between 2005-2010». This rate remains high even if it stays lower than the 0.4% yearly national average.

The threats are exacerbated by the existence of a lax attitude to the detriment of the aggregated effect of the lack of good governance within the administration, and the failure of the forest control to enforce the legislation in effect. Let us point out a sizeable portion of the precious wood present on the market mainly comes from protected areas. Besides, palisander and other noble wood are now hard to find on the domestic market because of illegal logging. Despite of numerous interventions of surveillance and the administrative measures of coercion, illegal logging is constantly on the rise. Therefore, it is obvious that protected area managers as well as the forest administration need more context-based information and technical assistance to improve the way these areas are managed.

3.1.1.3. The activities underway and efforts deployed integrating the process in which the GEF – GFW project can intervene

In 2003, during the World Parks Congress, Madagascar has committed in the context of the Durban Goal to triple the size of protected areas from 1.7 to 6 million hectares. This goal has now been achieved. This illustrates the efforts deployed to enhance the effects of the conservation of forest and biodiversity in Madagascar. The management of these areas is highly decentralized, by relying on governmental, non-profit, private and/or community organizations. Yet, pursuant to the political crisis since 2009, protected area management has suffered and donors' funding has been drastically reduced, leading to increased perturbations and degradation of Madagascar's forest.

The ANGAP (National Association for Protected Area Management), now MNP (Madagascar National Parks) has been entrusted with managing protected areas. This private association has been recognized as useful for the public through the decree No. 91-592 of December 4, 1991. It is in charge of the conservation and sustainable and rational management of Madagascar's national network of national parks and reserves. Now, MNP manages 52 protected areas covering all of the Madagascar's ecoregions over a total surface of 2,858,458 ha.

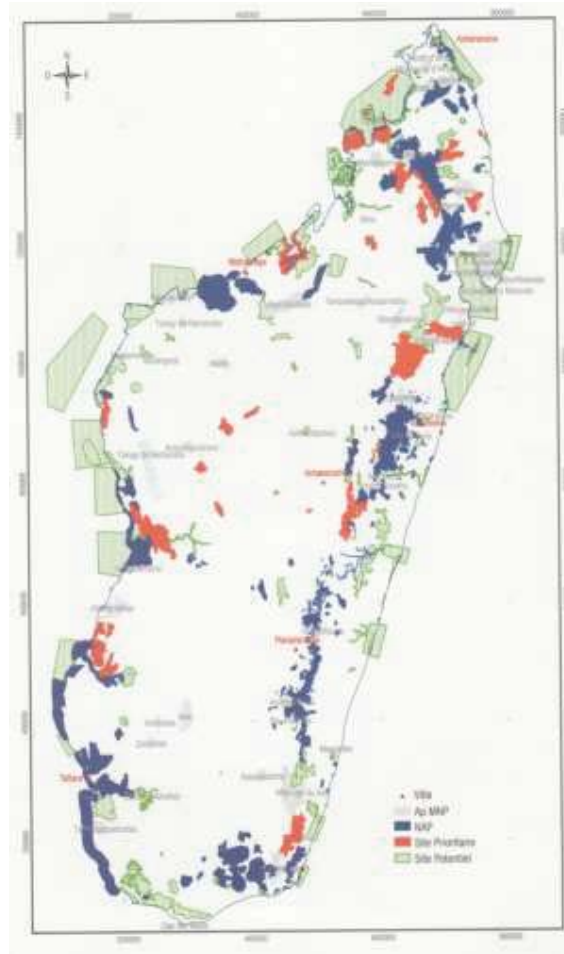


Figure 2. Map of the Protected areas (DCSAPM)

Now, the system of the protected areas in Madagascar is distributed as follows:

Tableau n°4. Surface of the protected areas in Madagascar

Protected areas	Surface (ha)
Surface of protected areas managed by MNP	2,858,458
Surface of new protected areas outside MNP	4,087,955
Total surface of protected areas of the SAPM	6,946,412

In 2014, after the organization and completion of the democratic presidential election, donors' funding for Madagascar has resumed, including the restoration of the ties with the World Bank. The elected president has taken leadership over the country and has pledged accountable forest management, including the fight against illegal trade in woods. As an illustration, now, within the MNP, the project to « *Support neighboring communities around protected areas managed by Madagascar National Parks, in terms of organization forest management and income-generation* » is well underway. This project contributes to the economic motivation of communities for conservation.

3.1.1.4. Description of the relevant layers of reference data

Tableau n°5. Availability of information and gaps for protected area management

Data layers	Information available	Information not available
Map of the protected areas.	- Boundaries of the PA (digital)	

Map of the protected areas according to their categories	<ul style="list-style-type: none"> - Categories - Managers - Surfaces - Boundaries of the PA (digital) - Reference status 	Status of protection inside and around
Protected areas outside the PA network managed by MNP	<ul style="list-style-type: none"> - Boundaries (digital) NAP - Managers - Surfaces - Reference status 	Current status versus reference level
Map of forest cover	Map of the cover 2010: ONE – DGF – FTM - MNP	Map of the forest cover 2014
Change of forests	Map of the cover 2010: ONE – DGF – FTM - MNP	Map of the forest cover 2014
Intact forests	Global level	National level
Map of land use	IEFN 2000	Update of the land use
Biodiversity	REBIOMA: Occurrence and distribution of the species	Occurrence and distribution of the species at the national level
Rights on resources	Local level: Simplified development and management plans of grassroots communities	Compilation at the national level
Real estate rights (SFR)	Local level: Simplified development and management plans of grassroots communities	Compilation at the national level
Boundaries of the carbon credit projects	Boundaries (digital)	Current status of protection Evaluation of carbon rates Biomass

3.1.1.5. Proposed activities of the Global Forest Watch project

GFW provides at the global level¹⁶¹ some data and information on different layers such as forest loss and gain... such baseline global data can be used for first degree analyses. For a finer analysis and for the sake of a transparent and credible planning, inputs of the national or local data are necessary.

❑ Update of the information on protected areas (existing data)

Support the MNP and the DCSAPM in updating the information on protected to include all information on their categories, status, and their functions. In addition, we need to adjust the changes of borders and land use. Within the REBIOMA project, there are already digital data on the boundaries of the PA managed by MNP and the NAP. Likewise, some data on biodiversity exist in the form of occurrence of species of fauna and flora as well as a distribution model of species.

❑ Monitoring - evaluation of forests in the protected areas

GFW is an agency for implementing the UNPE funded by GEF and approved by FEM. This project comes in the form of a platform of online data gathering several partners (WRI, Google, University of Maryland, ESRI ...) and providing the spatial information available in real time through baseline data layers on the whole world, country by country and zone by zone. These layers of baseline information have been drafted by a group of researchers from available and interactive algorithms. Technically, GFW

¹⁶¹ www.globalforestwatch.org

is a data management system accessible to anyone. Handling it helps maintain the baseline information for technicians and simplified information for decision-makers. The connection with the GFW system offers a wide range of possibilities, even on Smartphones.

All a country needs is a simple agreement to join the system, but enriching and giving accuracy to the data require this latter's contribution according to the topic and/or Use case on which further information is desired. In other words, GFW is a good base but it will be necessary to strengthen it.

The priority of protected area management is to maintain the natural ecologic functions as best possible. Forest surveillance in the protected areas is essential for observing the natural process or that of anthropic origin, also for planning the measures to be enforced consequently. Updating the data on forest cover (percentage of forest cover in protected areas) will help determine the scope of forest degradation in protected areas over the last years and analyze its causes. The satellite data from GFW can be used to observe the dynamic of forests and implement the activities of forest surveillance.

Inserting data on a given country might enrich what's already on GFW, or provide the necessary additional data that does not exist in GFW and is yet to be collected; but in any case, the idea is to have more added values on handling the tool. The information useful for monitoring deforestation mainly deals with:

- Forest loss and gain
- Incidences of fires
- Identification and mapping of the types of land use - forest zones and the open areas, including degraded lands, deforested and farmlands in the surrounding areas.
- Location of the holes caused by illegal logging, with high resolution observations
- Observation of the dynamic evolution of forests in time and definition of the causes.
- Observation of the modifications of the forest boundaries by natural and anthropic causes (vegetation fires or others).
- Observation of natural regeneration, including the change in sociophytology. The analysis of long term natural regeneration process will help identify the areas where natural regeneration is not occurring well, hence the need for intervention. Those areas with a good natural capacity for regeneration will be left intact to make sure the natural process of reconstitution of the ecosystem is maintained.

❑ Forest surveillance of protected areas

It is very important to observe both inside of the PA and their surrounding areas so that the process underway in these landscapes, for instance forest degradation, fires, etc. ... as well as the development of infrastructures, agriculture and urbanization do not affect the relevant protected areas. For this purpose, the need for high resolution image came up in order to monitor:

- Fires
- Illegal loggings
- Boats penetrating the marine PA and mangroves
- Illegal settlements

❑ Plan potential protected areas and develop land use scenarios

The combination of satellite data with data on biodiversity, land use, population and environment management goals might help identify the fields that might be considered as potential New Protected Areas (NAP) as well as inform on progress in landscape development. GFW can also plan an important role in this process for improved decision-making and planning thanks to the baseline data already available, such as the affectation of the forest concessions and fire warnings which might be completed and combined with such additional data as those on the occurrence of species, their distribution model, those related to protected areas in atlas.rebioma.net, etc.

3.1.1.6. The management targets and indicators of impacts

- Reduction of deforestation and forest degradation
- Increased biodiversity

- Increased carbon stock
- Effective forest surveillance
- Improved forest governance
- Increased participation of community members in forest governance
- Increased availability of information and improved communication of such information for forest governance

3.1.2. Use case 2: Forest resource management transfer

3.1.2.1. Field of geographic intervention

The natural resource management transfer is found throughout the country and affects areas managed by local grassroots communities. For the time being, no proper mapping document exists to present all the zones covered by these Management Transfers. Nevertheless, a thesis project on the evaluation of the TG is underway and plans to produce this map of the TG.

According to the information from the DGF, there are 1,200 to 1,300 TG throughout Madagascar and they cover a surface of approximately 2,500,000 Ha, i.e. 4% of the country.

3.1.2.2. Issues - stakes - challenges that GFW can contribute to solve

The regulations in effect which would help transfer the management to local grassroots communities have been in effect since 1996 by the GELOSE law (Secure local management) No. 96 025 of September 30, 1996, followed by the decree No. 2001-122 of February 14, 2001, determining the conditions for implementing the State forest contract management (GCF). These areas are managed by local communities or associations known as Vondron Olona Ifotony (VOI), Local Grassroots Community (CLB) and Grassroots communities (COBA).

Over the first years of experience in the field of management transfer, failures were recorded everywhere. The main causes are the low economic impact of the actions, low level of capacity building for the CLB, competition with other forest users (forest operators, population not integrated, traditions that advocate for the traditional use of forests).

Despite evidence showing that these initiatives have largely failed to protect the zones subject to management transfer, several community forest management contracts have been renewed and new contracts are being drafted. These failures can be largely tied to the inexistence of alternative to the subsistence needs of the communities that used the forest as well as the discrepancies between environmental stakes and local culture, land use and the solution to real estate problems.

The assessment of the management transfers by the Forest administration has shown the main issues in the process:

- Weakness of monitoring and control caused by the inability of the forest administration. However, we found out that the TG display good governance provided they receive support and supervision from specialized organizations. Conversely, if the TG are established by local initiatives or in remote areas, the results are not satisfactory;
To react to this, the Forest administration is now designing tools and policies aimed at improving the TG since many abuses have been noticed as to policy, illegal practice (scheming, fraud, etc.). Many monitoring evaluation tools have also been developed for this purpose;
- There is the least deforestation where the « alternative and safeguard » system is well established by the promoters of specialized TG (IGA and other motivating aspects).

3.1.2.3. The activities underway and efforts deployed integrating the process in which the GEF – GFW project can intervene

Throughout Madagascar, domestic and international non-profit organizations are committed to provide support to the management of the zones managed by the entities and associations. For instance, WCS works with the associations of GCF for the Makira REDD + project to support activities aimed at reducing deforestation.

The activities proposed in the RPP include the explicit integration of communities and COBAs so as to determine carbon stocks (via the results of forest inventories). Communities take part in the surveillance, notification and verification of income distribution, of payments for ecosystem services.

Some activities rather geared towards strengthening the economic benefits of the TG have also been completed; particularly in the areas surrounding the category VI protected areas where sustainable forest activities¹⁶² as well as the researches¹⁶³ on forest products are authorized. For instance, the VOI supervised by the GESFORCOM and COGESFOR projects, still in the context of the GELOSE law, have set up reasoned exploitation systems for lumber for forests managed by VOI in the forest massif of Ambohilero, Rural Commune of Didy, Alaotra Mangoro Region.

3.1.2.4. Description of the relevant layers of reference data

Tableau n°6.

Availability of information and gaps for the transferred forest management

Data layers	Information available	Information not available
Distributions of TGRF in space	- Geographic coordinates - Zoning map - Contract - PAGS	Compilation at the national level
Scope of the forest cover and the changes	- Map of the 2010 cover: ONE - DGF – FTM – MNP	Map of forest cover in 2014
Scope of the burnt surfaces		Level of the TGRF zones National level
Map of land use	IEFN map for 1996 and 2000	Update of the map of land use
Location of the transferred zones	Quantified data and geographic coordinates	Map of location digitized at the national level
Zones of access to resources	PAGS map	
Real estate map	PAGS map	

3.1.2.5. Proposed activities of the Global Forest Watch project

The combination of satellite data on TG sites, zoning, the managing population and management goals might help map the community-managed sites and inform on the influence zone of the Management Transfers. GFW can also play an important role in this process so as to improve decision-making and planning thanks to those baseline data already available, such as the boundary of protected areas and fire warnings that might be completed and combined with additional data like ecologic data, the zones subject to various pressures...

The needs in information particularly relates to:

- The monitoring of logging in the production zone
- The monitoring of reforestations
- The monitoring of the rights of use.

We have also found out that the administrative boundaries of FTM (BD 500) no longer match the reality. Border disputes sprung up everywhere and generate conflicts on forest resource management. An update is more than necessary.

□ Boundary of the TGRF zones

TGRF zones must be digitized with updated maps including all the categories of protected areas and exploitation zones (KoloAla sites), and stating the status of the zone allocated and the legal manager. Besides, it is necessary to adjust the changes of borders and land uses.

¹⁶² Authorization for any removal of forest products, even for economic purposes (logging, rights of use, GCF), under reserve of maintaining to natural condition of at least 2/3 of the PA

¹⁶³ Scientific research and maintaining the ecosystem, authorization of the Ministry in charge of forests and specific convention between the Ministry in charge of Scientific Research, the Ministry in charge of the Environment, the organization in charge of managing the network of PA, and the relevant research institutions

❑ Planning of TGRF zones, land use scenarios, protected areas and boundaries of potential REDD+ and biodiversity projects

The combination of the satellite data with the data on the TGRF aspects, biodiversity, land use, biomass, carbon stocks, population and environment management goals, might help identify potential fields (terrestrial landscapes) to be protected or managed by the communities, as well as design the related development plans, considering the possibility of development in terms of carbon and biodiversity projects.

❑ Monitoring-evaluation of forests in the TGRF zones.

GFW's satellite data can be used to observe the dynamics of forests and the implementation of the activities of forest surveillance in the zones of GELOSE and GCF contract as well as the surrounding areas. This includes:

- The identification and the mapping of the types of land use - the zones covered by the forest and the open areas, including degraded, deforested and farmlands;
- The observation of the forest dynamics and natural regeneration;
- The observation of the modifications of the forest boundaries by natural and anthropic factors (vegetation fires or others);
- The observation of the changes of vegetal cover and the evaluation of the erosion process.

Updating the data on forest cover (percentage of forest cover in the transferred zones) will help determine the scope of forest degradation in almost real time, in the transferred zones, to help analyze the causes.

❑ Surveillance of adjacent zones

It is very important to observe the areas surrounding the TGRF zones so the process underway in these landscapes – e.g. instance forest degradation, fires – as well as the development of infrastructures and agriculture do not affect the « buffer » zones.

❑ Forest reconversion

Some high resolution data will be necessary to detect and monitor the changes of forests caused by slash and burn farming, agricultural plantations.... the conversion of forests into agricultural land or logging taking place on a small-scale will not necessarily be detectable with the existing 500 m resolutions.

❑ Management targets and indicators of impacts

- Reduced deforestation and forest degradation
- Increased biodiversity
- Increased carbon stock
- Increased participation in forest governance by the entire local community (members and non-members)
- Increased availability of information and improved communication of these information for and on forest governance, forest use, and the markets for forest products

3.1.3. Use case 3: the REDD + projects

3.1.3.1. Geographical field affected

- Makira forest, possibly the national park of Masoala;
- Ankeniheny-Zahamena NAP (CAZ);
- Ambositra-Vondrozo forest corridor NAP (COFAV),
- Bekoratsaka, Sofia
- Beampingaratra, Anosy

3.1.3.2. Issues, stakes and challenges that GFW can contribute to solve

Each step of an AFOLU carbon credit project offers different challenges.

- In the development phase, role players must indicate the boundaries of the project that take into account the current land use, future needs of land use, and the various project goals. GFW might offer a user-friendly platform to accommodate these data layers, so that all stakeholders are aware of the different boundaries of the intervention zones of the different projects, including such data as the organization, supervision and management of the open areas as to the collection of forest resources, etc. GFW can also provide a visualization of the boundaries for the projects underway throughout the country.
- In the implementation, monitoring and verification phase pertaining to community actions, the sampling of biomass for carbon sequestration can complete the data on teledetection. Local bodies can also play a role in monitoring the biodiversity through the results of the forest inventory or reports of observations on the fauna. The GFW platform might provide to verification bodies, institutions, researchers and other interested parties, the real time visualization of the recordings of these data.
- The amortization of these REDD+ projects largely depends on the creation of sustainable carbon sequestration. In fact, forest loss can pose important challenges to the projects' viability. Besides, the GFW platform can give role players in the field some data in almost real time on the location and time where the loss of forest cover occurs.

3.1.3.3. The activities underway and efforts deployed integrating the process in which the GEF – GFW project can intervene

In July 2014, Madagascar has presented its Readiness Plan Proposal or RPP for the partnership funds for forest carbon. The first ideas in the program include integrating the spatial planning of REDD and improving forest governance. In addition, the World Bank has approved USD 42 million for the project to support the 3rd Environmental Program, while the World Bank's contribution for the protected areas now reaches USD 17.5 million.

The « conservation pacts » initiated with the partners (Conservation International, Durrell, Wildlife Conservation Society, ...) for a few years now in different regions of Madagascar have been established in order to strengthen the structuring and empowerment of the communities in forest resource management while providing sustainable solutions for the benefit of conservation and the populations. A conservation pact helps users of the resources and local communities to choose the conservation of these resources in exchange of benefits that compensate for their loss of earnings.

The experience with the 13 « conservation pacts » has shown positive impacts in the field, via the more accountable behaviors in favor of natural resources, as the populations are motivated by incentives to carry out conservation actions. From these experiences, one might think that this mechanism might be an effective instrument both for distributing the benefits of REDD+ and for monitoring/evaluating deforestation/degradation. In fact, this strengthening of the « conservation pacts » includes the introduction of deforestation and degradation monitoring by the communities themselves.

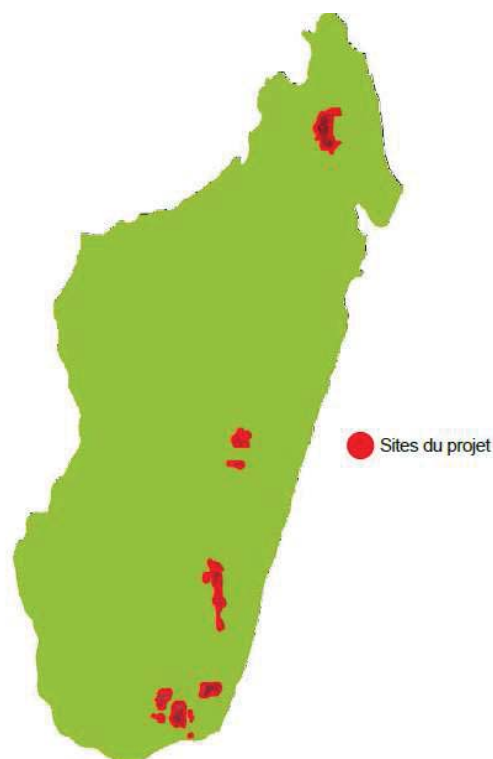


Figure 3. REDD Project sites in Madagascar

3.1.3.4. Description of the relevant layers of reference data

Tableau n°7.

Availability of information and gaps for the REDD+ project management

Data layers	Information available	Information not available
Project boundaries, including supervision (e.g., international NGO, organization of management by grassroots communities)	Map of the REDD+ projects	Current forest situation
Concessions	Map of KoloAla sites	Map of allocated exploitations
Protected areas	Map of the PA	Current forest situation
Forest cover	National forest cover	Current situation of forest cover
Forest cover loss and gain	Map of deforestation	Map of deforestation 2014
Biodiversity, including the density of species	Occurrence and distribution of a few species	Compilation at national level and by endangered species
Biomass Carbon stock	Tonnage Tonnage of carbon (aerial and soil biomass)	At the level of ecosystems: thorny forests, dry forests, mangroves
Fire warnings	Incidence of fire	Information on burnt surfaces
Rights of access to resources	Zone of TG	High resolution images

3.1.3.5. Proposed activities of the GFW project

Four (4) projects of AFOLU carbon credit are now underway in Madagascar through different types of forests. These projects are implemented by international organizations such as Wildlife Conservation Society and Conservation International, with the local community organizations, different levels of government and audit organizations.

The GFW project might contribute to creating a technical committee for data visualization and storage, including fire warning and forest cover loss. The technical committee should also help stakeholders and other interested parties monitor the project's progress, such as the reduction in deforestation rates, forest cover gains and carbon sequestration levels. These data can reveal the way the compensations can be distributed appropriately.

At the end of the day, the GEF – GFW project can provide support to the creation of reference level for those ecoregions not covered by existing funding:

- Thorny forests
- Dry forests of the west.
- Mangroves
- Support to the MRV (Monitoring – Reporting – Verification) process and inventory.

3.1.3.6. Management targets and indicators of impacts

- Reduced deforestation and forest degradation
- Increased biodiversity
- Increased carbon stock
- Enhanced use of the GFW platform by community organizations, governmental organizations and other forest management organizations
- Increased participation in forest governance by local community members and the poor
- Increased availability and communication of evidence for and on forest governance, logging, markets of forest products, and the value of forest products from people entitled to use the forests
- Change in the alignment of the policy between REDD + and other processes addressing land use within forests.

3.1.4. Use Case 4: Mangroves

3.1.4.1. Geographical field

Mangrove forests are mainly located along the west coast of Madagascar, with fewer sites along the east coast.

3.1.4.2. Issues, stakes and challenges that GFW can contribute to solve

In Madagascar, mangrove forests are threatened by the collection of wood to make charcoal and fuel wood, the conversion of mangroves into rice fields, intensified shrimp fishing and aquaculture in general. Urban development only makes this situation worse. Upstream soil erosion disturbs the coastal ecosystem. Yet, a study on mangroves in northwestern Madagascar reveals a « very important concentration of organic carbon in the mangroves and soils that they keep in place ». In the Ambaro and Ambanja Bay, the high-standing forests with closed canopy contain on average 147 mg/ha of carbon in their vegetation and 446 mg/ha in their soils. The perturbation of the superficial soil layers can lead to considerable greenhouse gas emissions into the atmosphere, responsible for climate change. Although mangroves represent only 3% of the world's forest cover, the loss of these habitats produces up to 19% of global emissions related to deforestation. Their destruction means more economic loss, estimated to be between USD 6 and 42 billion a year, particularly in the fisheries and aquaculture sectors.

3.1.4.3. The activities underway and efforts deployed integrating the process in which the GEF – GFW project can intervene

Presently, WWF, Blue Ventures and Honko manage projects to protect and restore mangrove forests. Activities aimed at improving local livelihood and the search for ways in which mangrove forests in Madagascar might be positioned within the REDD + landscape of blue carbon are underway. WWF also undertakes activities for a better management of mangroves, which are targeted by illegal logging to protect charcoal.

3.1.4.4. Description of the relevant layers of reference data

Tableau n°8.

Availability of information and gaps for the forest management of mangroves

Data layers	Information available	Information not available
Current data on land use	Map IEFN 2000	Update of data on land use
Forest cover	National forest cover	Current situation of the forest cover
Protected areas	Map of the PA	Current forest situation
Forest cover loss and gain	Map of deforestation	Map of deforestation 2014
Biodiversity, including density of species	Occurrence and distribution of a few species	Compilation at the national level and by endangered species
Carbon stock	Tonnage of carbon (aerial and soil biomass)	Update of the data
Fire warning	Incidence of fire	Information on burnt surfaces
Water quality		Water quality in

3.1.4.5. Proposed activities of the Global Forest Watch project

The Blue ventures, LRI (Laboratoire de Radios Isotopes) institutions have information respectively on the carbon stock in aerial biomass and in soils of the mangroves. These information need to be honed and improved by high resolution images. GFW can play an essential role in prioritizing the interventions in the field of the dry forest of the west.

High resolution images should not be limited to merely observing the fires. The other pressures should also be taken into account: incrustation of boats into the marine and coastal protected areas, illegal cutting and detection of settlements of criminals.

GFW can also contribute to drafting the mangroves development plans compared with the collection of wood to make charcoal and lumber (fence, poles, tool handles ...). We noted the existence of fire warning system but this latter is not used for field interventions, except only to assess the scope of the fires (fire monitoring...)

3.1.4.6. Management targets and indicators of impacts

- Reduced deforestation and forest degradation
- Increased biodiversity
- Increased carbon stock
- Increased income
- Improved marine environment
- Protection of upstream lands by an integrated management.
- Enhanced use of the GFW platform by community organizations, governmental organizations and other forest management organizations.

3.1.5. Use Case 5: Mines

3.1.5.1. Geographical field

Mining and oil concessions (exploration and exploitation)

3.1.5.2. Issues / stakes / challenges that GWF can contribute to solve

Mining activity (including oil) can disturb everything: land, marine, soil, air, freshwater, habitats, forests. Therefore, the biggest challenge lies in determining, extract and process mineral resources, while causing the least disturbance possible to our ecosystem. In 2000, pursuant to the law No. 98-031 of January 20, 1998, defining public institutions, the Malagasy Government has set up the Office of Mining Registry of Madagascar (BCMM) which is a public institution with an industrial and commercial nature. It is placed under the technical supervision of the Minister of Energy and Mines, according to the data on mining permits (license for research and/or exploitation, issued in compliance with the provisions of the Malagasy Mining Code). The data provided by the BCMM as of October 1st, 2008, inform us of the existence of the following mining titles and applications:

- The exploitation permit
- The permit reserved to Small scale operators
- The research permit
- The exclusive authorizations of reservation of perimeters
- The applications for exploitation permit
- The applications for permits reserved to small scale operators
- The applications for research permits
- The applications for exclusives authorization of reservation of perimeters

The industrial mining sector and the small-scale mining exploitations have caused important losses of forests of high conservation value in Madagascar. By the same occasion, the settlement of large mining facilities has caused the displacement of local communities, destroyed forest and agricultural spaces. Instance, the mining complex of Ambatovy has caused the loss of 785 Ha of rice field as they set up pipelines, causing a loss of production of 2,777 kg of rice (BIODEV2011).

Besides, illegal small-scale mining exploitation often occurs within protected areas, like the explosion of the exploitation of sapphire in the Ankeniheny Zahamena Corridor in 2013. The KoloAla site in Andilamena is also targeted by an illegal small-scale mining exploitation. These activities cause not only degradation and deforestation in the direct influence zone and the surrounding areas of the mining exploitation, but also as to ancillary infrastructure like pipelines, access roads and tailings dams. In addition, mining activities can cause soil erosion with downstream negative impacts.

3.1.5.3. The activities underway and efforts deployed integrating the process in which the GEF – GFW project can intervene

Rio Tinto QMM and Sherritt are two industrial mining companies operating in Madagascar. Both undertake the compensation of biodiversity for "zero net loss" in exchange for the destruction of habitat by mining activities. In 2011, the Extractive Industries Transparency Initiative has been suspended because of the political crisis in the country. In June 2014, the EITI has removed the suspension of Madagascar as political life came back to normal in the country, and considering the commitment to comply with the EITI's standards of transparency of mining incomes.

En 2009, Alliance Voahary Gasy (AVG) has trained over 30 national and local non-profit organizations and communities to support the participation of the civil society in the accountable management of natural resources. Alliance Voary Gasy has since drafted a framework for guiding the development of good governance for the economic and environmental policies of extractive industries.

3.1.5.4. Description of the relevant layers of reference data

Tableau n°9.

Availability of information and gaps for the management of the mining activities

Data layers	Information available	Information not available
Mining registers (e.g. type of concession, small scale exploitations, mining plots)	Geographic coordinates of the mining plots and blocks	Mapping of the mining plots and blocks
Intact forests	Global level	National level
Protected areas	Map of the PA	Current forest situation
Forest cover	National forest cover	Current situation of the forest cover
Soil erosion	Data very localized according to vegetal covers and land use	Soil erosion in the large catchment areas
Biodiversity, including the density of species	Occurrence and distribution of a few species	Compilation at national level and by endangered species
Water quality		Water quality in terms of silting and chemical disturbance
Carbon stock	Tonnage of carbon (aerial and soil biomass)	At the level of ecosystems: thorny forests, dry forests, mangroves
Fire warning	Incidence of fire	Information on burnt surfaces
Rights of access to resources	Zone of TG	
Rights of access to land	Zone of TG (SFR)	

3.1.5.5. Proposed activities of the Global Forest Watch project

❑ Evaluation and forest surveillance

The GFW satellite data can be used to observe the dynamics of forests and the implementation of the forest surveillance activities. This includes:

- Updating and adjusting forest borders compared with industrial mining settlements;
- Identifying and mapping the different types of land use and their change;
- The real estate system;
- The correct information on the land use will help improve the planning and control of unauthorized activities, such as illegal small-scale mining activities.

This will also help collect data related to the forest for the indicators of biodiversity, such as landscape fragmentation, zones with high conservation value, intact forest landscapes, and the important forests for the stability of the catchment area.

❑ Monitoring and evaluation of concession zones

The data from satellites as well as the reference data can be used to analyze the old and newer information on the concession zones (both for exploration and active mining exploitation) in order to analyze the impact. The need in intervention pertains to:

- The boundaries of the allocated zones (plots and blocks)
- The monitoring-control of the mining plots

❑ Planning of the surveillance

The ONE, which is responsible for the surveillance of the environment, can use the satellite data for the general observation of the forest and the fragmented zones. This observation might become grounds for planning surveillance. Satellite images will make it possible to observe both the dynamic evolution of the forests in time, and the remote areas, difficult to access. A higher resolution would allow for a more accurate observation.

❑ Public information and participation

The data of the extractive industries might be included in the national database of the environment, integrating all available information related to forests. This might include the information regularly updated on the permits issued as well as the related documents such as: the names of license holders, the plans and maps of the concession zones. Such information as well as the satellite data on the forest cover and the evolution of forests will help the NGOs and the communities to carry out an alternative monitoring of the relevant areas and help them get more actively involved in management and decision-making. With different levels of access to data, the data portal can become an effective tool for sharing information among the offices in charge and, eventually, facilitate public participation in assessing all related information available.

❑ Planning of the biodiversity management

By identifying the forests and habitats with high conservation value and by combining these information with the data on biodiversity, land use, the environment, and the socio-economic goals, this process inform on the boundaries of the concession zones, in addition to planning for conservation banks.

3.1.5.6. Management targets and indicators

- Better mining governance
- Reduced deforestation
- Reduced pollution.
- Concerted development of space.

3.1.6. Use case 6: EIA monitoring

3.1.6.1. Geographical field affected

Industrial concession zones, road axis, development and residence areas, zones of development of tourist activities, establishment of New Protected Areas...

3.1.6.2. Issues - stakes - challenges that GFW can contribute to solve

In the context of a research and application of a high growth economic policy, Madagascar is calling on international investors to carry out large mining, industrial and tourist projects. These activities affect environmental integrity and cause huge prejudices to conservation and biodiversity forest. All that goes against the international commitments made in favor of the protection of Nature.

Therefore, for the sake of good environmental governance, Madagascar has adopted the MECIE decree (decree No. 99-954 of December 15, 1999, modified by the decree No. 2004-167 of February 3rd, 2004, related to the compliance of investments with the environment (MECIE decree) which aims at determining the rules and procedures to be followed upon ensuring compliance of investments with the environment (MECIE) and determine the nature, respective attributions and the degree of authority of the institutions or organizations affected by the MECIE.

3.1.6.3. The activities underway and efforts deployed, integrating the process in which the GEF - GFW project can intervene

All activities mentioned below or reaching one of the following thresholds are subject to the environmental impact assessment:

- All developments, infrastructures and works likely to affect sensitive zones;
- All plans, programs or policies likely to modify the natural setting or the use of natural resources, and/or the quality of the human environment in urban and/or rural setting;
- Any use or transfer of technology likely to have adverse consequences on the environment;
- Any storage of any liquid beyond 50,000 m3;
- Any regular and frequent or one-time commercial transportation by road, railroad or air of hazardous materials (corrosive, toxic, contagious or radioactive, etc.);
- Any displacement of population of over 500 individuals;
- The developments, infrastructures and works likely, because of their technical nature, their scope and the sensitivity of the settlement area, to have adverse consequences on the environment.

Efforts have been made in the field of monitoring of mining activities pertaining to the environment and forests:

- Completion of environmental assessment EES for World Bank projects (PRSM and PGRM) to develop and rule over the mining sector;
- Manuals, guidelines and guides for the EIE of mining activities - operational regional mining environmental bodies;
- Creation and implementation of the Interdepartmental Mining– Forests Committee (CIMF) to harmonize the management tools of both sectors and process cases of disputes
- Manual of procedures to address the overlapping of the mining zones with forest zones for New Protected Areas and KoloAla sites – interdepartmental orders on the suspension of issuance of mining permits in some forest zones (since 2004) - Protocol of data exchanges between both Ministries.

3.1.6.4. Description of the relevant layers of reference data

Tableau n°10.

Availability of information and gaps for completing the
EIE

Data layers	Information available	Information not available
Location of zones transformed by human settlements (roads, mines, plantation, New Protected Areas...)	Data and maps not updated	Update of the mapping of the transformed zones at the national level
Intact forests	Global level	National level
Protected areas (MNP and NAP)	Map of the PA and NAP	Current forest situation
Forest cover	National forest cover	Current situation of the forest cover
Biodiversity, including the density of species	Occurrence and distribution of a few species	Compilation at national level and by endangered species

3.1.6.5. Proposed activities of the Global Forest Watch project

- Monitoring of the enforcement of the PGEP (Project Environmental Management Plan) which makes up the environmental specifications of the said project and includes a program to implement and monitor the measures planned by the EIE to remove, reduce and possibly compensate for the adverse consequences of the project on the environment;
- Monitoring of the enforcement of the PREE (Environmental Commitment Program): a program directly managed by the environmental unit of the ministry in charge of the activity, which consists in the promoter's commitment to take some measures to mitigate the impacts of its activity on the environment, as well as possible measures to restore the implantation site to its original condition.
- Monitoring of the PGEES (Environmental Management and Social Safeguard Plan)
- Monitoring system of integrated impacts: social, economic and ecological

3.1.6.6. Management targets and indicators

- Reduced deforestation and forest degradation
- Enhanced biodiversity conservation
- Reduced pollution
- Enhanced protection of biodiversity
- Developed social and human protection

3.1.7. Use Case 7: management of catchment areas and water resource

3.1.7.1. Geographical field affected

- For agricultural waters: in the field of irrigated perimeters, coastal zones upstream from mangrove ecosystems, inside zones (Ambatondrazaka, Andapa...)
- For potable water and sanitation: potable water collection area and zones upstream from water sources.

3.1.7.2. Issues - stakes - challenges that GFW can contribute to solve

Renewable water resources are estimated to be 337 km³/year. Renewable surface water resources are assessed at 332 km³/year, while underground resources are at 55 km³/year, with a common part between surface waters and underground waters estimated at 50 km³/an. The main large and small rivers drain close to 335,405 km² of catchment areas, i.e. 57 per cent of the country's total surface. The thirteen (13) most important intake barrages have a total capacity of approximately 493 million m³, of which 108 million are allocated to irrigation and 385 million to hydro-electricity.

The spatial situation of irrigation is as follows:

- Large irrigated perimeters (GPI) of unit surface above 2,500 ha.
- Small irrigated perimeters (PPI) between 200 Ha and 2,500 ha.
- Micro-irrigated perimeters (MPI) below 200 ha.
- Family perimeters (PF) (a few hundred m²) which might cover a total surface of 300,000 ha.

The development of the Malagasy agriculture is limited by the serious degradation of natural resources. Because of demographic pressure, areas that are increasingly unfavorable on hills are used as farmlands, with devastating practices for the environment: practice of slash and burn agriculture, overexploitation of fragile soils on slopes by repeated food crops. The result is a rapid decrease of soil fertility on the hills and the phenomena of erosion that threatens the irrigated areas downstream and taking its toll on their maintenance cost as well as on their sustainability: silting of the perimeters, increased runoff, decreased debit and low level the of watercourses that supply the irrigation systems. Soil erosion from the highlands causes considerable damages on the bottomlands of coastal plains and pollutes both the coastal zones and the marine ecosystem.

The hydrographic networks, water sources for food and agriculture, are subject to various exploitation which can affect the soil and the environment quantitatively and qualitatively. These activities include mainly the hydro agricultural and hydro electrical dams, the discharging of wastes from industrial and agricultural facilities (excessive fertilization of plantations). The availability of source water is also influenced by the way catchment areas are treated. Thus, the massive deforestation of catchment areas limits soil infiltration and depletes source waters. Consequently, holes appear and low flow extends. Finally, climate change affects the availability of water both for food and agriculture.

3.1.7.3. The activities underway and efforts deployed, integrating the process in which the GEF - GFW project can intervene

The Water and sanitation databank (BDEA) is available to the Ministry of Water:

- Water points
- Stand posts
- Latrines

This information is not yet in network.

The activities in the field of development of catchment areas relate to several topics:

- Development of forest valleys in the context of the development projects (Swiss Cooperation, SAF FJKM, JICA, CIRAD...)
- Promotion of agroforestry and agro biological management of soils
- Plantation of forest trees
- Reforestation and plantation of forest trees
- Drafting a development scheme
- Technical capacity building for farmers

In the field of the water and sanitation, the water management in Madagascar is subject to the law No. 98 – 029 on the Code of Water. This latter states that the following are considered as public domain: water, the management, conservation and development of water resources, the organization of the public service of potable water and collective sanitation of household waste waters, water police, funding for the water and sanitation sectors, the organization of the water and sanitation sectors.

Article 25 of the Code of Water gives an illustration of the interdependence of water management and forest: « In compliance with the provisions of the forest policy, the highly protective role of a forest cover, or at least that of a thick herbaceous cover over the basins, as well as the protection against erosion and the silting of the hydro electrical infrastructures and downstream irrigated perimeters, is of public interest and will be subject to specific consultation measures, in order to **maintain the standards of water quality, regulate hydrologic systems and prevent serious floods** ».

3.1.7.4. Description of the relevant layers of reference data

Tableau n°11. Availability of information and gaps for catchment area and water resource management

Data layers	Information available	Information not available
Geographical data on large catchment areas		Mapping of large catchment areas (hydro agricultural and hydro electrical) and water basins Digital model of the land
Hydrological data	Hydrological map of Madagascar	
Topographical data	Map of the slopes	Digital model of the land
Pedagogical data	- Map of Madagascar's soils - Map of physical potentials	
Geological data	Geological map of Madagascar	
Map of land use	Map IEFN 1996 - 2000	Update of the data and map of land use
Forest cover	National forest cover	Current situation of the forest cover
Soil erosion	Very localized data according to vegetal covers and land use	Soil erosion in large catchment areas
Rights of access to resources	Zone of TG	
Rights of access to land	Zone of TG (SFR)	
<ul style="list-style-type: none"> – Extent of forest cover – Extent of the changes in forest covers – Access to resources 		

3.1.7.5. Proposed activities of the Global Forest Watch project

The need for information on soil erosion and the status of water is also felt at the national level. For this purpose, we recommend using the SWAT model (Soil and Water Assessment Tool). The Polytechnic college of Antananarivo has a competence in the field of SWAT.

The GEF - GFW project can also contribute to:

- monitoring the changes of land use;
- the environmental impact assessment for large scale agricultural developments on the natural resources within large catchment areas;
- the evaluation of soils and waters under different types of use (use of SWAT software).
- the monitoring of water quality;
- the availability of data on the evolution of forest covers in hydro agricultural and hydro electrical catchment areas.

3.1.7.6. Management targets and indicators

- Reduced deforestation and forest degradation
- Changes in land use
- Reduced erosion and pollution
- Enhanced protection of biodiversity
- Developed social and human protection

3.1.8. Use case 8: Production forests

3.1.8.1. Geographical field affected

Forest zones under KoloAla sites

3.1.8.2. Issues - stakes - challenges that GFW can contribute to solve

Considering all the aspects of conservation and valorization of natural resources, the Directorate General of the Environment and Forests (DGEF) has initiated in 2006 the creation of a national network of Sustainable forest management sites (SGFD), later called « KoloAla sites ». The « KoloAla » concept has been designed to achieve balance between strict conservation and the valorization of these resources for a sustainable management of natural resources applied in Madagascar. Following are the principles:

- Integration of the identification of the SGFD in the procedures of forest zoning, just like that of protected areas, the restored areas and reforestation;
- If necessary, integrate of protection zones inside a SGFD;
- If possible, valorize the existing forest status (classified forest, forest reserve)

The goals of the following KoloAla sites would make up the challenges that the GFW project should contribute to achieve by monitoring deforestation and looking for alternatives:

- Participation in the conservation of national forest resources;
- Sustainable exploitation (according to an exploitation and development plan complying with standards) of ligneous forest products outside current and potential PAs;
- Rational economic valorization of ligneous and non-ligneous forest products;
- Long term maintaining of the production potentials in forest goods and services.

3.1.8.3. The activities underway and efforts deployed, integrating the process in which the GEF – GFW project can intervene

In the field of forest surveillance and control, the forest administration has established a participatory control system involving grassroots communities and local authorities. The forest tax system has also been improved so as to motivate the affected entities in forest surveillance and control. However, the data of Global Forest Watch show losses of forests and fires taking place in the zones covered by the forest massifs, regardless of their status (Protected areas, KoloAla sites, transferred forests ...).

3.1.8.4. Description of the relevant layers of reference data

Tableau n°12. Availability of information and gaps for the forest management concessions

Data layers	Information available	Information not available
Map of KoloAla sites.	<ul style="list-style-type: none"> - Boundaries of the PA (digital) - Categories - Managers - Surfaces 	
Map of KoloAla sites effectively exploited (forest concessions)	<ul style="list-style-type: none"> - Boundaries of the PA (digital) - Reference status 	<p>Mapped boundaries of forest concessions</p> <p>Status of protection inside and around</p>
Map of the forest cover	<ul style="list-style-type: none"> - Map of the cover 2010: ONE – DGF – FTM - MNP 	Map of the forest cover 2014
Change of the forests	<ul style="list-style-type: none"> - Map of the cover 2010: ONE – DGF – FTM - MNP 	Map of the forest cover 2014
Intact forests	<ul style="list-style-type: none"> - Global level 	National level
Map of the land use	<ul style="list-style-type: none"> - IEFN 2000 	Update of the land use
Plantation forests	<ul style="list-style-type: none"> - Quantified data 	Map of the plantation forests

Agricultural plantation	- Quantified data	Map of agricultural plantation
Biodiversity	- REBIOMA: Occurrence and distribution of species	Occurrence and distribution of species at the national level
Rights on resources	- Local level: Simplified development and management plans of grassroots communities	Compilation at the national level
Real estate rights (SFR)	- Local level: Simplified development and management plans of grassroots communities	Compilation at the national level

3.1.8.5. Proposed activities of the Global Forest Watch project

❑ Update of the information on the KoloAla sites (existing data)

With the DCSAPM's support, updates on the KoloAla sites are necessary as to the sites allocated to successful bidders and/or communities under GCF contract. It is also necessary to assess the current status of potential KoloAla sites that are not allocated so as to determine their biological and forest integrity.

❑ Monitoring - evaluation of the forests in the KoloAla sites

The priority for the site management is to maintain as best possible the natural ecological functions by applying reasoned valorizations of forest resources. The forest surveillance in KoloAla sites is essential for observing the natural process and planning the measures to be undertaken consequently (adjustment of the development schemas and plans). The GFW satellite data can be used to observe infringements, forest dynamics and the implementation of the surveillance activities. This includes:

- Identifying and mapping the types of land use - the zones covered by the forest and the open areas, including degraded lands, deforested lands and farmlands in the surrounding areas;
- Locating the holes caused by logging violations through high resolution satellite observations;
- Observing the dynamic evolution of forests in time and define its causes;
- Observing the modifications of the forest boundaries by natural and anthropic causes (vegetation fires or others);
- Observing the natural regeneration, including the change of species pursuant to logging or destruction.

❑ Surveillance of adjacent zones

It is very important to observe the areas surrounding the protected areas so that the process underway in these landscapes – such as forest degradation, fires, etc., as well as the development of agricultural and urbanization infrastructures in the adjacent zones – does not affect the relevant protected areas.

❑ Plan for potential KoloAla sites and develop land use scenarios

The combination of satellite data with data on the biodiversity, land use, population and the management goals of the environment might help identify the fields which might be considered as new KoloAla sites; while also informing on the progress in Landscape Development. GFW can also play an important role in the decision-making and planning, through a multi-variable analysis of setting up the KoloAla sites in the priority sites.

3.1.8.6. Targets and indicators

- Reduced deforestation and forest degradation

- Increased biodiversity
- Increased carbon stock
- Effective forest surveillance
- Improved forest governance
- Increased availability of information and improved communication of such information for and on forest governance.

3.1.9. Use Case 9: Landscape planning (Intersectoral-based landscape planning)

3.1.9.1. Geographical field affected

Landscape development affects both national and local levels.

3.1.9.2. Issues / stakes / challenges that GWF can contribute to solve

Economic recovery should be grounded in good spatial planning of development. ~~In fact, the Malagasy Government should apply to foreign and domestic investments in order to start up the national economy.~~ The spatial arrangement of said investments requires an accurate and transparent development policy focused on national and regional priorities. Without accurate and diversified information, it is difficult to achieve adequate spatial planning free from any coercion. Such information mainly pertains to: land use, real estate, forest infrastructures and resources. GFW can intervene by overlapping multiple layers of information designed to improve decision-making.

3.1.9.3. The activities underway and efforts deployed, integrating the process in which the GEF – GFW project can intervene

Landscape development pertains to a concerted management of the entire space and landscape. It is a reflection of the country's development options and is an essential means in the field of regional development (decentralization, planning). Each region now has a Regional Development Plan (PRD) and Regional Schema of Landscape Development (SRAT). These plans are supposed to be updated in order to be relevant to the region's economic and social contexts as well as to national development policies. At a local scale, each commune also has its Commune Development Plan (PCD) which is now being updated.

Within the FTM, the available information is made up of three « vector » databases, two of which cover all of Madagascar: BD500 and BD200. Initially printed at the base of the 1: 500.000 digitized maps (respectively at 1: 200.000), they have been completed in an advantageous manner and updated by exogenous data. But for now, the BD100 covers the protected areas of Madagascar. An Urban Database on the city of Antananarivo will also be available soon. These « vector » databases are available in the following formats: Arc/Info, MapInfo, and DXF...

Besides, FTM has a number of topical maps for professional use: maps of vegetation for the **National Ecological and Forest Inventory** in 1996-97, available all over the country; maps of water and land resources going back to 1994 for some areas.

3.1.9.4. Description of the relevant layers of reference data

Tableau n°13. Availability of information and gaps for landscape development

Data layers	Information available	Information not available
Map of forest cover	- Map of coverage 2010: ONE – DGF – FTM - MNP	Map of forest cover 2014
Hydrological resources	- Map of large catchment areas	Location of water and hydro-electricity basins
Landscape development	- National landscape development plan - Regional schema of	Update: - National landscape development plan

	landscape development - Regional Development Plan	- Regional schema of landscape development - Regional Development Plan
Geological data	Geological map of Madagascar	
Map of land use	Map IEFN 1996 - 2000	Update of the data and map of land use
Road infrastructure	- Road maps	Update of the national map of road infrastructures
Mining registers	- Geographic coordinates of the mining plots and blocks	Update of the maps of the mining plots and blocks

3.1.9.5. *Proposed activities of the Global Forest Watch project*

- ❑ **Update of the PRD (Regional Development Plan), SRAT (Regional Schema of Landscape Development), PCD (Commune Development Plans)**

GFW presents itself as an effective means an accurate analysis of the information necessary for decision-making and a better control of the spatial-temporal planning of changes in the targeted area.

- ❑ **Surveillance of overlapping**

By providing layers of spatial information (roads, forests, cities, demography, land use...) available and by working on an advanced geographical information system, GFW allows visualizing the constraints and potentials of development.

- ❑ **Technical support and capacity building for technicians of the Ministry and related organizations**

The GEF - GFW project will be able to contribute to the technical capacity building of stakeholders in the field of satellite image processing and geographical information system.

3.1.9.6. *Management targets and indicators*

- Improved spatial management
- Improved spatial governance
- Effective law enforcement
- Communication
- Adequate management of intersectoral-based information (availability)
- Enhanced consultation of different stakeholders in the forest field

3.2. **Description of the main role players / potential partners**

3.2.1.1. *Ministry of the Environment, Ecology and Forests*

The Ministry of the Environment, Ecology and Forests (MEEF) is in charge of designing, coordinating, implementing and monitoring-assessing the Government's policy in the field of the environment and forest resources. Its mission is to « *Safeguard Madagascar's unique environment and wealth for present and future generations* ».

The Ministry's goals are to:

- develop the required institutions and regulatory frameworks to protect the Environment and Nature;
- put an end to deforestation and bushfires;
- promote the rational management of natural resources by communities;
- ensure the financial sustainability of forest and environmental actions;
- ensure good environmental and forest governance;

- take up the protection, conservation and valorization of the Environment by appropriate measures;
- create the favorable environmental conditions for rapid and sustainable development;
- ensure the creation of a rigorous and effective organization to help improve the procedures for enforcing the regulations on the compliance of investments with the Environment;
- promote the main tools to implement the forest policy (le National Master Forest Plan and the Regional Master Forest Plan);
- promote the main tools to implement of environmental policy, the actions of prevention, sensitization, studies and researches in the field of the fight against pollution and the protection of the Environment, in collaboration with the relevant private organizations and associations.

Forests belong to the Malagasy Government. This latter is represented by the Ministry in charge of forests, which is the ultimate entity responsible for the forest sector. By its competences, it is responsible of for the control and ensures the enforcement of the laws on forest management and forest products. It can delegate its management powers to requesting institutions or individuals according to article 24 of the law No. 97-017 of August 8, 1997, reviewing the forest legislation: « the Government's forests can be managed by delegation. The Government can delegate the management of its forests to other public or private individuals. A decree issued during a Cabinet Meeting shall determine the procedures for delegation ».

The Directorate General of Forests has departments focusing on the responsibilities related to forest resource management:

- DCSAPM
- DVRF
- DREF
- Finally, the DGF has an office in charge of Forest Database Management located in Antananarivo

3.2.1.2. State Ministry in charge of Infrastructures, Equipment and Landscape Development

The State Secretary supervised by the Prime Minister in charge of the development of infrastructures and landscape and in charge of:

- controlling the key bodies and projects of the Overall State Policy, for a better distribution of the wealth and means through a streamlined optimization of landscape development;
- promoting and coordinating the constructions of the large public and private infrastructures;
- identifying and harmonizing the management of growth spaces;
- preparing the national directions, the planning and the coordination of public investments in the field of development and of landscape development, so as to cut down on poverty;
- consolidating the landscape planning tools for a contributive, harmonious and balanced landscape development;
- completing new large road projects, redevelopment and extension of airports, ports, and large construction works of hydraulic dams, hydro agricultural networks, equipment as well as urban and rural housing developments.

3.2.1.3. Ministry of Agriculture

Mission: direct, coordinate and implement the Malagasy Government's policy in the field of agriculture and rural development, including the agronomic research giving priority to food and nutritional security while considering the context of climate change. The Ministry's specific goals are to:

- Ensure the achievement of the major development goals for the agricultural sector and rural development, namely;
- Contribute to food and nutritional security, and reduce risks for the vulnerable;
- Improve the incomes of agricultural producers and provide employment to the rural population;
- Increase productivity in a sustainable manner, and develop competitive production systems;
- Extend and perpetuate standardized production spaces/zones and operational infrastructures;
- Develop access to domestic markets and contribute to improved trade balance;

- Improve the governance of institutions and role players, and strengthen their capacity

The MinAgri, through the BVPI program, ensures the completion of the letter of the development policy for catchment areas and irrigated perimeters in Madagascar. The project operates in four zones with high potentials for agricultural production: Andapa (Sava Region), Marovoay (Boeny Region), the Itasy Region, and Lake Alaotra (Alaotra Mangoro Region). Following are the program's overall goals:

- Sustainable improvement of the living conditions and incomes of those rural population in the catchment areas and integrating the irrigated perimeters in the four areas listed above;
- Better and sustainable valorization of natural resources.

This program has three technical components:

- Development of the landscape of catchment areas
- Sustainable systems for agricultural production
- Improved irrigated perimeters

3.2.1.4. Public and private institutions and organizations

❑ National Office of the Environment

The National Office of the Environment (ONE) is a public organization created in 1990 and subject to the decree No. 2008-600. In the field of information, the ONE ensures the management of the Environmental Information Systems, the monitoring and evaluation of the status of the environment to support the environmental assessment and for a better decision-making at all levels. For this purpose, the ONE:

- Manages, coordinates and deploys the environmental data and information system;
- Prepares, produces and updates the national and regional environmental specifications, and the reports on the status of the environment in Madagascar;
- Develops systems for the environmental watch, namely the observatory of the status of the environment.

As to the prevention of the environmental risks in public and private investments and the fight against pollutions, the ONE ensures the implementation of the MECIE decree as a delegated project manager and one-stop shop. Thus, the ONE:

- proposes threshold values and drafts reference environmental standards as well as environmental technical guidelines, in collaboration with the relevant sector-based Ministries;
- watches over the prevention of the risks of degradation of the environment by coordinating the monitoring of the Environmental Management Plans (PGE) and suggesting sanctions or adequate measures;
- promotes the Strategic Environmental Assessment (EES);
- provides advices and expertise.

❑ Madagascar National Parks

This private Association has been recognized as being useful to the public through the decree No. 91-592 of December 4, 1991. Through its bodies, the association focuses on protecting the ecosystems in protected areas, on researches dedicated to scientific progress, to environmental education and to the valorization of protected areas by ecotourism.

MNP now manages fifty six (56) protected areas, namely:

- 19 national parks
- 5 integral national reserves
- 23 special reserves
- 9 PA under an order for overall protection

3.2.1.5. Local communities managing RNRs (Vondron'olona ifotony VOI)

The VOIs are subject to the decree No. 2000-027 of January 13, 2000, on grassroots communities in charge of the local management of renewable natural resources. According to article 2 of this decree, the

grassroots community is a voluntary group of individuals united by the same interests and subject to the rules of communal life. According to the case, it gathers inhabitants of a hamlet, a village or a group of villages. It is considered as a private individual.

Pursuant to the law No. 96 025, Art. 43 – Starting from its notification, the authorization provides the beneficiary grassroots community, during the period stated in the deed, with the management of the access, conservation, exploitation and valorization of the resources subject to the management transfer, under reserve of compliance with the prescriptions and rules of operation as defined in the management contract. The COBA is required to comply with the stipulations and clauses of the management contract and the specifications previously negotiated and agreed among the parties. The obligations of the COBA include the application of the PAGS and the obligation to report on its activities.

3.2.1.6. NGOs and cooperation projects

The peculiar interests in the wealth of Madagascar's biodiversity, which is important worldwide, attract conservation and development organizations to be involved in its conservation. Their activities are focused on the protection of the biodiversity through the protected area management, support to local communities for development, the management of the natural resource-related industries (fuel wood, non-ligneous forest products ...). Such NGOs namely include: WWF (World Wildlife Fund for Nature), WCS (Wildlife Conservation Society), CI (Conservation International), and GoodPlanet, Durrell, Terra, PHCF... and many others.

Bilateral cooperation projects also partake in the conservation of Nature and in local development in Madagascar. They review the establishment of sustainable natural resources management structures: German, French, Swiss, American, Japanese cooperation... etc.

4. Pilot site

The GFW system is characterized by the possibility of monitor forest information at different scales: global, regional (east Africa, Oceania...), national and local (great basin or region). Decision-makers (political and technical) can collect the information according to their need and the target level. Thus, with the GFW, it is possible to determine a zone where deforestation will be monitored and use this information based on the planning needs by overlapping them with other layers of information (e.g. land use, demography, infrastructure...). The choice of the sites should be determined by the presence of a larger number of cases of use and the needs in information.

Pursuant to the discussions with stakeholders, many of them suggest the field of dry forests in the west. This choice is dictated by:

- Poor availability of environmental information;
- The importance of biodiversity;
- Scarce interventions in the field of biodiversity management and conservation compared to the eastern zone;
- The importance of subsistence agriculture;
- The existence of large catchment areas (Mangoky, Mahavavy, Morondava, Betsiboka basins) upstream from agricultural perimeters (Lower-Mangoky, Dabara, Namakia, Marovoay...);
- The existence of protected areas threatened by the vegetation fires;
- The existence of oil exploration zones.

5. Participation/Responsibilities of stakeholders

A consultation of the stakeholders has been organized during this phase for preparing the project document. The goal is to collect the relevant information required for implementing the GFW project in Madagascar. This would allow for a better targeting of the activities to be completed in the context of the

project. The consultation has also been necessary to evaluate the possibilities of stakeholder participation in the project. This consultation has been rich in information and highlighted the interest among many stakeholders. The consultations of the institutions were very broad-based because of the multisectoral nature of the project's approach:

- Government institutions;
- organizations and associations managing protected areas;
- International NGOs working in natural resource management and delegated to manage forest fields, whether NAP or REDD Projects;
- Autonomous public organizations.

At the end of the consultation, we noticed the following findings by stakeholders:

- Information on deforestation and topics related to degradation and that of the environment does exist but is neither exploited nor updated, and is located within different institutions or offices. However, there are efforts designed to collect and update the information (management transfer, deforestation, monitoring evaluation and environmental impact assessment...)
- Almost general interest among stakeholders in completing this project. In fact, there is an unanimous need for information (availability, relevance, easy access, rapidity, regional and national)
- However, we noticed the existence of a concern on the risk of duplicate and not complementarity, particularly as to data collection. This is justified by the works by the ONE – FTM – DGF on the evaluation of deforestation between 2005 and 2010; while the evaluation of deforestation between 2010 and 2014 is now underway. We need to point out that the ONE also uses high resolution means and technologies.

The following table provides the distribution of the institutions intervening according to the Use case affected.

Tableau n°14.

Table of the institutions compared with Use case

Institutions	Use case
MEEF – DGE – DGF– DCC	Use case 1: Protected area management Use case 2: Forest resource management transfer Use case 3: REDD+ Project Use case 4: Mangroves Use case 5: Mines Use case: Environmental impact monitoring Use case 7: Management of catchment areas, water and sanitation Use case 8: Forest production
State Ministry in charge of Infrastructures, Equipment and Landscape Development	Use case 5: Mines Use case 6: Environmental impact monitoring Use case 7: Management of catchment areas, water and sanitation
DGF/SAPM	Use case 1: Protected area management Use case 6: Environmental impact monitoring
DGF/SGBDF	Use case 1: Protected area management Use case 2: Forest resource management transfer Use case 8: Forest production
DGEF/DVRF	Use case 2: Forest resource management transfer Use case 8: Forest production
DGF/DREF	Use case 1: Protected area management Use case 2: Forest resource management transfer Use case 3: REDD+ Project Use case 4: Mangroves Use case 8: Forest production

DGF/REDD+ Project MinEnergie and Mines MinAgri (BVPI- Environmental body)	Use case 3: REDD+ Project Use case 5: Mines Use case 6: Environmental impact monitoring Use case 7: Management of catchment areas, water and sanitation
Min water	Use case 7: Management of catchment areas, water and sanitation
COBA	Use case 2: Forest resource management transfer Use case 3: REDD+ Project Use case 4: Mangroves Use case 6: Environmental impact monitoring Use case 8: Forest production
ONE	Use case 3: REDD+ Project Use case 5: Mines Use case 6: Environmental impact monitoring
MNP	Use case 1: Protected area management Use case 4: Mangroves Use case 6: Environmental impact monitoring
ONG (WWF-WCS-CI- Fanamby-Blue venture – GoodPlanet – Asity, ETC Terra, PHCF...)	Use case 1: Protected area management (NAP) Use case 2: Forest resource management transfer Use case 3: REDD+ Project Use case 4: Mangroves Use case 6: Environmental impact monitoring Use case 7: Management of catchment areas, water and sanitation
Project (GIZ – CIRAD – Intercooperation- JICA- USAID	Use case 2: Forest resource management transfer Use case 4: Mangroves Use case 6: Environmental impact monitoring Use case 7: Management of catchment areas, water and sanitation Use case 8: Forest production
CTD	Use case 1: Protected area management Use case 2: Forest resource management transfer Use case 3: REDD+ Project Use case 4: Mangroves Use case 5: Mines Use case 6: Environmental impact monitoring Use case 7: Management of catchment areas, water and sanitation Use case 8: Forest production
UNDP	Use case 1: Protected area management (NAP) Use case 2: Forest resource management transfer Use case 6: Environmental impact monitoring
FAO	Use case 8: Forest production

The following table provides a prospective overview of the possibilities of stakeholder contributions in completing the GFW project in Madagascar. These proposals will be subject to discussions and exchanges during the validation workshop.

Tableau n°15.

Potential partner institutions

Institutions	Field of intervention	Inputs
MEEF	Ministry in charge	- Structure in charge of the project - Promote dialogue on governance and on the sustainable valorization of the RNR.
State Ministry in charge of	National landscape management and	- Participate in the GFW planning platform.

Institutions	Field of intervention	Inputs
Infrastructures, Equipment and Landscape Development	planning	- Provide the information in the field of national planning
DGE	Department in charge	- Supervise the project activities.
DCC	Coordination of actions on the CC	- Project focal point - Coordinate project activities Supervise the DT and STD's intervention
DGF	SAPM	- Leads, coordinates and/or support the creation of NAP - Monitors the evolution of the biological and physical well-being of the protected areas. - Participates in the ecological, environmental and social assessment. - Contributes in analyzing the data on deforestation and fires - Participates in the coordination of the intersectoral relations
SGBDF	Management BDF	- Interface between GFW and the DGF on the BDF; - Participates in supplying the BDF - Contributes in analyzing the data on deforestation and fires - Contributes to the deforestation and fire warning system (dissemination of information).
DVRF	Control and monitoring of the TG and logging	- Coordinates and ensures the information on the TG and logging - Participates in the ecological, environmental and social assessment. - Contributes in analyzing the data on deforestation and fires
DREF	Decentralized technical office of forests	- Management of information at the regional level - Coordinates the activities of surveillance at the regional level - Participates in the ecological, environmental and social assessment. - Contributes in analyzing the data on deforestation and fires
COBA	Managers of the landscape	- Collection and submission of the data from the ecological, environmental and social monitoring. - Participates in the ecological, environmental and social assessment. - Implementation of the PAGS. - Surveillance of the management tools - Surveillance of transferred forest
ONE	Coordination of the national action plan for the Environment, Environmental impact assessments	- Coordinates intersectoral relations - Ensures legality of procedures (environmental impact assessments)

Institutions	Field of intervention	Inputs
MNP	Management of the Environmental Information Systems	<ul style="list-style-type: none"> - Manages the information on the PREE. - Manages the platform of information management - Participates in the development of forest information - Participates in the large scale dissemination of the information
	Management of protected areas	<ul style="list-style-type: none"> - Management of the information at PA level - Coordinates the activities of surveillance at PA level - Forest surveillance at PA level
NGO	Manager REDD Project (WWF-WCS-ETC TERRA – PHCF - CI)	<ul style="list-style-type: none"> - Collection and submission of the data from the ecological, environmental and social monitoring. - Participates in the ecological, environmental and social assessment. - Contributes in analyzing the data on deforestation and fires - Surveillance of the implementation of the management tools - Forest surveillance and control - Participatory assessment of the reduction of GHG emission.
	NAP Managers (CI – WWF - FANAMBY ...)	<ul style="list-style-type: none"> - Collection and submission of data from the ecological, environmental and social monitoring. - Participates in the ecological, environmental and social assessment. - Contributes in analyzing the data on deforestation and fires - Surveillance of the implementation of the management tools - Forest surveillance and control
Project	Promotion TG (CIRAD – Intercooperation - GIZ	<ul style="list-style-type: none"> - Collection and submission of data from the ecological, environmental and social monitoring. - Contributes in analyzing the data on deforestation and fires - Participates in the ecological, environmental and social assessment. - Surveillance of the implementation of the management tools - Forest surveillance and control
Decentralized territorial entity	Local administration	<ul style="list-style-type: none"> - Monitoring and control of the implementation of the management tools - Social mobilization

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