



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Naoko Ishii
CEO and Chairperson

July 02, 2015

Dear LDCF/SCCF Council Member,

IFAD as the Implementing Agency for the project entitled: ***Egypt: Integrated Management and Innovation in Rural Settlements*** has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with IFAD procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the LDCF/SCCF Council in October 2014 and the proposed project remains consistent with the Instrument and SCCF/GEF policies and procedures. The attached explanation prepared by IFAD satisfactorily details how Council's comments have been addressed.

We have today posted the proposed project document on the GEF website at www.TheGEF.org for your information. We would welcome any comments you may wish to provide by July 30, 2015 before I endorse the project. You may send your comments to gcoordination@TheGEF.org.

If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Naoko Ishii
Chief Executive Officer and Chairperson

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee



REQUEST FOR CEO ENDORSEMENT/APPROVAL

PROJECT TYPE: Full-sized Project
THE Special Climate Change Fund (SCCF)¹

PART I: PROJECT INFORMATION

Project Title: Integrated Management and Innovation in Rural Settlements in Egypt			
Country(ies):	Egypt	GEF Project ID: ²	6927
GEF Agency(ies):	IFAD	GEF Agency Project ID:	
Other Executing Partner(s):	Ministry of Agriculture and Land Reclamation (MALR)	Submission Date:	24 April 2015
GEF Focal Area (s):	Climate Change	Project Duration (Months)	84
Name of Parent Program (if applicable)		Project Agency Fee (\$):	742,140
<ul style="list-style-type: none"> ▪ For <input type="checkbox"/> SFM/REDD+ ▪ For SGP <input type="checkbox"/> ▪ For PPP <input type="checkbox"/> 			

A. FOCAL AREA STRATEGIC FRAMEWORK³

Focal Area Objectives	Expected FA Outcomes	Expected FA Indicators	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
CCA-1 (select)	Outcome 1.2: Livelihoods and sources of income of vulnerable populations diversified and strengthened	Indicator 3: Population benefiting from the adoption of diversified, climate-resilient livelihood options	SCCF	1,526,000	4,813,100
CCA-1 (select)	Outcome 1.3: Climate-resilient technologies and practices adopted and scaled up	Indicator 4: Extent of adoption of climate-resilient technologies/practices	SCCF	3,104,550	22,616,250
CCA-2 (select)	Outcome 2.2: Access to improved climate information and early-warning systems enhanced at regional, national, sub-national and local levels	Indicator 7: Number of people/geographical area with access to improved climate information services	SCCF	669,500	573,800
CCA-2 (select)	Outcome 2.3: Institutional and technical capacities and human skills strengthened to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures	Indicator 9: Number of people trained to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures	SCCF	1,868,450	8,171,050
CCA-3 (select)	Outcome 3.2: Policies, plans and associated processes developed and strengthened to identify, prioritize and integrate adaptation strategies and measures	Indicator 13: Sub-national plans and processes developed and strengthened to identify, prioritize and integrate adaptation strategies and measures	SCCF	271,500	-
Sub-Total				7,440,000	36,174,200
Project Management Cost ⁴			SCCF	372,000	1,958,400
Total Project Cost				7,812,000	38,132,600

¹ This template is for the use of LDCF projects and SCCF Adaptation projects only. For other SCCF projects under Technology Transfer, Sectors and Economic Diversification windows, other templates will be provided.

² Project ID number will be assigned by GEFSEC.

³ Refer to the Focal Area Results Framework and LDCF/SCCF Framework when completing Table A.

⁴ PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

B. PROJECT FRAMEWORK

Project Objective: to enhance farmland productivity and income diversification in the reclaimed lands through increasing by 40% the average incomes of 60% rural poor household engaged in livestock value chains, with 30% of the target smallholders participating actively in commercial farming and business development by the end of the project.								
Project Components	Indicate whether Investment, TA, or STA**	Expected Outcomes	Expected Outputs	LDCF/SCCF Financing*		Co-financing*		Total (\$)(*000)
				(\$)(*000)	%	(\$)(*000)	%	
1. An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands	TA	1.1: Climate change adaptation measures for agriculture production in reclaimed lands are mainstreamed into relevant policy frameworks and decision-making tools.	Relevant governmental staff is enabled to mainstream CC adaptation recommendations for the agriculture sector into policy documents and official reports responding to regional and global processes. An effective and sustainable Dynamic Agriculture Information and Response System (DAIRS) supports decision-making to mitigate climate risks in agriculture production in the reclaimed lands.	941.0	62.12	573.8	37.88	1,514.8
2. Optimized irrigation water management at the tertiary and on-farm levels	INV	2.1: Water users are enabled to design and implement optimal cropping patterns and climate-resilient irrigation plans 2.2: Investments in modernized water distribution and irrigation systems allow farmers' associations to make an optimized use of water	Optimized cropping patterns and irrigation plans are implemented by skilled farmers in the 4 target areas Cropping systems with efficient water use are implemented in the 4 target areas	3,597.6	13.12	23,414.1	86.88	27,011.7
3. Climate proofing of crop value chains and diversification of local livelihoods	TA	3.1: The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed	Individual farmers and members of CDAs and ACs are trained on climate-resilient value chain technologies Local farmers (50% women) are trained as extension providers to support FFS	2,901.4	19.23	12,186.3	80.77	15,087.7

		3.2: Beneficiaries have improved agriculture production and market competitiveness through investments in climate-resilient value chain technologies and diversification strategies.	At least 100 ACs and 200 women-led small enterprises report improved production, marketing and income diversification					
4. Project management				372.0	16.06	1,958.4	83.94	2,330.4
Total Project Costs				7,812.0		38,132.6		45,944.6

* List the \$ by project components. The percentage is the share of LDCF/SCCF and Co-financing respectively to the total amount for the component, ie. the percentage for each component will be added up horizontally to 100%.

** TA = Technical Assistance; STA = Scientific & technical analysis.

C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)

Source of Co-financing	Name of co-financier (source)	Type of Cofinancing	Cofinancing Amount (\$)
GEF Agency	IFAD	Grants	5,753,600
GEF Agency	IFAD	Soft-loan	32,379,000
Total Co-financing			38,132,600

D. LDCF/SCCF RESOURCES REQUESTED BY AGENCY(IES) OR COUNTRY(IES) *

GEF Agency	Fund Type	Country Name/ Global	(in \$)			
			Project Preparation	Project	Agency Fee	Total
Total Resources						

* No need to provide information for this table if it is a single country and single GEF Agency project.

E. PROJECT MANAGEMENT BUDGET/COST

Cost Items	Total Estimated person weeks (GEF funded)	GEF (\$)	Other sources (\$)	Project total (\$)
Local consultants*	336	300,000	978,500	1,278,500
International consultants*				
Office facilities, equipment, vehicles and communications**			592,500	592,500
Travel**				
Total		300,000	1,571,000	1,871,000

* Provide detailed information regarding the consultants in Annex C.

** Provide detailed information and justification for these line items.

F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Estimated person weeks	GEF (\$)	Other sources (\$)	Project total (\$)
Local consultants*	1400	1,063,050	1,743,300	2,806,350
International consultants*	256	323,500	445,300	768,800
Total		1,386,550	2,188,600	3,575,150

* Provide detailed information regarding the consultants in Annex C.

G. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? (SELECT)

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund)

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF⁵

A.1 National Strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

1. The Government of Egypt (GOE) has been pursuing this poverty reduction strategy through five main avenues: (a) economic growth for increasing income and employment through investment in productive sectors; (b) increasing the efficiency of the agriculture sector, particularly water and land utilization to enhance yields, income and food security for the poor, (c) human development of the poor for raising their capability through education, health, and local level organizations; (c) women's advancement and closing of gender gaps; (d) safety net measures for the poor, especially women, against anticipated and unanticipated income/consumption shocks through targeted and other efforts; and (e) participatory governance for enhancing the voice of the poor.
2. Agricultural policy in Egypt has gone through significant reforms since early 1990s. The Government has formulated a new *Sustainable Agriculture Development Strategy towards 2030* (SADS) in recognition of the fact that transformation of the agriculture sector is key for economic growth and development in Egypt. The objectives of the SADS towards 2030 are: (i) sustainable use of natural agriculture resources, (ii) increasing the productivity of both the land and water units; (iii) raising the degree of food security of the strategic food commodities; (iv) increasing the competitiveness of agriculture products in local and international markets; (v) improving the climate for agriculture investment; (vi) improving the living standards of the rural inhabitants, and reducing the poverty rates in the rural areas. Based on estimated population and agriculture growth rates, total agriculture investments needed for the achievement of the strategy objectives is estimated at about EGP 500 billion, with a projected annual growth rate of 4% until 2030.
3. The Government of Egypt acknowledges the importance and the potential of the horticultural sector. In this regard its agriculture strategy is focused on the enhancement of agriculture productivity in order to support competitiveness of agricultural products in the local and export markets. This will be achieved through a number of initiatives with focus on horticulture, particularly for crops requiring low water usage and/or with high potential for export. The Government is putting great emphasis on increasing the per capita consumption and modernizing its milk sector. The GOE also recognizes the main reasons why farm income in rural Upper Egypt is lower than it is in rural Lower Egypt. These are threefold: (a) agriculture in Upper Egypt is dominated by traditional low market-value crops and therefore generates less revenue per cropped area compared to Lower Egypt; (b) farmers in Upper Egypt are unable to finance the higher costs and greater risks of growing non-traditional crops; and (c) average farm holdings in Upper Egypt tend to be smaller than those in Lower Egypt. In addition, rural poverty is exacerbated by the lack of sufficient alternative employment opportunities.
4. The Government has established some alternative avenues for rural finance provision. With donor assistance, GOE has established the *Social Fund for Development* (SFD) and the *Agriculture Development Programme* (ADP)⁶. These provide financial services to rural areas and the agriculture sector through special directed credit lines. SFD is now a major player in the provision of micro-finance in the country and operates as a wholesaler of financial services through its Micro Finance and Small Enterprise windows. ADP is a fund owned by the Ministry of Agriculture and Land Reclamation (MALR) and managed by the Commercial International Bank on their behalf. It was created to consolidate the revolving credit fund provided to the Ministry in several European Union (EU) funded projects targeted at the agriculture sector. ADP operates through 12 affiliated commercial banks, which in turn, provide both individual and collective loans directly or through Agriculture Cooperatives and selected Associations. ADP has provided credit mainly to the small and medium sized enterprises⁷. Its added strength is that through its investment income, the ADP also provides technical assistance for research and development for the agriculture sector.

⁵ For questions A.1 – A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter “NA” after the respective question.

⁶ Formerly the Agriculture and Research Development Fund (ARDF).

⁷ About 80% of its financing is for SME financing.

5. The Ministry of Agriculture and Land Reclamation (MALR) and the Ministry of Water Resources and Irrigation (MWRI) have set an integrated plan for land reclamation through several mega projects targeting about 1.4 million hectares to be reclaimed by 2017. This plan considers two types of mechanisms to procure the required water resources for reclaiming the targeted areas. The first entails increasing the efficiency of the current agricultural water use, minimizing irrigation water losses, while the second entails increasing non-conventional water resources share in agriculture. This plan probably includes a set of steps towards the adaptation to CC and the improvement of the CC resilience of the smallholder farmers that are the most vulnerable to climate hazards.
6. The Egyptian Environmental Affairs Agency (EEAA) encourages the use of cleaner technologies through environmentally friendly industrial zones and processes aiming at increasing the efficiency of the use of resources, including reuse, recovery and recycling in order to reduce the amounts of waste generated from production activities. However, investment offices in governorates are still needed to facilitate private sector participation. EEAA signed a protocol with the Federation of the Egyptian Industry (FEI) to promote cooperation for environmental protection in Egypt. EEAA has submitted two national communication reports (first and second National Communications) to the UNFCCC, and the third one is currently underway.
7. Egypt was among the first Arab countries to join the cooperative global efforts to confront climate change. Since the Rio de Janeiro Earth Summit in 1992, it has ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and signed the Kyoto Protocol in 1999. Its First National Communication to the United Nations Framework Convention on Climate Change was published in 1999. The report pays extensive attention to the risks facing the country due to climate change and sea-level rise, mainly in relation to agriculture, water resources, human health, and the coastal zone (particularly the Nile Delta). It also includes economic loss estimates for sea level rise in several coastal cities. Moreover, a large range of adaptation options are identified, most of them “no-regrets”. The report however appears to be weaker in terms of the implementation arrangements for the adaptation options
8. To cope with CC risks at a national level, the Ministry of Water Resources & Irrigation (MWRI) has adopted in 2013 a national strategy of adaptation to CC. However, there has not been neither a thorough consultation process with the various partners nor a potential approval of the strategy. In addition to this national strategy, there are some strategic reflections at the sectoral level such as: (i) the “Egypt’s gender and CC national strategy” developed by CEDARE in collaboration with the International Union for Conservation of Nature (IUCN); (ii) the Participatory Development Programme (PDP)/CC Adaptation and Resilience in Informal Urban Area, led by The German Cooperation Agency (GIZ).
9. For on-farm irrigation systems in Egypt, figuring out adaptation strategies is a high national priority. The current national plan for improving on-farm water management is an ambitious plan targeting 2 million ha in 10 years. The implemented plan will increase irrigation efficiency by 50 to 75%, which is equivalent to water needs for reclaiming about 1.21 million ha.
10. Regarding the improvement of coastal resources management planning and protection against impacts of CC, the Egyptian National Assembly (ENA) has recently approved new regulations to include Integrated Coastal Zone Management (ICZM) into developmental plans. This makes it necessary to have a strong institutional monitoring capability. In fact, the mainstreaming of CC in the strategic planning process development (national and sectoral) is limited and not meaningful. In this respect, there are some interesting initiatives to mainstreaming CC which should be supported in order to achieve more structured and systematic mainstreaming methodological approach.
11. On the other hand, Egypt ratified Kyoto protocol on 12/1/2005 followed by establishing the Egyptian Designated National Authority for Clean Development Mechanism “DNA-CDM”. Investment costs of initially approved 55 projects in 2009 are USD 1243 million. These projects will reduce GHG by almost 8.3 Million ton CO₂ equivalent. They include reduction of nitrous oxide emission from fertilizer industry, renewable energy, fuel switching, methane capture and flaring from waste and energy efficiency improvement.

A.2 Consistency of the project with LDCF/SCCF eligibility criteria and priorities.

12. The project has been developed in conformity with the SCCF eligibility criteria. The project proposal respects the principle of country ownership having been developed in consultation with national stakeholders, as well as by taking into account all the latest and relevant studies and reports available on climate change adaptation in Egypt. In addition, the project has been designed to fully address the priority activities identified by the Government of Egypt in the SNC, CCAPF, National

Strategy for Adaptation to CC and DRR, SADS, and it has been developed with the aim of ensuring sustainability and replicability beyond project completion. The project design criteria have been respected by including a list and description of the project components as well as by describing the added value of the GEF intervention (additionality). The GEF component will build directly on past and ongoing investment projects from IFAD and other agencies, and it will complement activities and achievements in light of the expected impact of climate change. Co-financing requirements are satisfied and cost-effectiveness aspects have been carefully considered. The project will be mainly investment-oriented and aims at encouraging replication and scaling-up at national level. The GEF and SCCF criteria for project design and financing have been respected: project management costs represent less than 10% of the total budget requested and co-financing ratio fulfils SCCF criteria.

13. The SCCF project follows the approach of country ownership and a focus on results, supporting investments that reflect governmental priorities for poverty reduction and climate change adaptation in agriculture. These investments seek to increase agriculture resilience to CC risks, boost rural income by improving agriculture productivity and access to markets, and enhance food security by expanding local food supply and creating new income opportunities.
14. The project has been proposed by Government and it is fully aligned with the COSOP's three strategic objectives, namely: (i) Improve the access of poor rural farmers to better quality services; (ii) Enhance the pro-poor sustainable use of natural resources, and; (iii) Strengthen the skills and organizational capacity of poor rural men and women to take advantage of rural on- and off-farm economic opportunities. The proposed project design was developed in close coordination with the Ministry of International Cooperation (MOIC) and the Ministry of Agriculture and Land Reclamation (MALR). The project supports the GOE's policy of integrated community development on the new lands, is aligned with the Government's Poverty Reduction Action Plan, its Sustainable Agriculture Development Strategy towards 2030 and its Water Resources Management Strategy (2009-2017), and responds to the priority measures for CC adaptation proposed in the SNC, the National Strategy for Adaptation to CC and DRR, CCAPF, and SADS.

A.3 The GEF Agency's comparative advantage

15. Environmental threats such as climate change are inseparable from IFAD's mission of helping poor smallholders. Climate change is multiplying the existing risks of IFAD's target group and IFAD is keen of turning these into opportunities. IFAD, through the implementation of its climate change strategy, is maximizing its impact on rural poverty in a changing climate. IFAD has been successful in doing so through supporting innovative approaches to helping smallholder producers – both women and men – build their resilience to climate change; helping smallholder farmers take advantage of available adaptation incentives and funding; informing a more coherent dialogue on climate change, rural development, agriculture and food security, as well as influencing relevant policies. Moreover, IFAD brings a good knowledge of natural resource management and a significant pool of knowledge and experience in capacity building and the empowerment and sustainable agricultural production. The Fund's comparative advantage also lies in its ability to work at the grassroots, community level.
16. IFAD is a small donor in Egypt in terms of the volume of financial assistance it provides compared to others. However, its assistance is highly valued by the GOE and has been targeted very strategically to the agriculture sector and the smallholder farmer in particular. The organization has committed almost US\$322.73 million in loans to Egypt since 1981 to support agricultural development and reduce rural poverty, benefiting about 1.3 million poor rural households or 7 million people and covered 447,000 feddan (188,000 ha). In total, IFAD has invested in 11 agricultural development programs and projects designed in collaboration with smallholders, the government and other partners in Egypt. Eight of the projects have been completed, and three are ongoing. These investment support activities are aimed at improving the incomes and living conditions of small-scale farmers and their communities, and influencing public policy on land tenure and other land settlement systems.
17. The current result-based country strategic opportunities programme (RB-COSOP) covers the period 2011-2015. Its strategic objectives are aligned with the Government's Agricultural Sustainable Development Strategy 2030, developed in collaboration with IFAD. They are also aligned with the IFAD Strategic Framework 2011-2015. The country strategy is the outcome of a participatory process of consultation with key stakeholders, including government institutions, civil society, the private sector and donors. The two pipeline projects identified reflect government investment priorities in water-use efficiency and market linkage.
18. IFAD's comparative advantage lies in continuing to work closely for and with smallholder farmers and their organizations, small rural entrepreneurs and rural women. The development goal of the RB-

COSOP is to contribute to the reduction of rural poverty and the enhancement of national food security in Egypt. This goal will be pursued through three strategic objectives. Gender equity and environmental sustainability will be pursued as crosscutting themes in the overall programme.

A.4 the baseline project and the problem that it seeks to address

Baseline project

19. The project "Integrated Management and Innovation in Rural Settlements in Egypt" has been designed as a component of the baseline "Support for small-scale farmers settling on reclaimed land in Egypt aids agricultural productivity and incomes" (SAIL), a new US\$86.8 million project that will help small-scale farming families who have settled on reclaimed land increase their incomes by strengthening their farmer organizations and building their capacity to connect to local and international markets.
20. A key sector in the Egyptian economy, agriculture provides a living for 55 per cent of the population, and directly employs about 30 per cent of the labor force. One of the greatest constraints hindering agricultural growth in Egypt is the limited availability of irrigated land in a country that receives hardly any rainfall. The situation is not likely to improve as climate change and population growth combine to increase pressure on limited natural resources. In addition, there is a critical need in Egypt to develop new lands to attract people away from overcrowded cities and regions. For decades, the government has been reclaiming desert land for agriculture while trying to create viable agricultural communities.
21. Building on the success of previous IFAD-supported work on land reclamation in the country, the new project will continue to work with small-scale farming families and unemployed youth to develop and promote their access to finance and markets, as well as improving their livelihood. The project is expected to reach some 280,000 people in 30 new settlements across Egypt. In addition to the continued development of irrigation systems, the project will work to improve agricultural practices and value chains over an area of 41,147 hectares of farmland.
22. The development goal of SAIL is to contribute to the reduction of poverty and increase food and nutrition security for poor rural women and men in Egypt. The development objective of the project is to enable smallholder farmers to enhance their incomes, increase profitability and diversify their livelihoods. The expected outcome of the project will be (i) strengthening smallholder institutions; (ii) improved agriculture production and marketing; (iii) improved capacity for employment and enterprise development.
23. The SAIL project will include three main components; (i) Community and Livelihood Development; (ii) Agriculture Production and Diversification; (iii) Financial Services Component, and (iv) Project Management. These components are designed to work in an integrated manner to provide the essential inputs and services, which a community needs for its proper rehabilitation, intensive agriculture production and diversifying livelihoods. The total project cost of \$86.8 million is made up of an IFAD loan of \$63.2 million, an IFAD grant of \$6.4 million, and \$15.2 million from the government of Egypt. An additional \$2 million of co-financing will come from the rural women and men benefitting from the project.
24. The SCCF project is fully embedded in the SAIL baseline project in a synergetic fashion that will ensure that GEF funding covers additional costs associated with CC adaptation needs, in line with the governmental priorities on climate change. The planned duration of the project is 7 years starting in late 2015. The proposed project will assist the baseline SAIL supported households to increase agriculture profitability in the reclaimed lands, to select optimal cropping patterns with more water efficient crop types and varieties, and to make an optimal use of natural resources – water, soil, plant and animal species, renewable energy - to adapt the farming systems to CC predictions, ensure sustainability in natural resources management, and achieve the maximum net return per unit of water. This will be done by diversifying crop and livestock production, absorbing landless labor and youth, and creating opportunities for productive employment for women and contribute to poverty reduction, food security and gender equity.

Project rationale

25. Agriculture represents one of the most complex and important human activities in Egypt and it plays a significant role in the Egyptian economy. It is not only important in terms of national income, but is also vital in terms of employment, food and nutrition security and reduction of poverty in Egypt. Moreover, agriculture plays an important role in the social structures of rural areas in Egypt, and it is

responsible for social stability in these regions. Egypt enjoys a significant comparative advantage in the production and export of high value horticulture products including herbs and medicinal plants. This comparative advantage is based on its favourable agro-climatic conditions, off-seasonal production capabilities and physical proximity to important markets like the Gulf countries and EU countries.

26. There is a close interrelationship between growth in agriculture and poverty reduction in Egypt. Growth in the agriculture sector can reduce poverty as well as stimulate growth in the rural non-farm sector as farm income can drive demand for the large, employment-intensive, non-tradable, rural non-farm sector. The extra job creation allows underemployed labor to be absorbed or real wages to rise with a concomitant and rapid decrease in poverty.
27. There is a critical need in Egypt to expand new areas of growth and settlement to attract people from the overcrowded old lands and provide them an opportunity for productive growth and diversification of livelihoods. Land reclamation has been pursued as an important strategy for growth and development since the 1950s by successive governments and has been adopted to achieve four policy objectives: (1) enhance agricultural production – the historical motive for reclamation; (2) decrease population growth in the Nile Valley and the delta; (3) generate employment; and (4) alleviate poverty. In the new lands, the Government provides settlers with land at nominal cost (which they can pay over thirty years and obtain title) and rudimentary housing facilities. More recently the land has been given to unemployed graduates and smallholders displaced from old lands for various reasons.
28. Egypt is located in the arid region and will be greatly affected by the adverse effects of climate change. Climate change will exacerbate the anthropogenic threats affecting agriculture production, namely the inefficient use of natural resources contributing to over-irrigation and salinity problems, the production losses due to lack of post-harvesting and marketing facilities, and the rapid population growth with higher pressure to convert agriculture land into urban areas which conflicts with the higher agriculture production needs.
29. According to the SNC (2010), climate change will most likely hit the rural communities severely due to their fragile socioeconomic conditions, their dependence on irrigated crops, a climate that is already too dry to support cropping systems, and the increasing water demands. The vast majority of crops in Egypt are irrigated from Nile water creating great vulnerability to reductions in the river flow. Furthermore, producing farmland in the Nile Delta faces the threat of inundation and salinisation due to sea level rise of 12% to 15% of the most fertile arable land. Climate change also increases crop evapotranspiration with an effect in yield reduction, which is predicted to decrease up to 20% (e.g. barley, wheat, maize)⁸. It will reduce the production of livestock and affect the productive potential of many agricultural zones in the country. The projected increase in temperature is expected to widen the gap between water resources and demands, decrease the overall agriculture productivity, and increase competition over natural resources. Analysts expect a 7% increase in irrigation demand by 2060, with the additional need to improve water efficiency in irrigation up to 75%. Crop water requirements of the important strategic crops are expected to increase by a range of 6% to 16% by 2100. The high vulnerability of on-farm irrigation systems in Egypt is attributed to low efficacy and irrigation management patterns. Vulnerability of crops to changes in pest infestation and plant diseases is another potential impact of climate variability in the Country⁹.
30. Based on the success of the West Noubaria Rural Development Project (WNRDP), the GOE has requested IFAD for assistance in mainstreaming climate change adaptation in agriculture development in the reclaimed lands, through institutional development and capacity building to help all concerned actors - from the national to the local level – incorporate adaptation and climate risk reduction into decision-making and operations, as well as through innovative investments and the provision of services to help farmers shift from maladaptive rural development practices into climate-resilient crop and livestock value chains.
31. The proposed project will assist the baseline SAIL supported households to increase agriculture profitability in the reclaimed lands, to select optimal cropping patterns with more water efficient crop types and varieties, and to make an optimal use of natural resources – water, soil, plant and animal species, renewable energy - to adapt the farming systems to CC predictions, ensure sustainability in natural resources management, and achieve the maximum net return per unit of water. This will be done by diversifying crop and livestock production, absorbing landless labor and youth, and creating

⁸ Sustainable Agricultural Development Strategy Towards 2030. Ministry of Agriculture and Land Reclamation, Arab Republic of Egypt, October 2009.

⁹ Egyptian Environmental Affairs Agency, 2014.

opportunities for productive employment for women and contribute to poverty reduction, food security and gender equity.

32. Enhanced resilience to climate change will hence have close resonance with responding to water scarcity, increasing land productivity and livelihood diversification. Adaptation measures on the supply-side include ways to improve irrigation techniques and know-how, introduction of tolerant varieties, introduction of renewable energy alternatives, as well as improving post-harvest facilities. In addition, investments in improved climate-risk reduction and long-term forecasting of climate extreme events impacting agriculture and livestock production is essential to enhance Egypt's ability to cope with prolonged heat waves and other climate change related hazards¹⁰. The proposed project will make investments that address some of these issues to reduce the vulnerability of target communities to climate change, including a Dynamic Agriculture Information and Response System (DAIRS).
33. Many of the irrigation channels, drainage structures and pumping stations are functioning at low capacity due to poor maintenance. The SCCF project will support the adoption of renewable energy equipment as an additionality to the baseline SAIL support for rehabilitating the irrigation and drainage systems, fix the broken pumps in close collaboration and participation of water user groups, etc. Prior to these investments, the project will work with the Agriculture Cooperatives in establishing the WUGs, train their members in proper operation and maintenance arrangements including establishing of a mechanism for collection of funds, for purchase of any materials and payment to guards, maintenance staff, etc.
34. Given the CC projections about available water reduction and higher irrigation demand, the project will also capitalize upon the opportunity of introducing innovative water and energy efficient technologies. The project will scale up the successful experience of WNRDP in which farmers were given access to credit for the introduction of efficient irrigation systems (studies in West Noubaria have demonstrated a reduction by 38 to 50% of the water consumption by shifting from flood to drip irrigation depending of the crops). This will help in increasing the efficiency of water use, increase area under irrigation and make the distribution of water more equitable. The introduction of more efficient irrigation systems such as drip irrigation significantly reduces the quantities of water used by the farmers, and reduces salinisation problems. To help reduce energy costs, the project will introduce solar energy pumps, solar panels for lighting among groups of farmers and introduce biogas technology. Empirical studies of the agriculture sector confirm that the enhanced utilization of new agricultural technology can play a crucial role in increasing total factor productivity, increasing labor and agricultural wages.
35. The project will make important investments in strengthening the baseline SAIL effort to increase the farmer's capacity to improve crop and livestock productivity through the piloting and dissemination of a number of adaptive agronomic systems and technologies, as well as crop types/varieties and livestock breeds. The project will build on a number of successful experiences on conservation agriculture, efficient irrigation systems, organic farming, soil-less hydroponic production, etc, implemented by IFAD and other partners in the reclaimed lands of Egypt, and in some neighboring countries.
36. Various donor-funded programs, including WNRDP, have proved that Agriculture Cooperatives (ACs) can be organized and trained to better manage irrigation infrastructure, farm equipment and undertake collective marketing activities. Agriculture Cooperatives can group to form Marketing Associations (MAs) with the capacity to engage in accessing better price for their produce through collective marketing by meeting Global-GAP and organic certification requirements. Besides they can become service providers for their members and exercise peer pressure among members to foster compliance with agreements, production practices and delivery schedules. In recognition of this fact, the Government has given considerable importance to establishing small producer organizations in its new Agriculture Strategy (SADS). The baseline SAIL project will provide significant support to ACs development that will integrate CC adaptation into decision-making and value chain development and investments – from production to post-harvesting, processing, product diversification and marketing – through the SCCF interventions.
37. The project will put in place participatory decision-making systems for CC adaptation planning and demand driven processes for building the adaptive capacity and strengthening all concerned actors, institutions and organizations. The proposed project will build on the successful experience of the WNRDP project in establishing and strengthening rural institutions especially Community Development Associations (CDAs), Agriculture Cooperatives and within them Water User Groups (WUGs) and FMAs. There is also need to improve the corporate governance of these rural institutions,

¹⁰ FAO, 2014.

strengthen their leadership, enhance transparency, and accountability. Investment in these rural institutions is instrumental given that the Government is planning to reform the agriculture cooperative law which will give them much greater flexibility to function as independent, farmer owned, profit-oriented organizations.

38. The project will focus in particular on women CDAs who are virtually excluded from the Agriculture Cooperatives, and youth who lack any type of institutional membership. The CDAs will be responsible for management of services such as literacy classes, basic health services, initiation of savings groups and provision of loans in areas where these services are missing and also engage the more enterprising youth in innovative opportunities for economic and social enterprise. The WUGs and MAS will be formed from within the Agriculture Cooperatives to assist in the operation and maintenance of irrigation infrastructure and engage in collective marketing in collaboration with the private sector. The experience of WNRDP with strengthening water users and market associations and helping farmers with contract farming with the private sector will be scaled up.
39. The project will capitalize upon the experience of some on-going regional grants to provide additional technical assistance and services to the target group in the newly settled lands. The proposed project will disseminate the research results financed through some regional grants to ICARDA¹¹ to demonstrate the experience with changing crop rotations for enhanced agriculture productivity to increase farmers' income, decrease soil degradation, build soil fertility and sustain crop production. The project will also use the results from an IFAD research grant to CLAC to test CC adaptation agronomic systems and technologies to enhance the adaptive capacity of rural communities to climate change¹². The project will also capitalize on the investments made by previous and on-going IFAD projects. The project will include, as an important resource, the farmer market associations established by the WNRDP and learn from the experience of the Upper Egypt Rural Development Project (UERDP) and the On-Farm Irrigation Development on Old Lands Projects (OFIDO) through country level workshops and exchange visits. The Promotion of Rural Incomes through Market Enhancement Project (PRIME) has only recently been initiated. Where opportunities exist for leveraging some of the financial resources from this project through SFD or ADP, this will be capitalized upon to provide additional financing resources to smallholders on the new lands.

A.5 Incremental/Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project.

40. The SCCF intervention will be a blended project, fully integrated into the IFAD-supported baseline project SAIL, and will help mainstream a climate-resilient approach into the IFAD baseline interventions. IFAD's unique and incremental contribution to the agriculture and off-farm sector through this project will be a clear focus on its six principles of engagement. IFAD's focus on targeting will ensure that the poor rural people who have the capacity to take advantage of the economic opportunities provided by the new project include women, vulnerable households and unemployed youth. This focus is sometimes overlooked during implementation even if it is included in design. The project is especially designed to empower poor rural people in new lands, and will assist them in building their individual assets, knowledge, skills, collective organizations and assist women and youth as well as assist their organizations develop their skills and knowledge required to engage with markets. The project will be innovative in its strengthening of rural institutions, modern technologies, provision of marketing linkages and rural financial services. The project expects to catalyze effective partnerships between the smallholder farmers and the private sector and financial institutions.
41. The SCCF intervention will also incorporate climate-resilience into capacity development for public extension agents and organizations, and for the aggregation of project beneficiaries in environmentally sound and economically viable farmers' organizations. The approach to technology transfer and promotion will be through a combination of participatory planning of adaptation needs and options, demonstrations, training and exchange events, and systematic assessment and provision of services requested by farmers.
42. The incremental value of the GEF/SCCF funding will substantially expand the scope of SAIL investments. Project demonstration actions will become models for replication and upscaling in the

¹¹ Improving Livelihoods of Rural Communities in the Nile Valley and Sub-Saharan Africa Region: Sustainable Crop and Livestock Management".

¹² Improving smallholder farmer livelihoods in Sub-Saharan Africa Region through transforming research outcomes to create commercial opportunities. Options.

agriculture areas that will benefit SAIL investments beyond the project life (over the next 10-15 years).

43. The table below summarizes the added value of the GEF intervention in comparison to the baseline:

Baseline components and “with”/“Without” GEF interventions

SAIL Baseline Components	Without GEF Intervention	With GEF Intervention
Component 1: Strengthened Smallholder Institutions	<ul style="list-style-type: none"> • 30 CDAs and 20 youth CDAs established and trained. • 99 Social infrastructure facilities rehabilitated/constructed (e.g. drinking water, clinics, schools, nurseries, youth centres, solid waste management and solar lighting). • 42 ACs and 5 FMAs formed and trained 	<ul style="list-style-type: none"> • 24,000 producers are trained on CC adaptation agronomic systems and technologies; • The members of at least 50 CDAs and CAs are trained on climate-resilient VC technologies; • 40 farmers (50% women) are trained as providers of services to support FFS and provide extension services to local farmers. • 4,200 members of WUGs are trained on optimal cropping patterns and efficient irrigation plans from selected VCs.
Component 2: Improved agriculture production and marketing reported by at least 24,000 smallholder farmers	<ul style="list-style-type: none"> • 17 pumps on lifting stations rehabilitated reaching 11,067 households (HH) and benefiting 29,026 feddans. • 50,000 meters of mesqas constructed and drainage system improved covering 4,800 HH and 6,185 feddans. • Drainage improved for 10,134 feddans benefiting 3,839 HH. 	<ul style="list-style-type: none"> • Irrigation schemes become climate-proof thanks to the adoption of solar water pumps and other modern technologies. • 7,000 feddans are irrigated with efficient micro-pressurized irrigation technologies. • 24,000 HH have access to climate-proof irrigation systems and technologies. • 22 hydroponic and aquaponic pilot farms are established. • 60% beneficiaries report improved production and marketing based on climate resilient technologies. • An early warning system (DAIRS) and weather stations are installed to monitor climate-risks.
Component 3: Improved employment and enterprises development	<ul style="list-style-type: none"> • 2000 people received vocational, income generation and enterprise training. • 12,000 smallholders (5,000 women) access agriculture loans for livestock and agriculture production and marketing. 	<ul style="list-style-type: none"> • 100 ACS access grants for climate-resilient production, processing and diversification. • 200 women-led small enterprises access funding for climate-resilient income diversification opportunities.

Expected Adaptation Benefits:

44. The GEF project represents an opportunity to increase the scope of the poverty reduction and food security objectives pursued through the IFAD SAIL baseline project in light of the predicted negative impacts of climate change on agriculture and livestock production in Egypt. The GEF financing will aim at increasing the climate resilience of agriculture and livestock value chains in the reclaimed lands through the introduction of renewable energies in the water pumping systems and the post-harvesting and processing equipment, the adoption of efficient irrigation technologies, the piloting of soil-less hydroponic and aquaponic technologies, the recycling and use of waste through composting and bio-gas technologies, and the promotion of climate-resilient agronomic systems, cropping patterns, livestock breeds and crop types and varieties. The GEF project will invest significant effort in enhancing the adaptive capacity of all concerned institutions, organization and actors, from the ministerial level, to the local beneficiaries and other value chain actors, with special emphasis on the women population, benefiting a total of 40,000 households in 30 villages of 5 Governorates.
45. An estimate of the adaptation benefits produced by the GEF project interventions is the following: (i) by the end of the project, at least 60% of the target farmers will report yield increases between 25%-40% and at least 40% income increases from climate-resilient value chains; (ii) 24,000 HH will be trained in climate-resilient irrigation and agronomic systems, and 4,200 members of WUGs will be trained in the efficient management of irrigation water; (iii) the efficiency of the water irrigation systems will increase by at least 80%, with water savings between 35% and 50% in the use of water to irrigate crops in 7,000 feddans; (iv) soil-less hydroponic and aquaponic farms will be piloted and operational; (v) 100 agriculture cooperatives will have accessed grants for climate-resilient value chains and 200 women-led small enterprises will have accessed grants for income diversification based on climate-resilient development activities.
46. The project adaptation benefits will also have a national-wide impact at the policy level, through: (i) the training of at least 20 staff members from MALR, EEAA, EMA, CLAC, CCICRE on CC downscaling

methodologies applicable to the agriculture and livestock sectors; (ii) the production of relevant policy documents mainstreaming CC adaptation in the agriculture sector (e.g. the CC Adaptation Technical Needs Assessment; the CC adaptation strategy for agriculture development in the reclaimed lands); (iii) and the support to MALR for the development of a Dynamic Agriculture Information and Response System (DAIRS) at the national level, to facilitate early warning access to critical information about climate-related risks through media information and communication technologies (MICT) such as SMS message services to support decision-making by farmers and other practitioners in the effective planning, preparedness and response to climate-related risks affecting agriculture and livestock production.

47. The institutional development and training of at least 50 CDAs and ACs on CC adaptation systems and technologies for agriculture and livestock VCs will enable farmers' organizations, especially women and youth associations, with responsibility for operation and maintenance of water harvesting equipment and infrastructures, for the marketing of diversified agriculture and livestock products based on climate-proof technologies, including solar energy equipment.

Expected adaptation benefits from SCCF activities

SCCF Activity	Expected Adaptation Benefit
Optimized irrigation water management at the tertiary and on-farm levels	<ul style="list-style-type: none"> • Improved water distribution, increased water availability in the reclaimed lands, reduced water losses, increased water use efficiency by 80%, and 35% to 50% water saving in irrigated crops; • Reduced water demand and fertilizer application, reduced water evaporation losses (as evaporation increases at higher temperatures), increased crop yield and quality. Also, conditions may be less favorable for the onset of diseases, including fungus. • 80% to 90% reduction in the use of water in soil-less farming systems. Improves livelihoods of farmers where the land has lost productivity, provides nutrients for the crops from production of fish. The productivity of the crops thus is faster and better and provides nutritional security. • The introduction of solar pumps will generate environmental benefits through a decrease in fuel consumption and thus CO₂ released. This can be economically quantified using the CO₂ price on the voluntary market (around USD 7/ton). The related benefits at full project development are USD 78,000 per year. The financial benefit on the household's budget with the reduction of fuel expenditures is included in the crop models through lower irrigation costs. • Reduced energy costs and GHG emissions from fuel pumps by shifting to solar pumping equipment.
The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed	<ul style="list-style-type: none"> • Increases between 35% and 50% of crops yields; • Soil erosion reduction by 60-90% in the intervention areas; • The GEF project will scale up the WNRDP composting unit experience. Composting has a high contribution to carbon sequestration and improving the soil fertility in many ways. Compost for instance, is able to reduce erosion and nitrate leaching due to the increase in soil aggregate stability and water holding capacity of farm-land. Even degraded soils can be restored with the aid of compost. With its content of plant nutrients such as nitrogen, phosphorus and potassium, compost is a valuable fertilizer due to its suppressive effect on plant pathogens and has the capacity to control plant diseases. All these features account for the high rating of composting projects for the land resource criterion and are particularly important for agriculture in developing countries where crop inputs such as chemical fertilizers and pesticides are not readily available or hazardous to use without proper training. Flexi-biogas units provide locally accessible renewable energy for households, Reduces solid waste and creates organic fertilizer for improved soil fertility and sustained productivity, and reduces chronic pulmonary diseases by replacing the burning of wood with biogas. • Reduced workload of women as a result of innovative technologies and improved farming systems, with more time available for education, training, and the development of small businesses.

Income diversification through a mixed economy based on livestock-cropping production and marketing	<ul style="list-style-type: none"> • Generation of jobs and a range of auxiliary business in the crop value chains, with special focus on women and youth. • The members of at least 50 CDA and ACs are trained on climate-resilient VC technologies. • 24,000 practitioners have improved production and marketing based on climate-resilient technologies. • 100 agriculture cooperatives access grants for climate-resilient production, processing and diversification equipment. • 200 women-led small-enterprises access grant funding for climate-resilient income diversification opportunities.
An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands	<ul style="list-style-type: none"> • At least 20 staff members from relevant governmental institutions and departments have acquired knowledge on CC issues and methodologies. • Relevant policy documents on CC and agriculture are prepared, and concerned policy frameworks have mainstreamed CC adaptation in the reclaimed lands. • A Dynamic Agriculture Information and Response System (DAIRS) to support farmers in effective planning and preparedness to overcome climate-related risks is operational at the national level.
Gender and youth inclusiveness	<ul style="list-style-type: none"> • Minimum quotas established to ensure participation of women (at least 50%) and youth (at least 40% men and women younger than 30 years). • GEF & baseline project staff and service providers trained on gender and CC issues; service providers with proven capacity to work with women, including the use of female facilitators; • The project will organize groups of producers, with emphasis on women/youth groups. Females would be targeted through women and rural development structures as these institutions facilitate independent access to land, farm equipment, credit and training for their members. • The project will develop strategic partnerships with national youth and women associations to strengthen their capacity on CC adaptation issues.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objective(s) from being achieved and outline risk mitigation measures

48. The main potential risks threatening the SCCF intervention can be grouped under the following categories:

- A policy environment not amenable to enhancement and limited coordination among institutions;
- Significant civil unrest and natural disasters in the project area;
- The complexity of the chosen approach;
- Risks stemming from social norms and existing behaviours, and low level of buy-in from the final beneficiaries.

Risks and proposed mitigation measures

Risk	Rating	Proposed Mitigation Measures
Policy and institutional risks: coordination among national institutions is often problematic and their capacities are limited.	Medium	The intervention will contribute to addressing these issues through a sustained capacity building/development and engagement effort. Policy dialogue will give priority to emphasize the criticality of increased commitment to increase strategic planning and climate proofing the value chains to decrease climate change vulnerability, increase productivity, generate revenues, and contribute to food security.
Temporary Social unrest risk related to the current economic crisis and lack of working opportunities.	Medium	This risk will be mitigated through a coherent and continuous participatory approach ensuring full permeability between communities and institutions. The approach will therefore allow communities to be at the centre of their development ensuring arable

		land and job opportunities.
The ability of the existing institutional and policy/legal context to drive a successful wider implementation of the up-scaling efforts that the project is aiming at.	Low	This risk will be mitigated by putting significant efforts to create an enabling environment for mainstreaming and up-scaling the introduced innovations to value-chain development and planning. The successful examples at the national level and beyond will be built upon. The private sector and policy makers will be targeted in awareness campaigns and involved in the planning of investment choices in order to ensure a buy-in at all levels. The creation of businesses will ensure sustained contribution to food security
Complexity of the chosen approach: the participatory development approach that drives the intervention is highly dependent on the quality of the staff deployed in the field teams, the provision of adequate incentives and the participation of women in the process. Cultural traditions may prejudice the project's attempts to give women a greater voice.	Medium	The intervention will build on effective and efficient project management units established during the previous IFAD projects. The trust and relationships built with communities in the target would increase the likelihood of success in achieving the project' objectives. The approach of seeking win-win situations with investments that can clearly benefit all concerned users will be an incentive for dialogue and conflict resolution among different segments of the rural communities.
Elite capture by large commercial farms existing in the vicinity of the project area.	Medium	The best way to protect against this risk that the smallholders may sell out their land to other more profitable farmers is to make the smallholders profitable and sustainable enterprises, which is the main purpose of the project.
The project fails to capture the interest of final users at the community level.	Low	Key strategies such as awareness raising, the institutional development, training and technical support of CDAs and ACs, the training of trainers programme supporting community members – women and men – to become facilitators and providers of extension support to the project beneficiaries, and a soild learning by doing (FFS) capacity building programme, coupled with ensuring that economic incentives are well developed.
The project fails to expand women's access to and control over fundamental assets.	Low	The Project is specifically targeting women groups to enhance their access to capital, physical assets, support services and knowledge. The project will therefore ensure the highest participation of women and women organizations in order to ensure the most accurate representation of all gender needs and its perception of needs to be addressed.

A.7 Coordination with other relevant/GEF financed initiatives

49. IFAD will coordinate with all UN agencies wherever possible, and attempt to partner particularly with UNIDO and other government and non-government institutions in identifying and deploying innovative technologies and solutions. Partnerships with regional donors including the World Bank, the African Development Bank (IsDB) and Arab Funds are being nurtured and will benefit from IFAD's framework for cooperation with IsDB for project financing. The project will coordinate with active EU and other bilateral donors active in the sector and areas of intervention ensuring as well distribution of the collected data through the appropriate research institute.
50. The GEF intervention will complement other relevant GEF-financed initiatives in Egypt such as UNIDO/"Promoting Low-carbon Technologies for Cooling and Heating in Industrial Applications in Egypt" and UNDP/"Grid-Connected Small-Scale Photovoltaic Systems in order to ensure the use of the most advanced technologies in Agriculture" (i.e. water pumping, post harvest techniques, storage

rooms). Additionally the project will ensure coordination and synergy with UNESCO, UNDP13, WFP14, GIZ15 and UNEP16 in sharing all lessons, experiences and produced data necessary to enhance and consolidate the regional Climate Change forecast models.

51. Collaboration will be sought with other institutions and UN agencies, mainly UNIDO, in identifying and deploying innovative technologies and solutions, as well as capturing successful experiences that could benefit the target communities.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE

B.1 Describe how the stakeholders will be engaged in project implementation.

Project Implementation Arrangements

Project coordination and supervision

52. IFAD will be responsible for the coordination and supervision of SCCF, in accordance with GEF standards and procedures. Supervision and implementation support will be a continuous process, involving ongoing communication and engagement with MALR, the project team, the managers of the baseline project, and other relevant stakeholders.
53. At inception, IFAD will review and update the Logical Framework of the project during a SCCF start-up workshop with the participation of representatives from all stakeholder groups, prepare the Overall Work Plan & Budget and fine-tune the first Annual Work Plan & Budget (AWPB), and prepare a supervision plan for the project's first 12-18 months. Thereafter, the project team will prepare each year a consolidated AWPB incorporating the five State AWPBs generated by SIUs for review and approval by the PSC, to be submitted in advance of the GoS annual budgeting process to ensure that sufficient counterpart funds are made available,
54. The project will be directly supervised by IFAD. The approach to supervision will be one of implementation support and assistance. Given that the project is dispersed in different regions of the country and it might not be feasible to visit each area every time, several special features are proposed in the supervision arrangements. The first of these is to have, on ground, a local rural finance specialist who will provide guidance to the project on an on-going basis and assist in removing any implementation bottlenecks in discussions with the various implementing partners under this component. This is all the more important given that rural finance is a major component of the project and that in the past rural finance components have been slow to disburse because of lack of on-ground support and discussions with the implementing agencies in a timely manner to identify the constraints and propose solutions.
55. The second approach, used cost-effectively, in some countries, is to adopt a country programme approach to supervision and field technical specialists to the country who will supervise certain elements common to all on-going projects such as gender and poverty targeting, participation of youth, monitoring and evaluation, financial management and strengthening of rural institutions, etc. In addition, a supervision mission will be fielded after every six months in the initial period and thereafter every year. The supervision mission will comprise technical specialists as required. The participation of Government representatives such as from the MALR, MOIC and other implementing partners will be encouraged in the supervision process. There is also a strong case for SAIL to have increased budgetary resources for supervision given its importance in Egypt's country programme and the NEN portfolio.

Implementation Arrangements

56. The delivery mechanism envisaged in the SCCF Project will rely on the project implementation arrangements established in the SAIL baseline project: a mix of public, private sector and community led institutions. The implementation approach will envisage a high degree of stakeholder participation and grassroots involvement in order to bring villagers, including women, youth and the less advantaged into an effective force for change and self-reliance. A diagnostic process will be adopted to work in close collaboration with rural households through their institutions such as the Community

¹³ Active projects: Adaptation to Climate Change in the Nile Delta

¹⁴ Active projects: Enable poor communities in rural Upper Egypt and border governorates to adapt to climate change and market shocks, reduce agricultural losses through supporting national efforts to create sustainable livelihoods;

¹⁵ Active projects: Agricultural water productivity as a way of adapting to climate change and Adapting to climate change in the water sector in the MENA region.

¹⁶ Active projects: Green Economy Initiative.

Development Associations, ACs, WUGs and FMAS. The Project approach will tailor project activities and services to the needs of the target beneficiaries and ensure their capacity to operate and manage the services for long-term sustainability. The Project will ensure close partnership with rural institutions in a manner that clearly identifies the roles and responsibilities of each implementing partner from the outset.

57. Project Steering Committee: A high ranking inter-ministerial Project Steering Committee (PSC) will be set up for overall policy decisions and guidance at the national level. The PSC will be chaired by the Minister of MALR or his representative, with members representing EEAA, the Ministry of International Cooperation, Ministry of Irrigation, representatives from the relevant line ministries such as Education and Health and Participants Financial Institutions (PFIs). The PSC will meet biannually, and on an ad-hoc basis when necessary. It will have the primary responsibility of guiding the Project implementation activities and in all matters of policy regarding the Project. Specifically, the PSC will: (i) ensure that Project activities are in compliance with the Government's policies; (ii) approve consolidated Project AWPB; (iii) allocate the microfinance funds to PFIs; (iv) oversee the effective coordination and synergy between the different components; (v) ensure that Project interventions are coordinated with other development programmes and Projects; and (vi) oversee and monitor the systematic implementation of the Project and recommend changes where necessary in coordination with IFAD.
58. Project Management Unit: The PMU will be headed by an Executive Director appointed by the Minister of MALR and acceptable to IFAD. The PMU will report to the Minister and to the Project Steering Committee. The PMU will be based at the International Centre for Development and Training (ICDT) in Amriya and will be in close proximity to the National Office of the Graduates on Newlands, which is also based in Noubaria. The PMU and the RPMU will have the main task for implementing and overseeing all project components with technical assistance and support from selected implementation partners. The PMU/RPMU will be responsible for the implementation of the Community and Agricultural Development Components, as well as oversee the implementation of the Rural Finance Component and be responsible for the Project Management and Coordination.
59. SAIL will capitalize on the existing capacities and experience of WNRDP staff housed at ICDT, which will also ensure a quick start-up of Project activities in the Kafr-El-Sheikh area. The PMU will provide implementation support for certain Project functions such as financial management, procurement, monitoring and evaluation. The PMU will provide technical assistance, training and orientation to the newly recruited PMU/RPMU staff based on their experience in WNRDP. As an essential step towards ensuring continuity of staff during the project period, most of the Project staff will be recruited from the Project target area itself.
60. The PMU staff will comprise a Project Manager, a Community Mobilization Specialist, Civil Works Engineer, Marketing Advisor, Agricultural Extension Advisor, Gender & Poverty Targeting and Youth Advisor, National Credit and Enterprise Facilitation Specialist, Financial Manager, M&E Officer, Accountant and support staff. GEF funding will cover costs for a CC Adaptation Specialist who will be part of the PMU staff. All new Project staff will be recruited through open competition and be assigned to the Project on a full time basis. The Project will capitalise upon the experience of WNRDP by seconding qualified staff from the project to the SAIL Project.
61. The PMU will be responsible for coordination and liaison with implementing partners, the Government and Participating Financial Institutions, as well as overall Project programming, preparation of AWPBs, financial management including disbursement, procurement, preparation for audits, etc.), monitoring/evaluation and knowledge management.
62. The PMU will be responsible for ensuring the systematic collection of baseline data, monitoring and evaluation, progress reporting and liaison with the Government. It will also be responsible for providing logistical and administrative support to supervision missions, mid-term reviews and Project completion reports.
63. Where required, services of technical specialists and agencies will be recruited for specific tasks such as governance, strategic management and planning training as well as vocational and enterprise training. The PMU will recruit technical assistance based on performance-based contracts and oversee and supervise their work.
64. Regional Project Management Units: Three RPMU will be established in Lower, Middle and Upper Egypt that will coordinate and implement Project's activities in the selected settlements. Given its proximity to the ICDT, the RPMU for Lower Egypt will be based in the PMU. The RPMUs will have the primary responsibility for preparation of regional level AWPBs, identifying farmer organizations and strengthening them, ensuring participation of women, working closely with technical assistance,

manage Project funds at the governorate level, monitoring and evaluation, reporting and providing support to supervision missions.

65. RPMUs will report to the PMU. Each unit will comprise a Regional Project Manager, who will be an specialist with relevant experience, authority and good networking capability with the farming community and other Project implementing partners. Other staff will include Agriculture Extension Officer, Livestock Specialists, Community Specialists and women and men Community Mobilisers, NRM Officer, Local Engineer, Market Facilitation Officer, M&E Officer, Regional Credit and Enterprise Facilitation Specialist, technical assistance for overseeing participation of women, accountant and support staff. Other short term staff might be recruited based on the Project's needs. RPMUs will send progress report to the PMU and maintain direct contact and interactions with relevant local level GOE agencies, private sector and civil society organizations involved with Project implementation.

B.2 Describe the socioeconomic benefits to be delivered by the project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environmental benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF).

66. The GEF project, in alignment with the mandates of GEF and SCCF, focuses on identifying, implementing, modeling and transferring best practices in adaptation to the effects of climate change. With funding from GEF, SAIL as a whole will become an innovative programme in which climate change resilience and adaptive capacity among rural communities is put into practice by means of experimental pathways, including economic ones, closely shared with the beneficiary populations.
67. To help reduce energy costs, the project will introduce solar energy pumps, solar panels for lighting among groups of farmers and introduce bio-gas technology. Empirical studies of the agriculture sector confirm that the enhanced utilization of new agricultural technology can play a crucial role in increasing total factor productivity, increasing labour and agricultural wages. The project will provide technical assistance in the selection and installation of appropriate solar pumping systems that will vary with the geographical location and specific site. Collective systems will be provided to groups of farmers for about 20 feddans. The formation of clusters and shared solar systems will be expected to lower the initial capital costs. The project will ensure that the private sector suppliers of the new technologies provide appropriate technical training to people from within the community to ensure proper operation and maintenance of the systems.
68. The change from diesel and electric pump sets to solar powered pumping units is expected to save between 25~30 MW/day from the national grid. The pumping units are envisaged to be direct DC submersible pumping units, which are more cost efficient and work on variable voltages. The system will cater for field requirements of night pumping which is necessitated due to the rotational availability of water for limited days in a week. Automatic power converter modules can be integrated in the system to allow for auto switching from solar, to utility grid or even to a gen-set as may be required. The project will provide a loan facility for farmers who opt to replace their old inefficient diesel pumps with new units integrated with efficient irrigation systems.
69. An integrated waste management programme will be implemented under the project. While the solid waste management (refer Community Development Component) will support employment generation through recycling and promote safe disposal of waste at the community level. The waste will be sorted at the household level into recyclable and organic waste. The composting unit established under WNRDP has been a great success and similar experiences are quoted in several developing countries¹⁷. The key is integration with the solid waste management initiative, community mobilization, an effective pricing model and marketing linkages for the end product¹⁸. The composting units will be established after a detailed business and marketing plan has been prepared and will be preferably managed by the women and youth in the rural community. Investment under the project will be a mix of grants, loan and community contributions. The end product can be sold to the farmers or marketed as a high value product after appropriate packaging as has been the experience in India.
70. Training in new technologies will be provided to ensure sustainability. Under the project, training by appropriate specialists from the private sector will be provided to community groups in each settlement. Over the life of the project, training in solar technology will be provided to about 4500

¹⁷ D. Hoornweg et.al, "Composting and its Applicability in Developing Countries", The World Bank, 1999.

¹⁸ R. Linzner, et.al, Recirculation of local organic waste in urban and rural agriculture – the impact on soil functions in Guinea/West Africa, March 2007.

persons and for bio-gas and composting to about 2700 persons. Overall, in each of the 30 villages, two days training will be provided twice a year for five years on solar technology and for three years on bio-gas and compost production respectively. Training will facilitate development of locally skilled cadre of youth trained in installation, maintenance and repair of efficient irrigation systems, solar systems, construction and maintenance of bio-gas units, maintenance of solar dryers, electricians, plumbers and other related skills. This will help the youth to gain marketable skills and become engaged in productive livelihoods.

71. Groups of progressive farmers from the three regions will be afforded the opportunity to learn about new emerging soil-less technologies such as, hydroponics, automated irrigation systems and fertigation techniques through on-field exchange visits within Egypt and or neighboring countries. Each group could comprise of 4~6 farmers. Special attention will be given to farmers from Lower Egypt and some villages in Upper Egypt who are having increasing problems with salinity, rendering their lands less favourable for cultivation.
72. The project will support farmers to capitalise on the comparative advantages in their respective regions for getting the local and external markets. Cooperatives in Lower Egypt will be directly linked to the FMAs already established under the WNRDP. The regions of Middle and Upper Egypt have several comparative advantages that the project will capitalize on. These include a climate that favours harvesting of crops much earlier than other parts of Egypt or Europe, thus providing a favourable market window. These regions also have good soil and water quality with low level of salinity and pollutants relative to the delta region. They also have relatively low labour costs.
73. Experience in the IFAD WNRDP project and the UERDP as well as various value chain assessments and studies indicate that all project areas have significant advantages and open market windows for a large number of fresh vegetables, fresh fruits, herbs and spices, frozen vegetables and dried vegetables. The project will provide access to finance as well as capital grants for ACs to establish climate-proof post-harvest infrastructure to reduce losses in quantity and quality of produce as well as to enhance the control of the cooperatives over the market price. These include collection centres, drying and processing structures and equipment, sorting and packing stations, solar dehydration units, cold storage facilities, quality and food safety systems, among other issues that are essential to set-up an effective produce export supply chain etc. The selection of the type, size and specifications of such facilities will be based on production capacity and market assessments and will follow specific selection criteria that will be related to the productive and managerial capacity of the cooperative, the type of processed material required by the market (dried, fresh, distilled, frozen, juice, etc.), the quantities produced or required by the market, etc. The ACs will also be provided training in the management, as well as operation and maintenance of the facilities. The market associations form WNRDP will be used as a training resource for the SAIL project.
74. The household budget analysis shows an increase by 38% of the net agricultural incomes with a large share generated by the increase in the livestock revenues (in the logframe, target of 40%). This is consistent with the statistics of the importance of livestock in the farmer incomes. After introduction of the net benefits from health and education, the net increase in the household's income would be around 49%.
75. The theme of vulnerability to the effects of climate change will be addressed by prioritizing an approach to climate change adaptation with the direct involvement and active participation of rural communities (Community Development Associations) in specific assisted activities, to build their resilience and the adaptability of their productive and economic activities to the effects of climate change. The approach selected by the GEF project is based on several principles: (i) strengthen reflection, coordination and exchanges on strategy around climate change adaptation issues and the mountain zones; (ii) territorial integration of value chains, taking into account problems in the zone in relation to the value chains adapted to climate vulnerability and local conditions; (iii) promote exchanges and scaling up among various areas; and (iv) seek out co-financing and develop synergies among donors to reinforce actions in the field and meet demand.
76. The GEF Project has developed a very proactive strategy for the participation of women in Project activities especially recognizing that women are highly vulnerable to CC, and play a key role in agriculture and domestic activities but are the faceless and voiceless farmers of Egypt. The Project will have specific gender disaggregated targets and budget allocations, appropriate gender balanced staffing, gender action plans and conduct periodic gender audits and integrate gender aspects in all reports. Each of the components will have an approach to encourage the inclusion of women and specific targets have been identified for women. Most of the activities to be undertaken by the CDAs will be designed keeping in mind women's priorities and needs. The identification of enterprises and employment opportunities will be required to address opportunities of relevance for women. In the

agriculture diversification Component greater participation for women will be facilitated by their participation in Agricultural Cooperative or special groups within these forums.

77. The project is innovative in ensuring full integration of the private sector and cooperatives in a process that will support a transition from business as usual to climate adaptation by diversified and optimized agriculture, leveraging and intensifying IFAD's investment.

B.3 Explain how cost-effectiveness is reflected in the project design.

78. The project is mainly investment-oriented with a view to maximize the impact per GEF dollar. Project management and M&E costs are maintained at the lowest possible level. Investments in a sector that is significantly affected by climate change exacerbated risks, such as drought, heat waves and land degradation, through well-targeted investments in climate-resilient irrigation plans in modernized water distribution and irrigation systems to allow farmers' associations to make an optimized use of water. The development of the adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains and the improved agriculture production and market competitiveness through investments in climate-resilient VC technologies and diversification strategies will increase the capacity of beneficiaries – especially women - to operate autonomously without external economic aid, leading to stronger agriculture sector with higher return and improved food security.
79. Cost-effectiveness will be further analyzed during project inception and implementation. The project proposal has been developed with the aim to ensure cost-effectiveness and sustainability also after the project completion. In spite of costs for adopting new equipment, the shift to solar power for water pumping and the innovative irrigation technologies allow for a highly efficient performance, as they provide a more efficient use of water and energy, higher soil water infiltration and greater soil moisture-holding capacity the help minimize the effects of drought and run-off erosion, helps reduce the impact of soil extreme temperatures in crops, and improves soil health conditions resulting in higher yields and crop diversification with a positive effect in food security. The use of renewable energies will reduce perishability and energy costs, while providing means to diversify production, including the use of part of the agriculture waste for bioenergy production. Operational and maintenance costs are low, due to estimated 60-70% lower fuel use, 20-50% lower fertilizer and pesticides use, 50% reduction in machinery and labour requirement.
80. Long-term sustainability will be sought through a broad CB programme under Component 3 of the SCCF intervention, designed to create a critical mass of efficient practitioners, will integrate participatory elements to fully address issues that affect the long-term sustainability of natural resources and the welfare of local communities.
81. Replicability will be ensured with the dissemination of the lessons learnt produced by the project, through broad knowledge-sharing and communication actions targeting individual farmers, farmer organizations, and cooperative/small-enterprise members in the two target areas, and by including the good practices developed by the project into the relevant policy documents and frameworks that will guide the financing of new agriculture adaptation projects in the targeted areas and elsewhere in Egypt.
82. The implementation of climate-proof water and energy infrastructures and the optimization of the use of water will contribute to reduce CC-related risks and improve environmental services needed for sustainable agriculture production in the long-term. Furthermore, the introduction of solar dryers and hydroponic and aquaponic technologies, and the promotion of composting will increase economic opportunities for smallholders, and especially for women, while reducing environmental risks.
83. The sustainability of the project is also guaranteed by the full involvement and empowerment of all actors throughout the multi-stakeholder processes in the various components of the project, mainly through the development of climate-resilient adaptation plans in the targeted communes. Smallholders and farmers' organizations (e.g. water users organizations, producers' organizations and cooperatives) will be the main targets of the awareness raising and capacity building programme, and they will be the main beneficiaries of the components on production/processing/marketing improvement and the provision of new technologies. Partnerships among VC actors will strengthen each individual actor in the VC and will facilitate the investments in climate-resilient technologies, and the production, processing and marketing of high quality products.
84. The SCCF intervention addresses the adaptation priorities identified by the Ministry of Water Resources & Irrigation (MWRI) through the 2013 a national strategy of adaptation to CC, as well the sectoral strategic reflections in the "Egypt's gender and CC national strategy" developed by CEDARE in collaboration with the International Union for Conservation of Nature (IUCN) and the Participatory

Development Programme (PDP)/CC Adaptation and Resilience in Informal Urban Area, led by The German Cooperation Agency (GIZ).

85. The project will seek synergies and cooperation with relevant initiatives, mainly the UNIDO/"Promoting Low-carbon Technologies for Cooling and Heating in Industrial Applications in Egypt" and UNDP/"Grid-Connected Small-Scale Photovoltaic Systems in order to ensure the use of the most advanced technologies in Agriculture". The project will be linked to ongoing regional and global programmes to ensure exchanges and dissemination of information at a wider scale using the IFAD website, UNFCCC, GEF and other platforms for experience sharing.

C. DESCRIBE THE BUDGETED M&E PLAN

Monitoring and Reporting

86. **Role of M&E in results-based project management.** The main objectives of M&E are: (i) to provide timely and accurate information on implementation progress and constant feedback into the Management Information System (MIS) for decision-making and addressing potential plan deviations and problem areas; (ii) to evaluate the performance of implementing agencies and service providers; and (iii) to assess achievements at the levels of outcomes and impact. Project monitoring and evaluation will be conducted in accordance with established IFAD and GEF procedures. In line with the GEF/SCCF operational principles, the SCCF M&E activities will be country driven and provide for consultation and participation in a decentralized manner, actively involving target groups and service providers, who will be duly informed about the plans, implementation and the results of evaluation activities.
87. The main objective of the proposed SCCF project will be to lessen the impact of climate change on vulnerable rural groups as well as on the natural resources critical for crop and livestock production, thereby increasing food security. The project will undertake a baseline assessment and participatory resource mapping exercise in village, including a rapid vulnerability assessment, to define the baseline status prevalent before the initiation of the project activities in the project areas. Basic data and information relevant to the project will be collected, and project indicators will be measured at this stage.
88. The M&E system will be designed to offer comprehensive and reliable information to improve planning and decision-making for results-based management. The logical framework will constitute the basis for results-based M&E. The M&E system will have a three-tier structure: (i) output monitoring with focus on physical and financial inputs, activities and outputs; (ii) outcome monitoring assessing the use of outputs and measure benefits at beneficiary and community levels; (iii) impact assessment assessing project impact for the target group in comparison with objectives. All M&E data, analysis, and reporting will be disaggregated by gender. All M&E activities will be based on IFAD's Guide for Project M&E.
89. The SCCF intervention will be fully blended with the IFAD baseline operations (SAIL Project) so they will share the monitoring and evaluation system. The overall responsibility for M&E activities will rest with the M&E Officer, based at the Project Management Unit (PMU), and reporting to the Project Director. The M&E Officer will establish a data collection, analysis and reporting system to track physical and financial performance and emerging impact.
90. The Project will conduct, at its onset, a Start-up Workshop, with the aim of sensitizing and training the MOIC, MALR, the PMU/RPMUs, and other potential implementing partners. The project's logical framework will be reviewed at a Start-up Workshop. The Project team will fine-tune the progress and performance/impact indicators of the project at the Inception Workshop with support from IFAD and project partners. Specific targets for the first year of implementation, progress indicators, and their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team.
91. Periodic monitoring of implementation progress will be undertaken by IFAD. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities. A part of the participatory M&E will be devoted to ascertain the extent of women's participation in project activities, constraints faced, benefits gained, aspirations met and impact on women's status in the family, their involvement in community affairs and the climate-proofing of their agriculture. Measurement of impact indicators related to adaptation benefits will occur according to the schedules defined in the Inception Workshop. The measurement

of these will be undertaken through subcontracts or retainers with relevant institutions, or through specific studies that are to form part of the projects activities, or periodic sampling.

92. **Reporting.** Harmonized project progress reports will be produced quarterly, semi-annually, and annually. Reporting progress will be made available for each of the five target States as well as consolidated for the whole project area.
93. Two Mid-Term Reviews will be undertaken in PY3 and PY5 covering: (i) physical and financial progress in comparison with the annual work plans and budgets (AWPB); (ii) performance assessment of service providers; (iii) institutional and national policy changes arising from project activities; (iv) opportunities for deeper integration of implementation within national systems; and (v) overall progress towards the achievement of project objectives. At the end of the project, a Project Completion Report will be prepared by the Government, with IFAD support, to examine the overall project performance, taking into account a broader and longer-term perspective.
94. The project will use locally adapted RIMS (IFAD Results and Impact Management System) surveys at baseline, mid-term and completion, as the main quantitative survey tool to provide information on three levels of results: (1st) project activities and outputs; (2nd) project outcomes, reflecting changes in beneficiaries behaviour, improved performance and sustainability of groups, institutions and infrastructure; (3rd) project impact on child malnutrition and household living standards. Ad hoc surveys, qualitative case studies and thematic reviews will be outsourced to independent institutions to verify results and draw lessons on themes such as climate resilience and adaptation, market access, community empowerment, infrastructure development and food security improvement.
95. **Learning and Knowledge Management.** The SCCF operations will create valuable knowledge in climate resilience and adaptation on natural resources management, crop and livestock management, income diversification, community empowerment, infrastructure development and food security improvement, which will be captured by the PMU/RPMUs and utilized to generate lessons and best practices to be shared with public institutions, the IFAD country team, partners and others. In terms of Knowledge Management, operational experiences will create valuable knowledge in the target areas, which will be captured and utilized to generate lessons and best practices to be shared with beneficiaries, public institutions, the IFAD country team, partners and others.
96. The project will promote: (i) knowledge networking through periodic seminars/workshops; (ii) publication of 'how-to' leaflets, and (iii) audio-visual material that capture lessons learnt and impact. Special emphasis will be placed on knowledge regarding climate change adaptation and climate-risk reduction. The vulnerability assessments to be undertaken at village level will be the basis for that, ensuring it guides adaptive long-term planning regarding development work in the reclaimed lands. Main anchoring points for knowledge management will be identified, including research institutions, civil society, regional KM networks and specialised service providers. The project will also promote: (i) in-country knowledge networking through periodic seminars/workshops; (ii) regional knowledge networking, such as the regional network on Knowledge Access for Rural Inter-connected Areas (KariaNet) for the management and sharing of knowledge, information and experience in agriculture and rural development in the Middle East and North Africa (MENA); and (iii) regional research networks including those supported by IFAD grants.

Evaluation

97. Mid-term Evaluation - An independent Mid-Term Evaluation will be undertaken at the end of project year 3 and project year 5 of implementation. The Mid-Term Evaluation will take the form of a qualitative study to determine the progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the project's term, including the revision of indicators if needed. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by IFAD.
98. Final Evaluation - An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by IFAD. The final evaluation will be carried out in a synergetic and coordinated fashion with Final Impact Evaluation that will be carried out for the baseline project SAIL to assess: (i) Project

effects and impact; (ii) sustainability of those effects; (iii) potential for upscaling Project activities; (iv) lessons learned from implementation and recommendations for follow-up interventions; and (v) SAIL's outcomes and impact contributing to the achievement of national objectives in the rural sector.

Monitoring and evaluation plan and budget

Type of M&E activity	Responsible Parties	Budget US\$ (SCCF contribution) Excluding project team Staff time	Time frame
Inception Workshop (IW) and report	GEF Coordinator/ PMU/SIUs	USD 10,000	Within first two months of project start up
Annual Progress Report (APR) and Project Implementation Report (PIR)	Project Team IFAD		Annually
Tripartite Review (TPR) and TPR report	Steering Committee Project team IFAD		Every year, upon receipt of APR
Steering Committee Meetings	Project Coordinator IFAD		Following Project IW and subsequently at least once a year
Two Mid-term Evaluations	Project team IFAD External Consultants (i.e. evaluation team)	USD 25,000	At the mid-point of project implementation.
Final External Evaluation	Project team, IFAD External Consultants (i.e. evaluation team)	USD 25,000	At the end of project implementation
Terminal Report	Project team IFAD External Consultant		At least one month before the end of the project


PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):
(Please attach the Operational Focal Point endorsement letter(s) with this form. For SGP, use this OFF endorsement letter).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
ENG. AHMED ABOU EL SEOUD AHMED	GEF OPERATIONAL FOCAL POINT	MINISTRY OF STATE FOR ENVIRONMENTAL AFFAIRS	27 JULY 2014

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
John McIntire Associate Vice President, Programme Management Department IFAD		24-4-15	Rami Abu Salman, Lead Climate and Environment Specialist, Environment and Climate Division IFAD	+39 06 5459 2291	r.salman@ifad.org

ANNEX A: PROJECT RESULTS FRAMEWORK

Logical Framework

Narrative Summary	Key Performance Indicators	Means of Verification	Assumptions/ Risks
Project Goal			
<i>Increase food security and incomes for poor rural women and men through climate resilient agriculture.</i>	<ul style="list-style-type: none"> 60% HH have increased climate resilience. 40% HH have improved asset ownership index compared to baseline (RIMS). 	<ul style="list-style-type: none"> RIMS baseline and impact surveys. UNICEF/WFP food security surveys. Government statistics. 	<ul style="list-style-type: none"> Stable political and security situation. Macro-economic conditions improve.
Project Development Objective			
<i>Enhance farmland productivity and income diversification in the reclaimed lands.</i>	<ul style="list-style-type: none"> Average income of 24,000 target HH increase by 40% at Project completion. At least 40% farmers reporting production/yield increase at Project completion. 	<ul style="list-style-type: none"> RIMS, baseline survey, mid-term and completion assessments. Governmental surveys and reports. 	<ul style="list-style-type: none"> Conducive government policies. Stability in agriculture prices.
Component 1: An enabling policy environment for planning and implementing climate resilient agriculture in the reclaimed lands/ Contributes to CCA-1 and CCA-3 Total GEF Budget: USD 941,000			
Outcome 1.1: CC adaptation measures for crop production in reclaimed lands are mainstreamed into relevant policy frameworks and decision-making tools.	<ul style="list-style-type: none"> 20 staff members from relevant governmental institutions and departments (MALR, EEAA, EMA, CLAC, CCICRE) have acquired knowledge on CC downscaling methodologies to analyze CC impacts and adaptation needs on agriculture and irrigation water use in the target areas. Relevant policy documents (e.g. CC Adaptation Technology Needs Assessment) and progress reports to Regional Initiatives for CC impact assessment on water and agriculture prepared by EEAA in collaboration with other relevant institutions, and based on project results. Relevant MALR policy frameworks have mainstreamed CC adaptation for land and water management in agriculture production in the reclaimed lands. A Dynamic Agriculture Information and Response System (DAIRS) to support farmers in effective planning and preparedness to overcome climate-related risks is developed by MALR, tested in the target areas, and become operational at the national level through a sustainable public-private partnership agreement. 	<ul style="list-style-type: none"> National and State level statistics and inventories. Policy documents and strategies. MoU between MALR and private institution for management of DAIRS. 	<ul style="list-style-type: none"> All key public and private stakeholders are willing to engage in development and implementation of measures for vulnerability reduction. DAIRS embedded and budgeted properly in Government services.

Narrative Summary	Key Performance Indicators	Means of Verification	Assumptions/ Risks
Component 2: Optimized irrigation water management at the tertiary and on-farm levels / Contributes to CCA-1 and CCA-2 Total GEF Budget: USD 3,597,600			
Outcome 2.1: Water users are enabled to design and implement climate-resilient irrigation plans.	<ul style="list-style-type: none"> Optimal cropping patterns and efficient irrigation plans are developed for selected VCs in the 4 target areas. 7,400 farmers are trained on the designing and implementation of climate-resilient cropping patterns and irrigation plans. 4,200 members of WUGs are trained in new irrigation technologies and management systems. 	<ul style="list-style-type: none"> Baseline reports and rangeland productivity records. Field questionnaires. 	<ul style="list-style-type: none"> Key concerned stakeholders are willing to engage in the project activities. Adequate knowledge, expertise and tools are available.
Outcome 2.2: Investments in modernized water distribution and irrigation systems allow farmers' associations to make an optimized use of water.	<ul style="list-style-type: none"> 24,000 HH have access to rehabilitated/modernized irrigation schemes. Efficient irrigation systems established by 1,400 HH in 7,000 feddans (2,940 ha). 22 aquaponic and hydroponic pilot farms are established in the 4 target areas. 	<ul style="list-style-type: none"> HH income surveys. Interviews/focus groups. Project monitoring reports. 	<ul style="list-style-type: none"> Target HH and other key actors are willing to become involved. The project can secure the required technical capacity. Suitable technologies are available in the country.
Component 3: Climate proofing of crop value chains and (income improvement) diversification of local livelihoods / Contributes to CCA-1 and CCA-2 Total GEF Budget: USD 2,901,400			
Outcome 3.1: The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed.	<ul style="list-style-type: none"> 24,000 practitioners are trained on CC adaptation agronomic systems and technologies. The members of at least 50 CDA and ACs are trained on climate-resilient VC technologies. About 40 farmers (50% women) are trained as facilitators and extension providers to support FFS. 	<ul style="list-style-type: none"> Training evaluation forms. Interviews/focus groups. Project M&E system 	<ul style="list-style-type: none"> All concerned actors are willing to engage in development and implementation of capacity building and to participate in FFS. The project is able to provide relevant TA.
Outcome 3.2: Beneficiaries have improved agriculture production and market competitiveness through investments in climate-resilient VC technologies and diversification strategies.	<ul style="list-style-type: none"> 60% beneficiaries report improved production and marketing based on climate-resilient technologies. 100 agriculture cooperatives access grants for climate-resilient production, processing and diversification equipment. 200 women-led small-enterprises access grant funding for climate-resilient income diversification opportunities. 	<ul style="list-style-type: none"> Interviews/focus groups. Companies register books. Project M&E system. 	<ul style="list-style-type: none"> No major conflicts in the villages to prevent the communities from collaborating with each other. Suitable equipment and inputs are available in the country.

ANNEX B: RESPONSES TO PROJECT REVIEWS (FROM GEF SECRETARIAT AND GEF AGENCIES, AND RESPONSES TO COMMENTS FROM COUNCIL AT WORK PROGRAM INCLUSION AND THE CONVENTION SECRETARIAT AND STAP AT PIF).

STAP Comments	GEF Responses
1) Clarify the structure of the proposal and connectivity among components	<ul style="list-style-type: none"> • The connectivity among project components has been clarified in the GEF Full Project Document: <ul style="list-style-type: none"> (i) Component 1 addresses the development of enabling policies that facilitate and enhance the adoption of the climate-resilient agronomic systems and technologies promoted under Component 2 and Component 3 in the reclaimed lands; Moreover, Component 3 will support the development of a Dynamic Agriculture Information and Response System (DAIRS) that would help improve long-term forecasting to enhance the farmers' capacity in the reclaimed lands to cope with and respond to climate change related hazards. (ii) Component 2 addresses all aspects related to the project supported agriculture value chains, in terms of climate-resilient systems and technologies for production (e.g. Conservation and organic agriculture systems; IPM; composting for organic fertilization; etc), post-harvesting and processing (e.g. solar technologies for drying several agriculture products), and marketing (e.g. supporting the Farmers marketing associations accessing the organic agriculture market opportunities). Climate-proof technologies for selected value chains will also allow reduce the perishability of the produce and the diversification of production (e.g. production of fresh and dry tomatoes; production of dry herbs and medicinal plants; etc) increasing farmers' resilience to climate shocks. (iii) Component 3 addresses all aspects related to climate-resilience in the efficient use of water in agriculture, both on-farm efficient irrigation systems and technologies in areas where soil conditions are suitable for agriculture, and soil-less cropping systems (e.g. hydroponic and aquaponic) in areas where soil conditions may prevent agriculture practices due to soil salinization, etc. The fact that agriculture in Egypt in general, (and namely in the reclaimed lands) is fully dependent on irrigation explains why there is a first project component addressing key water-related issues promoting water use efficiency and water saving technologies compatible with the CC projections of the Nile flow reduction and with the need to balance water supply for agricultural and human consumption.
2) Clarify how assisting farmers' association in marketing contributes to CC adaptation	<ul style="list-style-type: none"> • The project will support the development of climate-resilient value chains, in terms of adoption of systems and technologies for CC adaption in production (e.g. Conservation and organic agriculture systems; IPM; composting for organic fertilization; etc), post-harvesting and processing (e.g. solar technologies for drying several agriculture products), and marketing (e.g. supporting the Farmers marketing associations accessing the organic agriculture market opportunities). • To encourage the private sector participation in the project, it will also be given access to financial services under the project. This relationship will be further strengthened where speciality products such as certified produce, organic products and high quality products can guarantee a premium. • The project's emphasis on disseminating principles of good agricultural practices, soil health and organic production, as well as the use of renewable energies and waste management systems,

	<p>will all contribute to a much more sustainable system of land use, higher quantity and quality of crop production, and to more diversified products accessing a wider range of market opportunities, all in all increasing farmers' resilience to CC.</p>
<p>3) Clarify how CC would be integrated into what policy and which planning process</p>	<ul style="list-style-type: none"> • Staff from relevant governmental institutions and departments (MALR, EEAA, EMA, CLAC, CCICRE) will acquire knowledge on CC downscaling methodologies to analyze CC impacts and adaptation needs on agriculture and irrigation water use in the target areas. • The project will support the preparation of relevant policy documents (e.g. CC Adaptation Technology Needs Assessment) and progress reports to Regional Initiatives for CC impact assessment on water and agriculture by EEAA, in collaboration with other relevant institutions, and based on project results. • The project will support the mainstreaming of CC adaptation in relevant MALR policy frameworks for land and water management in agriculture production in the reclaimed lands. • A Dynamic Agriculture Information and Response System (DAIRS) to support farmers in effective planning and preparedness to overcome climate-related risks will be developed by MALR, tested in the target areas, and become operational at the national level through a sustainable public-private partnership agreement.
<p>4) Take into account the diverse needs for water (agriculture and human use)</p>	<ul style="list-style-type: none"> • The baseline SAIL will finance substantial investments in drinking water, health and education infrastructures and related services will be developed around them. The provision of <u>potable drinking water</u> would also reduce some illness (labour time lost), water-borne diseases especially for the under-5, and the time spent in water collection. <u>Nutrition</u> would be enhanced through the diversification of the agricultural crops and the development of livestock. The construction of schools and the literacy classes would enable <u>education benefits</u> in terms of improved literacy and increase the job opportunities for the educated children although these benefits are not quantified in the EFA. • The GEF investments in water efficiency and water-saving technologies will take into consideration both CC adaptation needs and balancing water supply for the different agriculture and human consumption needs.
<p>5) Provide evidence of positive outcomes from previous projects focused on resettling population, and how this evidence will be applied in designing</p>	<ul style="list-style-type: none"> • Based on the success of the West Noubaria Rural Development Project (WNRDP) in reclaimed lands, the GOE has requested IFAD for assistance in helping to design a new investment in some of the newly settled lands. The proposed baseline SAIL project was designed to scale up the successful experience of the WNRDP project in establishing and strengthening rural institutions especially Community Development Associations (CDAs), Agriculture Cooperatives and strengthen the arrangements for water management and establish farmers' market associations (FMAs). The experience of West Noubaria with strengthening market associations and helping farmers with contract farming with the private sector will be used for scaling up. Investment in these rural institutions is of paramount importance given that the Government is planning to reform the agriculture cooperative law which will give them much greater flexibility to function as independent, farmer owned, profit- oriented organizations in the future. • Various donor-funded programmes, including WNRDP, have proved that Agriculture Cooperatives can be organized and trained to better manage irrigation infrastructure, farm equipment and undertake collective marketing activities in reclaimed lands. Agriculture Cooperatives can group to form Marketing Associations (MAs) with the capacity to engage in accessing better price for their produce through collective marketing by meeting Global-GAP

	<p>and organic certification requirements. This will entail signing contract farming arrangements where appropriate.</p> <ul style="list-style-type: none"> • The proposed project will be designed to scale up the successful experience of the WNRDP project in establishing and strengthening rural institutions especially Community Development Associations (CDAs), Agriculture Cooperatives and within them Water User Groups (WUGs) and FMAs. There is also need to improve the corporate governance of these rural institutions, strengthen their leadership, enhance transparency, and accountability. The project will put in place participatory and demand driven processes for establishing and strengthening these institutions. Investment in these rural institutions is instrumental given that the Government is planning to reform the agriculture cooperative law which will give them much greater flexibility to function as independent, farmer owned, profit-oriented organizations. • Many of the irrigation channels, drainage structures and pumping stations are functioning at low capacity due to poor maintenance. The baseline SAIL project will provide resources for rehabilitating the irrigation and drainage systems, fix the broken pumps in close collaboration and participation of water user groups, etc. Given the water scarcity in the targeted areas and the CC projections about future reduction of the Nile water flow, the GEF project will also capitalise upon the opportunity of introducing innovative water and energy efficient technologies. The project will scale up the successful experience of WNRDP in which farmers were given access to credit for the introduction of efficient irrigation systems. This will help in increasing the efficiency of water use, increase area under irrigation and make the distribution of water more equitable. To help reduce energy costs, the project will introduce solar energy pumps, solar panels for lighting among groups of farmers and introduce bio-gas technology. Empirical studies of the agriculture sector confirm that the enhanced utilization of new agricultural technology can play a crucial role in increasing total factor productivity, increasing labour and agricultural wages. • The introduction of more efficient irrigation systems such as drip irrigation significantly reduces the quantities of water used by the farmers, e.g. increase the water productivity. Currently, most of the farmers of the visited target areas are using flood irrigation, which is highly inefficient. Studies in West Nubaria have demonstrated a reduction by 38 to 50% of the water consumption from flood to drip irrigation depending on the crops. Substantial gain of water can thus be expected as drip irrigation spreads in the project area, associated with water users groups and improved infrastructure. In the WNRDP, an impact study estimated that the area under drip irrigation increased by 375% over 8 years. • The GEF project will also build on successful experiences in Egypt on soil-less hydroponic and aquaponic technologies, such as the private enterprises "Egyptian Hydrofarms" and "Makar Farms".
6) Define further the adaptation benefits and the additional cost reasoning	<ul style="list-style-type: none"> • Already addressed in the GEF Full Project Document and CEO Endorsement.
7) Increase village selection criteria beyond poverty	<ul style="list-style-type: none"> • The proposed targeted villages will be selected from the sites that the Government has allocated for settlement and rehabilitation over the last 15 to 20 years, with considerable investments in terms of housing, road infrastructure, primary and secondary canals and drainage infrastructure. These lands are located in Upper, Middle and Lower Egypt. The GEF will focus on the new lands where the land is suitable for agriculture, which have been slow to develop but could provide an important source of livelihood

	<p>to poor and vulnerable households. The GEF will represent an opportunity to reduce vulnerability to CC and prevent mal-adaptive practices in the reclaimed lands that are cropped for the first time and reduce risks of salinity, etc, etc...</p> <ul style="list-style-type: none"> • The GEF will put special focus on women population, because they are especially vulnerable to CC (higher workload due to the migration of men population; higher investment of time in child education and health, looking for water and energy; lower access to finance and land tenure; etc). However, women tend to focus more on practical and innovative improvements such as seeking alternative water supplies, protecting local assets, planting new crop varieties or supplementing traditional incomes through the diversification of activities, all in all using resources more efficiently, and environmentally friendly than men. The project will include some villages that are especially vulnerable and disadvantaged such as El-Samaha village comprising solely of widows and divorced women. Experience of IFAD's investments in West Noubaria tells us that women graduates, as well as women from small farmer households, play a critical role in the development of the new lands. Women are keen to participate in community activities, participate in opportunities for learning and engaging in enterprises such as baking, tailoring, fruit processing, kitchen gardening, livestock and poultry keeping and finding other employment opportunities, etc. There are virtually no facilities for the young in these new communities for higher learning, entrepreneurship, employment or recreation. Thus, the youth will be an important target group in the new project.
8) Better reflect the already existing base of information on regional climate projections and how it is being used for agriculture planning and decision-making	<ul style="list-style-type: none"> • The GEF project will invest in the installation of weather stations and the development of a Dynamic Agriculture Information and Response System (DAIRS) that would help improve long-term forecasting to enhance the capacity to cope with and respond to climate change related hazards. This system takes into consideration the most updated regional climate projections (see GEF Full Document Annex 5) to carry out the modeling and delivering early warning to extreme events (heat waves, frost, cold waves, storms, epidemic outbreaks of pests and diseases...) as well as provide response advice relevant to extreme events; accurate irrigation scheduling that reduces the cost of irrigation and minimizes water overuse; early pest and disease forecast and advice to allow suitable time for taking necessary actions and; proper calculation of sowing and harvest dates to maximize production.
9) Explain the GEF CC adaptation contribution to value chains beyond baseline interventions	<ul style="list-style-type: none"> • See point 2)
10) To what extent diversification is possible?	<ul style="list-style-type: none"> • The project will provide grants on a competitive basis to groups and individuals for starting small businesses that promote diversification and help in enhancing their adaptive capacities. At least 100 grants in kind will specifically target poor women, women headed households, landless women and youth, and in particular, the most vulnerable who do not qualify for loans. • The project will arrange for vocational and enterprise development training through specialist service providers. Prior to providing the training, a market review will be conducted to ensure that these skills and vocations can generate employment. • The training opportunities will include providing young men and women appropriate skills and vocations to become plumbers, electricians, masons, bakers, tailors, barbers, butchers, etc.

	<ul style="list-style-type: none"> • New employment and income diversification opportunities related to the project CC adaptation interventions will be investigated and identified in discussion with women and young beneficiaries, such as the processing of fruit, vegetables, herbs and medicinal plants, recycling of waste, composting, maintenance of drip irrigation, solar panels and pumps, bio-gas units, etc. • Solar dryer units for the processing of fruits, vegetables, herbs and medicinal plants, will specifically target women CDAs where they show an interest or Agriculture Cooperatives. In order to ensure sustainability, the dryers will be provided after a detailed business plan is prepared including development of a marketing plan and establishment of linkages with the private sector. The CDAs/Agriculture Cooperatives will have to evolve to a level where they can ensure effective management of not only the technology but also the ability to manage the required volumes of herbs, aromatic plants, or vegetables that are to be processed. Extension services in technology and marketing will be provided through a training programme to the selected CDAs/Agriculture under the project. This initiative is expected to be introduced once the CDAs/Agriculture Cooperatives have been mobilized and strengthened and where production levels justify their use. • The private sector suppliers of irrigation systems and solar energy will also be invited to participate in training the youth in the new techniques, looking at establishing local businesses around the maintenance of the new climate-proof equipment.
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ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS¹⁹

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF:			
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF/NPIF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To-date</i>	<i>Amount Committed</i>
1. Team Leader and Climate Adaptation Specialist	38,400	38,400	38,400
2. Mapping and Vulnerability Assessment Specialist	8,800	8,800	8,800
3. Environmental Specialist	8,000	8,000	8,000
7. Travel **	8,727	7,782	7,782
8. PPG management	6,073	6,073	6,073
TOTAL	70,000	69,055	69,055

¹⁹ If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

**THE INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT
THE GLOBAL ENVIRONMENT FACILITY
(Special Climate Change Fund)**

**THE ARAB REPUBLIC OF EGYPT
INTEGRATED MANAGEMENT AND INNOVATION IN RURAL SETTLEMENTS IN
EGYPT
PROJECT DOCUMENT**

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May 2015

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Currency Equivalents

Currency Unit	=	Egyptian Pounds (EGP)
USD 1:00	=	EGP 7.23
EUR 1:00	=	EGP 9.01

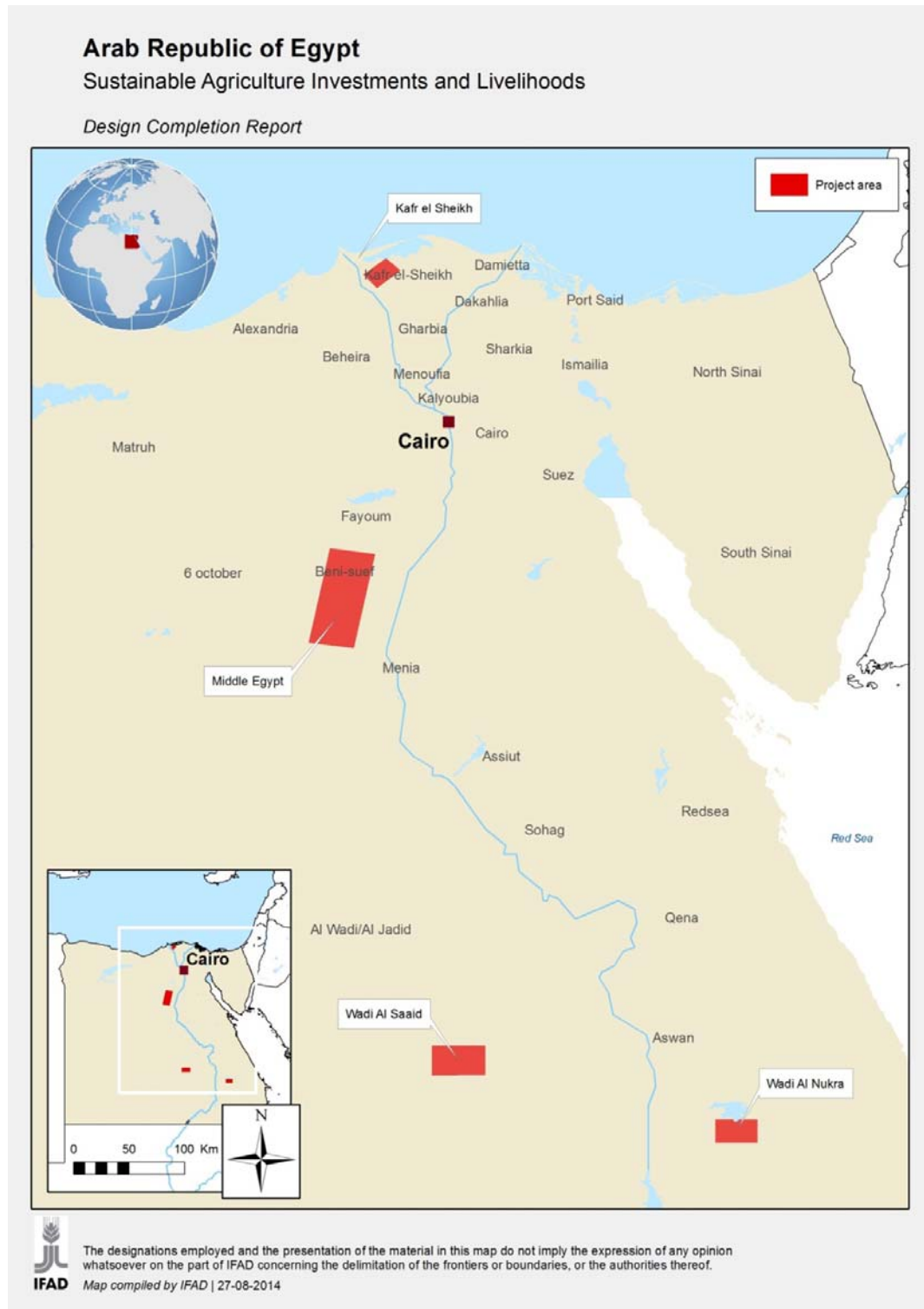
Weights and Measures

1 Kilogram (kg)	=	1,000 gram
1.00 Kg	=	2.204 lb.
1 kilometre (km)	=	0.62 miles
1 metre (m)	=	1.09 yards
1 square metre (m ²)	=	10.76 square feet
1 feddan	=	0.42 ha = 1.03 acres
1 acre (ac)	=	0.405 hectare
1 hectare (ha)	=	2.47 acres

Abbreviations and Acronyms

ADP	Agriculture Development Programme
ACs	Agriculture Cooperatives
AfDB	African Development Bank
APIP	Agricultural Production Intensification Project
ARC	Agricultural Research Center
ASAP	Adaptation for Smallholder Agriculture Programme
CAPMAS	Central Agency for Public Mobilization and Statistics
CBE	Central Bank of Egypt
CDAs	Community Development Associations
CIB	Commercial International Bank
COSOP	Country Strategic and Opportunities Paper
EDNASP	East Delta Newlands Agricultural Services Project
EGP	Egyptian Pound
EHDR	Egypt Human Development Report
EIRR	Economic Internal Rate of Return
GAP	Good Agriculture Practices
GDP	Gross Domestic Product
GCSRL	General Cooperative Society for Reclaimed Lands and Land Reclamation
GEF	Global Environmental facility
GNI	Gross National Income
GOE	Government of Egypt
ICDT	International Centre for Development and Training
IFAD	International Fund for Agriculture Development
IIP	Irrigation Improvement Project
IIIMP	Integrated Irrigation Improvement Management Project
MA	Marketing Associations
MALR	Ministry of Agriculture and Land Reclamation
MFIs	Micro-finance institutions
MIC	Ministry of International Cooperation
MSEs	Micro and Small Enterprises
MTR	Mid-Term Review
NGOs	Non-Governmental Organizations
OFIDO	On-Farm Irrigation Development on Old Lands Project
PBDAC	Principal Bank for Development and Agriculture Credit
PMU	Project Management Unit
PRIME	Promotion of Rural Incomes through Market Enhancement Project
PSC	Project Steering Committee
RPMU	Regional Project Management Unit
RIMS	Results and Impact Management Systems
SAIL	Sustainable Agriculture Investments and Livelihoods Programme
SEDO	Small Enterprise Development Organization
SFD	Social Fund for Development
UERDP	Upper Egypt Rural Development Project
USD	United States Dollar
WNRDP	West Nubaria Rural Development Programme
WUG	Water User Groups
YSG	Youth Savings Groups

Map of the Project Area



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Executive Summary

Egypt is one of the hottest and sunniest countries in the world, with very low humidity. The area of agricultural land in Egypt is confined to the Nile Valley and delta, with a few oases and some arable land in Sinai. The total agricultural land in Egypt represents only 3.5 percent of the total area. The agriculture sector is a key sector in the Egyptian economy, providing livelihoods for 55% of the population and directly employing about 30% of the labour force. Agriculture depends exclusively on the Nile and water efficiency is low due to high water losses. Agriculture in Egypt faces some critical challenging issues: rapid population growth straining the country's natural resources; agriculture land being lost to urbanization and sand encroachment; increasing fragmentation of holdings; increased soil salinisation; water pollution from agriculture pesticides, sewage, and industrial effluents; low productivity due to the low percentage of certified seeds used by farmers; climate change trends of higher temperatures, changing hydrologic regimes, and higher frequency and intensity of extreme weather events.

Egypt's water and agriculture resources are vulnerable to increased climate variability and a growing human pressure. Future climate change will be likely to exacerbate this vulnerability with significant impacts on hydraulic and agriculture ecosystems. Significant impacts will also be expected on the poorest people in rural areas that are also the most vulnerable to CC. Over the period from 1960 to 2005 annual temperature in Egypt has increased by 2.1 °C, with increasing number of warm and very warm days (EEAA-MSEA, 2010). Precipitation has not significantly changed over the past decades. The severity and frequency of flash flooding, sand storms, and haze has also been documented in recent years. Climate change scenarios predict between 1.5 °C and 3.6 °C rise in temperature by 2050. The projected increase in temperature is perceived to widen the gap between water resources and demands, decrease the overall agriculture productivity, and increase the competition over the natural resources. The effects of sea level rise on the coast of the Nile Delta would reduce the area under cultivation and the agricultural production (SNC, 2010). Climate change impact studies also predict a reduction in the productivity of the major crops. The vulnerability of Egypt's water resources to climate change entails those affecting Nile flows, rainfall, and ground water.

Although climate change is projected to have serious impacts on agricultural sector in Egypt, modest efforts and steps are taken in scientific research, mitigation and adaptation. Studies concluded that changing cultivars, crop patterns, sowing dates and management practices are the most promising adaptation measures that could be applied at the national level to overcome the harmful impacts of climate change on crop production (Medany et al., 2009). In 2011, the GOE prepared a *National Strategy for Adaptation to Climate Change and Disaster Risk Reduction* aiming at increasing the adaptive capacity of the Egyptian communities to deal with climate-related risks and reducing impacts on vulnerable sectors. The Strategy assesses the impacts of CC, indicates a set of adaptation and risk reduction measures per each sector, and proposes an operational framework for the CC adaptation programme. The SNC also recommends a set of CC adaptation priorities for the agriculture sector. These and other initiatives contribute to draw the outlines of a national vision for adaptation to CC. Nevertheless, there is no national strategy/program/plan of adaptation to CC in Egypt through addressing adverse effects of CC and increasing climate resilience.

IFAD is a small donor in Egypt in terms of the volume of financial assistance it provides compared to others. However, its assistance is highly valued by the GOE and has been targeted very strategically to the agriculture sector and the smallholder farmer in particular. The scope of IFAD grants programme has been broadened to include in addition to agriculture technical issues, gender mainstreaming, the development of knowledge-sharing networks, promotion of microfinance for the rural poor and institutional capacity-building. So far, IFAD projects have benefited 1.3 million households or 7 million people and covered 447,000 feddan (188,000 ha).

The SCCF project "Integrated Management and Innovation in Rural Settlements in Egypt" has the goal to increase food security and incomes for poor rural women and men through climate-resilient agriculture. The proposed area of the project will be selected from the sites that the Government has allocated for settlement and rehabilitation in Upper, Middle and Lower Egypt. The Government has identified 97,971 feddan (41,147 hectares) spread over 30 settlements for selection in the proposed

project. The GOE has made considerable investment in terms of housing and infrastructure. However, in some areas, the progress of resettlement and land development has been slow due to the lack of the full range of social and economic services that are required for successful settlement. In other areas, the settlement is complete, but the productive potential has not been fully realised due to the limited capacity of the smallholder farmers to invest in the new lands, rural enterprises or diversify their livelihoods.

The Development Objective is to enhance farmland productivity and income diversification in the reclaimed lands through increasing by 40% the average incomes of 60% rural poor household engaged in livestock value chains, with 30% of the target smallholders participating actively in commercial farming and business development by the end of the project. IFAD estimates that by the end of the project at least 24,000 households in the target area will have increased climate resilience and will have sustainably moved out of poverty.

The project will be shaped around three main lines of work, or Components:

Component 1 "An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands" responds to the request of MALR and EEAA to build their capacity to analyze the climate change impacts on agriculture production and water management in the reclaimed lands, and mainstream suitable CC adaptation measures and technologies in relevant policy frameworks and documents.

Component 2 "Optimized irrigation water management at the tertiary and on-farm levels" will focus on the rehabilitation and modernization of the tertiary level irrigation canals, pumping stations and conveyance systems, with the use of innovative renewable energy technologies, and the introduction of on-farm micro-pressurized drip irrigation equipment to make an efficient use of the scarce water resources and prevent salinisation problems.

Component 3: Climate proofing of crop value chains and diversification of local livelihoods will provide extension services, training to farmers, institutional support to farmers' organizations, and funding to support investments in climate-resilient value chains.

It is expected that the project will target around 40,000 rural households or 280,000 people in the new settlements as well as provide some support to the adjoining areas engaged with them for the provision of social and economic services. The profile of the target group is one of poverty, food and nutrition insecurity and vulnerability. A strong community mobilization strategy will be put in place to prevent elite capture of community development associations, agriculture cooperatives, water user groups, and farmer marketing associations.

The SCCF project is fully embedded in the IFAD SAIL baseline project in a synergetic fashion that will ensure that GEF funding covers additional costs associated with CC adaptation needs, in line with the governmental priorities on climate change. The planned duration of the project is 7 years starting in late 2015. The proposed project will assist the baseline SAIL supported households to increase agriculture profitability in the reclaimed lands, to select optimal cropping patterns with more water efficient crop types and varieties, and to make an optimal use of natural resources – water, soil, plant and animal species, renewable energy - to adapt the farming systems to CC predictions, ensure sustainability in natural resources management, and achieve the maximum net return per unit of water. This will be done by diversifying crop and livestock production, absorbing landless labour and youth, and creating opportunities for productive employment for women and contribute to poverty reduction, food security and gender equity.

The GEF project represents an opportunity to increase the scope of the poverty reduction and food security objectives pursued through the IFAD SAIL baseline in light of the predicted negative impacts of climate change on agriculture and livestock production in Egypt. The GEF financing will aim at increasing the climate resilience of agriculture and livestock value chains in the reclaimed lands through the introduction of renewable energies in the water pumping systems and the post-harvesting and processing equipment, the adoption of efficient irrigation technologies, the piloting of soil-less hydroponic and aquaponic technologies, the recycling and use of waste through composting and bio-gas technologies, and the promotion of climate-resilient agronomic systems, cropping patterns, livestock breeds and crop types and varieties.

The GEF project will invest significant effort in enhancing the adaptive capacity of all concerned institutions, organization and actors, from the ministerial level, to the local beneficiaries and other value chain actors, with special emphasis on the women population, benefiting a total of 40,000 households in 30 villages of 5 Governorates. The project adaptation benefits will also have a national-wide impact at the policy level.

IFAD will coordinate with all UN agencies wherever possible, and attempt to partner particularly with UNIDO and other government and non-government institutions in identifying and deploying innovative technologies and solutions. The GEF intervention will complement other relevant GEF-financed initiatives in Egypt.

IFAD will be responsible for the coordination and supervision of SCCF, in accordance with GEF standards and procedures. The delivery mechanism envisaged in the SCCF Project will rely on the project implementation arrangements established in the SAIL baseline project: a mix of public, private sector and community led institutions. The implementation approach will envisage a high degree of stakeholder participation and grassroots involvement in order to bring villagers, including women, youth and the less advantaged into an effective force for change and self-reliance. GEF funding will cover costs for a CC Adaptation Specialist who will be part of the PMU staff of the baseline programme. The SCCF project will be fully embedded into the baseline SAIL Project. Total project costs are estimate at USD 45,944,600 over a seven-year implementation period. The financial sources are: GEF resources of USD 7,812,000; IFAD resources of USD 32,379,000 in the form of soft loan, and USD 5,753,600 in the form of two grants.

I. SITUATION ANALYSIS

a. Country Context

Geography, Climate, and Environment

1. Egypt lies between 32° N and 22° N latitude, and between 25° E to 35° E longitude. The country is bordered by the Mediterranean Sea to the north, by Sudan to the south, by the Red Sea, the Palestine Authority and Israel to the east, and by Libya to the west. The total area of Egypt is 1,001,450 km², with a coastline of 3,500 km on the Mediterranean and the Red Sea.
2. The Egyptian territory consists of a vast desert plateau interrupted by the Nile Valley and Delta, which occupy about 4% of the total country area. The land surface rises on both sides of the valley reaching about 1,000 m above sea level in the east and about 800 m above sea level in the west. The highest point of the country, at Mount Catherine in Sinai, is 2,629 m above sea level and the lowest point, at the Qattara Depression in the northwest, is 133 m below mean sea level.
3. The majority of the country area is desert land. Most of the cultivated land is located close to the banks of the Nile River, its main branches and canals, and in the Nile Delta. Rangeland is restricted to a narrow strip, only a few km wide, along the Mediterranean coast and its bearing capacity is quite low. There is no forestland.
4. Egypt is one of the hottest and sunniest countries in the world, with very low humidity. Only along the northern coastal strip do winter cyclonic disturbances moving eastwards along the Mediterranean Sea bring some significant rainfall and, even at Alexandria on the coast, total annual rainfall averages are only 196mm. Some 160km inland at Cairo, average annual rainfall has reduced to 25mm and southwards it reduces still further to only 5mm at Hurghada on the Red Sea coast and less than 2mm at Aswan in the Nile valley. In central and southern Egypt several years may pass without any significant rain. When rain does fall it is usually in the form of a brief and sometimes damaging downpour.
5. Annual mean temperatures increase from around 20°C on the Mediterranean coastline to around 24°C on the Red Sea coastline, 25°C at Cairo and 26°C further south at Aswan with a seasonal variation of about ±7°C. Typical daytime maxima in mid-summer range from 30°C at Alexandria to 41°C at Aswan southwards; while the corresponding north-south range in mid-winter daytime maxima is 18-23°C. This makes even winter daytimes in the south pleasantly warm and sunny, albeit with cool nights, as further north.
6. Climate hazards include heat waves, localized floods, and dust storms, with the particularly phenomenon in spring and early summer of a dry and dust laden “khamsin” wind that carries very hot air northwards into northern Egypt ahead of weak cyclonic disturbances in the Mediterranean.
7. The River Nile is the main source of water for Egypt, with an annual allocated flow of 55.5 km³/yr under the Nile Waters Agreement of 1959. Internal renewable surface water resources are estimated at 0.5 km³/yr. This brings total actual renewable surface water resources to 56 km³/year. Internal renewable groundwater resources are estimated at 1.3 km³/yr. The total actual renewable water resources of the country are thus 58.3 km³/yr. The Nubian Sandstone aquifer located under the Western Desert is considered an important groundwater source, but this is fossil groundwater. The main source of internal recharge is percolation from irrigation water in the Valley and the Delta
8. Recent studies recognize 8 agro-climatic zones in Egypt (Khalil, et al, 2011) (Figure 1). Water requirements are similar within each zone and different between zones. In all these zones, the Nile River is main source for irrigation, except for North Sinai governorate, where precipitation is the main source for irrigation and El-Wadi El-Gedid, where the main source for irrigation is ground water.
9. The area of agricultural land in Egypt is confined to the Nile Valley and delta, with a few oases and some arable land in Sinai. The total agricultural land in Egypt is 8.4 million feddans¹ (3.52 million ha) representing only 3.5 percent of the total area. Agriculture depends exclusively on the Nile and consumes 77% of its annual water supply. Water efficiency is low due to high water losses. Water conveyance efficiency is estimated at 70% and the mean efficiency of field irrigation

¹ A feddan is a unit of area used in Egypt and the Sudan. 1 feddan = 4,200 square meters or 0.42 hectares.

systems is estimated at only 50%². Water distribution and management systems have been partially and ineffectively decentralized. The country is already experiencing severe water poverty. The situation is not likely to improve as climate change and population growth combine to raise the risks of inadequate water supplies, conflict over the available supplies, and further pressure is expected from the exploration of Nile resources by other members of the Nile Basin Commission.

Figure 1: Classification of Egypt into eight agro-climatic zones³ (zones 1, 5 and 8 are the target agro-climatic zones for the project)⁴.

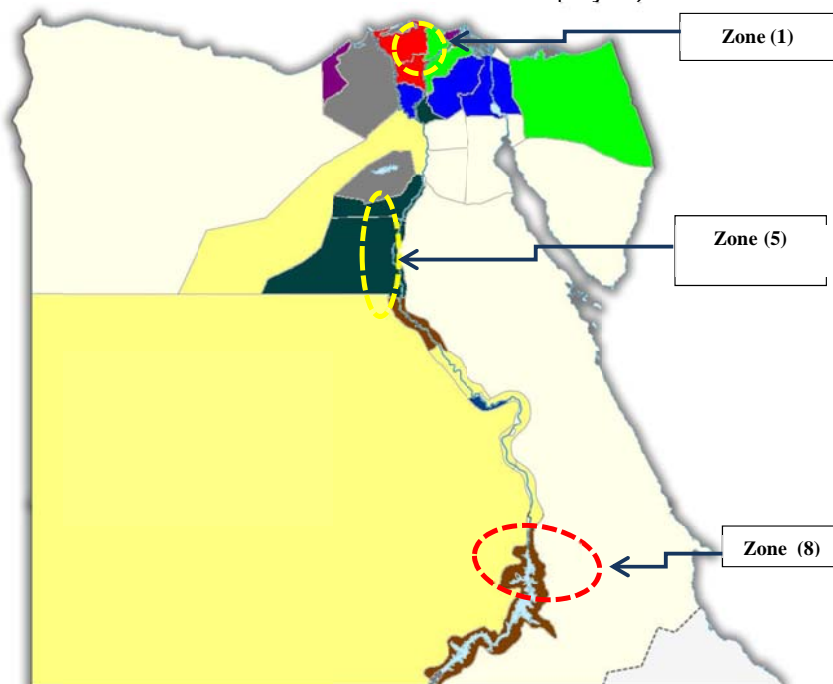


Table 1: Some agriculture features of the 8 agro-climatic zones in Egypt.

Zone	Total area (km2)	% of cultivated area to total area	% of cultivated area to total area	Cropped area (km2)	Annual needed irrigation water (m3/km2)
1	5379	4048	75	4691	113754
2	31045	3356	11	6078	156789
3	3268	1201	37	2356	64034
4	8166	6061	74	11366	332007
5	4585	4033	88	7524	228750
6	465001	4237	1	7117	240434
7	10945	5339	49	10721	388108
8	26605	2225	8	3689	139957

The economic context

10. Egypt has one of the most developed and diversified economies in the Middle East. Until 2010, Egyptian economy was growing on average 5% as a result of several economic reforms attracting foreign investments⁵. During that time, the economy and the living standards for the majority of

² Sustainable Agricultural Development Strategy Towards 2030. Ministry of Agriculture and Land Reclamation. Arab Republic of Egypt, October 2009.

³ **Zone (1):** Kafr El-Sheikh and El-Gharbia (red color); **Zone (2):** El-Dakhliya and North Sinai (light green); **Zone (3):** Alexandria and Demiatte (purple color); **Zone (4):** Ismailia, El-Sharkia and El-Monofia (dark blue color); **Zone (5):** El-Kalubia, Beni Sweif and El-Minia (dark green color); **Zone (6):** Giza, Quena, Sohage and El-Wadi El-Gedid (yellow color); **Zone (7):** El-Behira and El-Fayoum (grey color); **Zone (8):** Assuit and Aswan (brown color).

⁴ Fahim, M.A. (2014).

⁵ <http://www.tradingeconomics.com>

population improved. Yet, living conditions for the average Egyptian still remained poor and large income disparities continued to grow, leading to the public discontent. The 2011 revolution, which brought down Mubarak's regime, have caused economic slowdown as political and institutional uncertainty and rising insecurity continue to hurt tourism, manufacturing, and construction.

11. GDP in Egypt expanded 3.7% in the second quarter of 2014 over the same quarter of the previous year. GDP Growth Rate in Egypt averaged 3.69% from 1992 until 2014, reaching a maximum of 7.30% in the first quarter of 2008 and a record low of -4.30% in the first quarter of 2011⁶.

Agriculture Sector

12. The Agriculture Sector is a key sector in the Egyptian economy, providing livelihoods for 55% of the population and directly employing about 30% of the labour force. Although contribution of the sector to GDP has fallen over time, it still accounts for about 13% of GDP and 20% of total exports and foreign exchange earnings. Industries related to agriculture, such as processing and marketing, and input supplies, account for a further 20% of GDP. Despite its importance, any attempts to deal with poverty alleviation in Egypt must address both farm and off-farm sectors. In rural households in Egypt, 42% of total income comes from non-farm sources, while 25% is derived directly from agriculture and 9% from livestock. The remaining 24% comes from transfers, remittances and rental incomes.
13. The major crops in Egypt include wheat (used as a staple food crop), maize (used primarily as coarse grain for animal feed), clover, cotton, rice (grown only in the Delta and the Fayoum Governorate in Middle Egypt), sugarcane (grown in Upper and Middle Egypt), sorghum, soybeans, citrus, and horticulture crops. The national wheat and maize production do not meet the current local demand and each year additional amounts have to be imported – up to 50% of total consumption in the case of wheat. Horticulture production covers a wide range of products due to favourable climate conditions and the potential for irrigation, which allows the production of a large range of products virtually all year round. The share of horticultural crops is 13% of the total land under cultivation, but represents 36% of the value of all crops produced. Horticultural crops are produced in sufficient quantities to meet domestic demand and to provide some surplus for export. Vegetables are grown in about 1.3 million feddans. Medicinal, aromatic and ornamental crops represent a rapidly growing farm business of importance for both domestic and external markets. Smallholder farmers are responsible for producing approximately 90% of all vegetables for the domestic market.

Table 2. The top crops in Egypt by harvested area, quantity and economic value (FAO, 2008).

Harvested area (x 1000 ha)		Quantity (x 1000 tn)		Value (x1000 USD)	
Wheat	1,220	Sugar cane	16,400	Tomato	2,180
Maize	819	Tomato	9,200	Rice, paddy	1,470
Rice, paddy	745	Wheat	7,970	Wheat	1,010
Tomato	240	Rice, paddy	7,250	Grape	710
Orange	222	Maize	6,540	Potato	488
Sorghum	154	Sugar beet	5,130	Date	415
Potato	137	Potato	3,560	Orange	375

14. Livestock contributes another 35% of the total value of agriculture GDP. Egypt has a large potential in milk production, however the levels of efficiency and productivity in the sub-sector are low. Egypt's dairy sector is still largely traditional with a majority of the population consuming unpasteurized milk.

Population and Poverty

15. According to the Central Agency for Public Mobilization and Statistics (CAPMS) 2014 census figures, the population of Egypt, (including those living abroad), is estimated to have reached 84 million at a growth rate of 37% over the 1996 figure of 59.3 million⁷. United Nations projections indicate that the population will continue to grow to 95.6 million by 2026 and 114.8 million before it stabilizes in 2065. Population in urban areas increased by 40% and is now at nearly 35 million people, and rural populations grew by 64% to roughly 46.5 million people. The Delta and the narrow valley of the Nile comprise 5.5% of the total area of Egypt but over 95% of its people, of which 25% live in the Low Elevation Coastal Zone (LECZ) areas.

⁶ Ibid.

⁷ Fahim, M.A. (2014) Climate change vulnerability assessment and awareness for smallholder farmers in rural societies in Egypt. Progress Report. IFAD

16. CAPMS maintains that Egypt's poverty rate increased over the year 2012/2013, reaching 26.3% compared with 25.2% in 2010/2011⁸ and nearly 25% live just above the poverty line⁹. Some 11.9% of Egypt's population is in extreme *multi-dimensional poverty*¹⁰. CAPMS also estimates, in 2007, that 12 million people or ~16% of Egypt's population live in slum communities. Data also shows that there has been an increase in inequality, with the Gini-coefficient rising from 28.7 to 31 between 2005 and 2010¹¹. While more recent data is not available, it is believed that inequality is still on the rise.
17. The rate of unemployment is estimated at 9.31%, and unemployment continues to be an overriding concern, especially for youth and women with many of the Egyptians working in the Middle East region returning home because of growing regional instability.
18. Despite the setbacks, Egypt is on track to achieve most of the MDGs and falls in the medium human development category¹². Between 1980 and 2012, Egypt's HDI value increased from 0.407 to 0.662, an increase of 63%, or an average annual increase of about 1.5%. While Egypt has successfully reduced infant mortality rates over the last decade, its young are faced with an alarming rate of malnutrition, especially chronic malnutrition and stunting among children under-five years of age has reached an alarming 29%. Malnutrition in children is typically caused by a combination of inadequate food intake and infection, which impairs the body's ability to absorb or assimilate food. During the last few years, the Ministry of Health and Population in Egypt has placed nutrition as one of its main priorities and developed a 10-year Food and Nutrition Policy and Strategy (2007–2017).
19. Although the Constitution of Egypt guarantees equal treatment of all citizens, this does not translate into equality of status or equal opportunities for women. Egypt ranks low on international indicators of gender equity. It has a Gender Inequality Index (GII)¹³ value of 0.59, ranking it 110 out of 148 countries in the 2013 index. In Egypt, 2.2% of parliamentary seats are held by women, and 43.4% of adult women have reached a secondary or higher level of education, compared to 59.3% of their male counterparts. Female participation in the labour market is 23.7% compared to 74.3% for men, marking a very large disparity¹⁴. But because much of their work is informal, it is estimated that in reality women account for more than 75% of the agricultural labour force in some parts of the country such as Upper Egypt.
20. Cultural norms and customary practices are key determinants of social and familial attitudes that influence the position and condition of women. The fact that women in Egypt have lower access to education, health services and productive resources makes them more vulnerable to poverty than men. Other factors that contribute to women's poverty include lower earnings and wage rates, lower participation and employment and their marginalization and exclusion from social, economic and political life. Women are estimated to earn the equivalent of 26% of men's income¹⁵. According to the 2012 report of Egypt's Central Agency for Census and Statistics, women are officially registered as comprising only 23% of the formal, registered workforce.

The Policy Framework

21. In its efforts to address poverty alleviation, and protect vulnerable segments of society, the Government of Egypt (GOE) has adopted a multi-pronged strategy. The GOE has been providing lands to unemployed agriculture graduates and households displaced from the old lands due to changes in land tenure arrangements. It has also taken proactive measures in other areas to deal with the problem of growing poverty and in-equality. The principal goal of the GOE is to attain higher GDP growth rates, maintain broad macroeconomic balance, and broaden the economy's capacity to absorb labour. This strategy gives priority to the creation of employment opportunities as the surest way to combat poverty. The GOE has been pursuing this poverty reduction strategy through five main avenues: (a) economic growth for increasing income and employment through investment in productive sectors; (b) increasing the efficiency of the agriculture sector, particularly water and land utilization to enhance yields, income and food security for the poor, (c) human development of the poor for raising their capability through education, health, and local

⁸ Central Agency for Public Mobilization and Statistics (CAPMAS). Arab Republic of Egypt, 2012.

⁹ The extreme poverty limit is an annual EGP 3,570 (US\$ 518) per person, which means approximately EGP 312 per month per person, or EGP 10 (approximately US\$ 1.5) per day per person).

¹⁰ World Food Programme, The Status of Poverty and Food Security in Egypt: Analysis and Policy Recommendations (2013).

¹¹ Economic growth, inequality and poverty: social mobility in Egypt between 2005 and 2008, 2009, World Bank, 2010.

¹² Egypt's Progress Towards Achieving the Millennium Development Goals (2010), p. 15.

¹³ The Gender Inequality Index (GII) reflects gender-based inequalities in three dimensions – reproductive health, empowerment, and economic activity.

¹⁴ Egypt Human Development Report, 2013.

¹⁵ UNDP, Egypt Human Development Report, 2008.

level organizations; (c) women's advancement and closing of gender gaps; (d) safety net measures for the poor, especially women, against anticipated and unanticipated income/consumption shocks through targeted and other efforts; and (e) participatory governance for enhancing the voice of the poor.

22. Agricultural policy in Egypt has gone through significant reforms since early 1990s. The Government has formulated a new *Sustainable Agriculture Development Strategy towards 2030* (SADS) in recognition of the fact that transformation of the agriculture sector is key for economic growth and development in Egypt. The objectives of the SADS towards 2030 are: (i) sustainable use of natural agriculture resources, (ii) increasing the productivity of both the land and water units; (iii) raising the degree of food security of the strategic food commodities; (iv) increasing the competitiveness of agriculture products in local and international markets; (v) improving the climate for agriculture investment; (vi) improving the living standards of the rural inhabitants, and reducing the poverty rates in the rural areas. Based on estimated population and agriculture growth rates, total agriculture investments needed for the achievement of the strategy objectives is estimated at about EGP 500 billion, with a projected annual growth rate of 4% until 2030.
23. The SADS adopts a bottom-up approach based on participatory methods at local levels to know the attributes, problems and constraints facing future development opportunities in the five agro-climatic regions of Egypt:
 - Upper Egypt: expanding and promoting modern technologies for sugar cane production, high-value leguminous trees, dry and semi-dry date varieties, sugar beet; establishing new sugar factories; encouraging and supporting farmers to establish voluntary associations; promoting organic agriculture, as well as early maturing vegetable and fruit varieties (e.g. green beans, grapes, pomegranate) to meet export requirements; expanding olive tree plantation and production.
 - Middle Egypt: expanding and promoting long-medium staple cotton varieties, and the productivity of main crops, especially wheat, maize; promoting oil seed crops and aromatic pastes for processing purposes; establishing infrastructure and institutional frameworks to enable the region to specialize in medicinal and aromatic plants; promoting small agriculture projects to increase income of the poorer families; promoting livestock production.
 - Eastern Delta and Sinai: establishing infrastructure and institutional framework to enable the region to specialize in organic production and exports; promoting the production of main crops (wheat, rice, groundnut and clover) and fruit tree crops (mango, peach, olive, citrus), and expanding the cultivation of sugar and fodder beet; promoting capture fisheries and aquaculture.
 - Western Delta: establishing the necessary infrastructure and institutional framework for promoting and expanding horticultural crops and olive trees for processing and export purposes; developing a programme for small farmers to conserve and develop the excellent animal breeding stocks; increasing the productivity of main crops (wheat, cotton, clover, rice, and potatoes); developing rainfed agriculture based on sustainable supplementary irrigation; developing suitable policies to establish agro-industrial communities; developing a programme for rangeland and establishing milk-collection centres; promoting aquaculture.
 - Middle Delta: increasing the productivity of main crops (wheat, clover, maize, cotton and citrus) and introducing clover-rice rotation; improving nurseries for fruit trees and ornamental plants; establishing the infrastructure, veterinary services, and institutional framework to promote milk, poultry and fisheries production; promoting rural women development projects and rural environmentally-sound industries; introducing suitable technologies and marketing systems for aquaculture products.
24. The Government of Egypt acknowledges the importance and the potential of the horticultural sector. In this regard its agriculture strategy is focused on the enhancement of agriculture productivity in order to support competitiveness of agricultural products in the local and export markets. This will be achieved through a number of initiatives with focus on horticulture, particularly for crops requiring low water usage and/or with high potential for export. The Government is putting great emphasis on increasing the per capita consumption and modernizing its milk sector. The GOE also recognizes the main reasons why farm income in rural Upper Egypt is lower than it is in rural Lower Egypt. These are threefold: (a) agriculture in Upper Egypt is dominated by traditional low market-value crops and therefore generates less revenue per cropped area compared to Lower Egypt; (b) farmers in Upper Egypt are unable to finance the higher costs and greater risks of growing non-traditional crops; and (c) average farm holdings in Upper Egypt tend to be smaller than those in Lower Egypt. In addition, rural poverty is exacerbated by the lack of sufficient alternative employment opportunities.

25. The Government has established some alternative avenues for rural finance provision. With donor assistance, GOE has established the *Social Fund for Development* (SFD) and the *Agriculture Development Programme* (ADP)¹⁶. These provide financial services to rural areas and the agriculture sector through special directed credit lines. SFD is now a major player in the provision of micro-finance in the country and operates as a wholesaler of financial services through its Micro Finance and Small Enterprise windows. ADP is a fund owned by the Ministry of Agriculture and Land Reclamation (MALR) and managed by the Commercial International Bank on their behalf. It was created to consolidate the revolving credit fund provided to the Ministry in several European Union (EU) funded projects targeted at the agriculture sector. ADP operates through 12 affiliated commercial banks, which in turn, provide both individual and collective loans directly or through Agriculture Cooperatives and selected Associations. ADP has provided credit mainly to the small and medium sized enterprises¹⁷. Its added strength is that through its investment income, the ADP also provides technical assistance for research and development for the agriculture sector.
26. The Ministry of Agriculture and Land Reclamation (MALR) and the Ministry of Water Resources and Irrigation (MWRI) have set an integrated plan for land reclamation through several mega projects targeting about 1.4 million hectares to be reclaimed by 2017. This plan considers two types of mechanisms to procure the required water resources for reclaiming the targeted areas. The first entails increasing the efficiency of the current agricultural water use, minimizing irrigation water losses, while the second entails increasing non-conventional water resources share in agriculture. This plan probably includes a set of steps towards the adaptation to CC and the improvement of the CC resilience of the smallholder farmers that are the most vulnerable to climate hazards.
27. The Egyptian Environmental Affairs Agency (EEAA) encourages the use of cleaner technologies through environmentally-friendly industrial zones and processes aiming at increasing the efficiency of the use of resources, including reuse, recovery and recycling in order to reduce the amounts of waste generated from production activities. However, investment offices in governorates are still needed to facilitate private sector participation. EEAA signed a protocol with the Federation of the Egyptian Industry (FEI) to promote cooperation for environmental protection in Egypt.
28. EEAA has submitted two national communication reports (first and second National Communications) to the UNFCCC, and the third one is currently underway.
29. To cope with CC risks at a national level, the Ministry of Water Resources & Irrigation (MWRI) has adopted in 2013 a national strategy of adaptation to CC. However, there has not been neither a thorough consultation process with the various partners nor a potential approval of the strategy. In addition to this national strategy, there are some strategic reflections at the sectoral level such as: (i) the "Egypt's gender and CC national strategy" developed by CEDARE in collaboration with the International Union for Conservation of Nature (IUCN); (ii) the Participatory Development Programme (PDP)/CC Adaptation and Resilience in Informal Urban Area, led by The German Cooperation Agency (GIZ).
30. For on-farm irrigation systems in Egypt, figuring out adaptation strategies is a high national priority. The current national plan for improving on-farm water management is an ambitious plan targeting 2 million ha in 10 years. The implemented plan will increase irrigation efficiency by 50 to 75%, which is equivalent to water needs for reclaiming about 1.21 million ha.
31. Regarding the improvement of coastal resources management planning and protection against impacts of CC, the Egyptian National Assembly (ENA) has recently approved new regulations to include Integrated Coastal Zone Management (ICZM) into developmental plans. This makes it necessary to have a strong institutional monitoring capability. In fact, the mainstreaming of CC in the strategic planning process development (national and sectoral) is limited and not meaningful. In this respect, there are some interesting initiatives to mainstreaming CC which should be supported in order to achieve more structured and systematic mainstreaming methodological approach.
32. On the other hand, Egypt ratified Kyoto protocol on 12/1/2005 followed by establishing the Egyptian Designated National Authority for Clean Development Mechanism "DNA-CDM". Investment costs of initially approved 55 projects in 2009 are USD 1243 million. These projects will reduce GHG by almost 8.3 Million ton CO₂ equivalent. They include reduction of nitrous oxide emission from fertilizer industry, renewable energy, fuel switching, methane capture and flaring from waste and energy efficiency improvement.

¹⁶ Formerly the Agriculture and Research Development Fund (ARDF).

¹⁷ About 80% of its financing is for SME financing.

II. Threat Analysis

a. Anthropogenic Threats

33. Agriculture in Egypt faces some critical challenging issues: rapid population growth straining the Nile and the country's natural resources; limited natural freshwater resources; agriculture land being lost to urbanization and sand encroachment; increasing fragmentation of holdings; increased soil salinization; water pollution from agriculture pesticides, sewage, and industrial effluents; low productivity due to the low percentage of certified seeds used by farmers; climate change trends of higher temperatures, changing hydrologic regimes, and higher frequency and intensity of extreme weather events.

Land and water constraints

34. Egypt has one of the poorest land/man ratios in the world¹⁸. Total cultivated land measures around 8.9 million feddan¹⁹ and is estimated to be only 3% of the total land area. While yields in the old lands are among the highest in the world for several key crops, yield improvements have slowed down markedly in recent years. For the non-traditional high value crops, yields are still much below the potential and the margin for improvement is quite high. In the new lands, yields are well below their potential. Egypt has to import about 40% of its food requirements.
35. Agriculture land in the Delta and the Nile valley regions suffers from two important problems: (i) continued encroachment on agriculture land diverting it from agriculture to non agriculture uses at an annual rate of 20,000 feddans; and (ii) continued degradation of soil fertility in so many agriculture areas²⁰.
36. Despite the state's efforts to expand reclamation of new lands, the per capita share of agricultural land and cropland is constantly decreasing due to the rise of small plot owners and the fragmentation of agricultural tenure. In addition, the special water canals and passages between these small plots have had to be lengthened.
37. Scarcity of water is another key constraint to agricultural growth. The climate in the country is arid with very low rainfall. The Nile River is the main and almost exclusive source of surface water. Agriculture depends exclusively on the Nile and consumes 77% of its annual water supply. Water efficiency is low due to high water losses. Water conveyance efficiency is estimated at 70% and the mean efficiency of field irrigation systems is estimated at only 50%²¹. Water distribution and management systems have been partially and ineffectively decentralized. The country is already experiencing severe water shortage and the deterioration of water use efficiency in agriculture limits the country's potential for agricultural expansion on the short term. It also limits its ability to withstand the increase in evaporation rates resulting from the rise in temperature. The situation is not likely to improve as climate change and population growth together raise the risks of inadequate water supplies and conflict over the available supplies, and further pressure is expected from the exploration of Nile resources by other members of the Nile Basin Commission.
38. The lack of awareness of water users is one of the factors affecting the pattern of consumption. For example, most farmers have the tendency to make use of surface irrigation instead of up-to-date irrigation techniques. Hence, natural resources are constantly misused; malpractices of excessive water use and waste dumping in waterways are commonplace. The lack of water awareness also leads to the reluctance of users to participate in positive programs and policies (even at the lowest levels, which requires no particular expertise) that are intended to raise the efficiency of water resource management systems.
39. The increasing rate of sewage and untreated or partially treated industrial waste into water canals, as well as agricultural drainage laden with fertilizer and pesticide remains, have led to the deterioration of water quality. As a result, occasionally, the agricultural drainage water plants that provide irrigation water by mixing agricultural runaway water with fresh water can no longer function, as the water coming from agricultural drainage canals is unsuitable for mixing. This, in turn, threatens the expansion in the policy of reusing drainage water.

Legislation constraints

¹⁸ Agriculture Census 1999/2000. Economic Affairs Sector. MALR. Government of Egypt.

¹⁹ Ibid.

²⁰ SDAS towards 2030 report.

²¹ Sustainable Agricultural Development Strategy Towards 2030. Ministry of Agriculture and Land Reclamation. Arab Republic of Egypt. October 2009.

40. Lack of harmonized legislations is considered as one of the limitations hampering the application of the principles of integrated water resource management as a result of overlapping jurisdictions, weak penalties and fines related to water violations and slow litigation process. Moreover, centralized laws and decision making require the amendment of such laws in a manner that is suitable for the new variables in water resource management, and give more space to the private sector to participate in investments in this important service sector. At the same time, an institutional reform of the different state organs is necessary, in a way that is commensurate with the requirements of integrated water management.

Financial constraints

41. Limited access to finance remains a key binding constraint for the development of the rural economy. An indication of marginalization of the agriculture sector in general and agriculture research in particular is the public budget allocation to the Agriculture Research Centre, which has been reduced to about EGP 70 million annually. The agriculture sector share of the total public investments is as low as 3%²². Such policies in public budget allocation would make the country more vulnerable to climate change risks and more exposed to food market fluctuations due to its dependence of food imports.
42. Only 10% of Egyptian adults have access to formal financial services and fewer than 4% of Egyptian adults took a loan from a financial institution in the past year²³. The commercial banking sector has considerable liquidity but it does not have the risk appetite to provide services to the agriculture sector. The Central Bank of Egypt (CBE) reports that bank loans to MSEs remain limited to less than 1% of total loans and that the agriculture sector receives less than 5% of total commercial bank credit²⁴. The Principal Bank for Development and Agriculture Credit (PBDAC) has been the country's main bank for provision of agriculture credit. However, it has been undergoing a restructuring process for the past few years and its past record of agriculture lending shows poor outreach to the smallholder and virtually no lending to smallholders on new lands²⁵.
43. Not only do financial services not reach the poor but the provision of services is hampered by the lack of appropriate loan products. The existing loan products are not designed to address the special characteristics of agricultural lending and are not able to remove some of the constraints along the value chain which require innovation in product development, flexibility in lending terms, collateral requirements and reduction in the cost of rural lending through the use of new technologies. There are no special loan products, which have been developed for settlers on the new lands, entrepreneurs or the youth. There is need to continue the process of innovation and technology development which will help to expand the provision of financial services to rural areas on a cost-effective and sustainable basis. Promoting financial inclusion can help expand private sector activity, and address economic challenges in Egypt. At the microeconomic level, access to and use of appropriate financial services improve household welfare and spur household enterprise activity.

Value chain Constraints

44. There is a high degree of variability in prices of agricultural commodities and limited market information. There is a lack of post-harvest and marketing facilities and low levels of agricultural industrialization. Estimates show that post-harvest losses exceed 30% for horticulture produce, 20% in legumes and tubers and 10% in cereals.²⁶ The high degree of perishability of horticulture and dairy produce leads to rapid quality deterioration and a consequent reduction in prices leading to reduced farmer incomes. An analysis of the differentials in the farm-gate and retail prices shows that the farmer gets between 10% to 35% of the retail price for perishable commodities. At the post-harvest level, marketing represents a significant bottleneck in Middle and Upper Egypt to rapid growth and higher incomes. Local markets are underdeveloped, and the marketing infrastructure (transport, cold storage, grading, processing and packing facilities) is poor. The small farmers are unable to meet market demand for high quality standards or adopt Good Agriculture practices (GAP), which will enable them to capture the niche GAP or Organic certified markets.

²² MALR (2013) Agriculture Sector: Policy Brief to Climate Change Adaptation of Agriculture Sector. MDGF.

²³ Global *Findex* 2012.

²⁴ Central Bank of Egypt. 2010.

²⁵ The Bank has recently cleaned its books and written off between EGP 4 to 5 billion from its outstanding loan portfolio.

²⁶ Sustainable Agricultural Development Strategy Towards 2030. Ministry of Agriculture and Land Reclamation. Arab Republic of Egypt. October 2009.

45. At the post-harvest level, marketing represents a significant bottleneck in Upper Egypt to more rapid growth and higher incomes. Local markets are underdeveloped, and the marketing infrastructure (transport, cold storage, grading and packing facilities) is poor, leading to a high rate of losses and waste, which limits efficient marketing and negatively affects the incomes of small farmers.

Institutional development and agriculture services constraints

46. Producers are not well organized into associations or cooperatives. This limits their bargaining power and their ability to capture the benefits of economies of scale and markets. Market information for smallholders is lacking not only in terms of prices and volumes, but also in respect of quality standards, especially for European and Gulf markets. Addressing poverty issues requires a balanced approach that promotes the optimization of production from small, intensively managed agricultural holdings, the development of on- and off-farm small and microenterprises, and support for marketing.
47. While the Government has invested considerable resources in building irrigation, drainage and road infrastructure on reclaimed lands, the lack of farmer organizations to properly operate and maintain the investments has led to deterioration of the infrastructure. Agriculture Cooperatives have not filled the critical need to organize farmers and special farmer associations are required to undertake the host of activities required for the purpose of production and marketing in the agriculture and livestock sectors.
48. The newly settled areas also lack access to a range of social sector and productive services essential for the growth and development of rural communities such as schools, health services, vocational and training services, nutritional advice to mothers, etc. These areas have also been unable to attract the private sector and lack access to financial and marketing services.

b. Climate change

49. Egypt's water and agriculture resources are exposed to increased climate variability and a growing human pressure. Future CC will be likely to exacerbate this vulnerability with significant impacts including hydraulic and agriculture ecosystems as well as hotspot socio-economic sectors namely water, agriculture, Nile Delta and health. Similarly, not less significant impacts will be expected on the poorest people in rural areas that are also the most vulnerable to CC.
50. There have been widespread warming trends over Egypt since 1960 with greater warming in summer (0.31 °C per decade) than winter (0.07 °C per decade). Over the period from 1960 to 2005 (sing data from 11 meteorological stations equally distributed over the country), annual temperature has increased by 2.1 °C, and it has been an increase in the frequency of warm nights and a decrease in the frequency of cool nights. Research also suggests increasing number of warm and very warm days (EEAA-MSEA, 2010).
51. Precipitation has not significantly changed over the past decades. Research shows evidence that the severity and frequency of flash flooding over Egypt has increased in recent years (EEA-MSEA, 2010)²⁷. Increase severity and frequency of sand storms and haze has also been documented.
52. Climate change scenarios predict between 1.5 °C and 3.6 °C rise in temperature by 2050²⁸. The atmosphere-biosphere interactions play a key role in the regional climate of Egypt. Climate model simulations shown that if semi-desert would be replaced by desert, and short grasslands would be replaced by semi-desert due to land degradation (e.g. overgrazing), summer temperature would increase by 1-3 °C and precipitation would decrease by 1.2-2 mm/day in Central Asia²⁹.

Climate Change Impact on Agriculture

53. The projected increase in temperature is perceived to widen the gap between water resources and demands, decrease the overall agriculture productivity, and increase the competition over the natural resources. The effects of sea level rise on the coast of the Nile Delta would reduce the area under cultivation and likely reduce agricultural production (SNC, 2010).

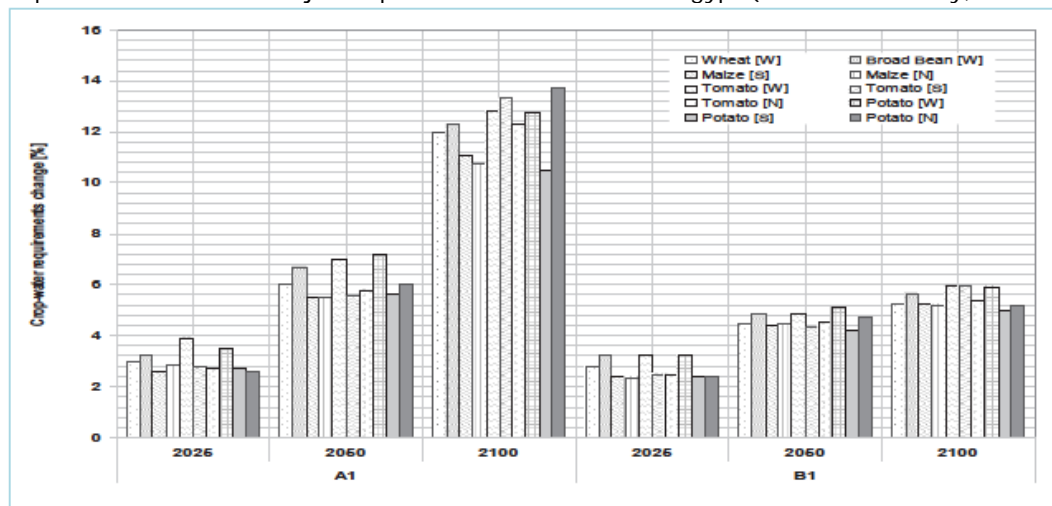
²⁷ An example of the exacerbation of extreme precipitation events was the heavy rain event in January 2010 exceeding 80 mm/day, that led to the worst flash-floods in Egypt since 1994. The floods affected the Sinai Peninsula, the Red Sea coast and the Aswan Governorate with material losses estimated at USD 25.3 million, 15 deaths, approximately 3,500 people evacuated and hundreds of homes destroyed (Attaher & Medany, 2011).

²⁸ Hassanein et al, 2009. In: Fahim, M.A. (2014).

²⁹ Gomboluudev et al, 2004.

54. Climate change impact studies that were based on field research, predicted a reduction in the productivity of the major crops in Egypt. Projected changes by 2050 for some important crops are: -15% for wheat, -11% for rice, between -14% and -19% for maize, -28% for soybean, -20% for barley, between -0.9 and -2.3% for potato, and +17% for cotton³⁰. The change in crop productivity are mainly attributed to the projected temperature increase, which affect the grain filling periods and have detrimental effects on sensitive development stages such as flowering, thereby reducing grain yield and quality³¹. Crop-water stress is the other factor causing productivity reduction under climate change (SNC, 2010).
55. Over 90% of crop production in Egypt is fed by irrigation. Projected future temperature rises in Egypt under climate change conditions are likely to increase crop-water requirements thereby directly decreasing crop-water use efficiency, and increasing the irrigation demands under all IPCC SRES scenarios up to 7% by 2060 and up to 13% by 2100.

Figure 2. Changes between current and future values (for the years 2026, 2060, 2100) of crop-water requirements for some major crops at the national level in Egypt (Attaher & Medany, 2008³²)



56. An important uncertainty in projections of crop yield is therefore the evolution of future water availability with climate change in Egypt. Global- and regional-scale studies generally project yield deficits for wheat, rice and maize, three of Egypt's major crops, with climate change. Whether crops are rainfed or irrigated has an important bearing on the results, and the balance between detrimental ozone effects and CO₂ fertilisation may determine whether losses or gains are realised under climate change. National-scale studies agree that crop yields in Egypt could decline with climate change, and that adaptation and management methods could potentially reduce the magnitude of any losses.
57. Due to the concentration of much of Egypt's infrastructure and development along the low coastal lands and the reliance on the Nile delta for prime agricultural land, coastal inundation or saline intrusion caused by anthropogenic climate change induced sea-level rise will have a direct and critical impact on Egypt's entire economy³³.
58. Recent scientific observations conclude that the severity of some pests and diseases affecting crops has increased in the last decades due to both climate and socio-economic causes (e.g. severe epidemics of tomato late blight, *Phytophthora infestans*, emerged in the last years in Egypt; the severity of damages caused by *Puccinia triticina* and *P. striiformis* in wheat cultivars has increased with increasing temperature). The limited investigations in pests and disease concluded that finding a balance between the public demand for reducing the use of pesticides and the pressure to increase pesticide utilization due to climate change will be a challenge for the agricultural sector in the future.
59. Climate-induced heat stress also reduces livestock productivity. New animal diseases, including Blue Tongue disease and Rift Valley fever, have emerged in Southern Egypt, in both cases

³⁰ Several authors, in Egypt SNC, 2010.

³¹ Fahim, M.A. (2014).

³² SNC, 2010.

³³ Fahim, M.A (2014).

attributed to observed changes in the climate³⁴. Women in Shouraneya village (Sohag Governorate) have reported fever incidences and cattle mortality due to higher temperatures. It is reported that the increase in temperatures are hazardous to laying hens, not only because of greater mortality rates, but also because of the reduction in the number and quality of the eggs produced³⁵.

60. The availability of fodder is at risk due to climate change impacts on crop productivity. Egypt is almost totally dependent in feeding livestock on clover, a winter fodder crop that is a high water consumer. With expected scarcity of water supply plus population pressures and the need to grow more winter wheat, the country will most probably tend to increase the wheat area at the expense of the area of clover. Farmers in Sohag Governorate reported that clover crops subjected to chill episodes at early stages of growth remained stunted.
61. Annual welfare losses in agriculture in 2060 are estimated to range from EGP 40 to 234 billion if adaptation measures are not implemented³⁶. Changes in agriculture-related employment are estimated from -39% to +3% and food prices increases of 16% to 68%³⁷.

Climate change impact on water resources

62. Food availability is largely influenced by the availability of water from the Nile, which in turn depends on Ethiopian rainfall and temperature regimes upstream. Nile flow is very sensitive to climatic changes: with a 20% percent reduction in precipitation and 2°C warming the decrease may be 88%. Only one of the ten scenarios for Nile flows developed by researchers³⁸ predict eventual increase in the distant future, the other nine scenarios show long term reduction ranging between 10% and 90% by the year 2095. Egypt relies on the Nile to provide 95% of its water resources, thereby the country's sensitivity to changes in precipitation rates on the Ethiopian Plateau and increases in temperatures and the associated evaporation losses is extremely high.
63. As 85% of water resources are used for agriculture, any deficit in Nile water flow will directly affect food production and security, particularly in Southern Egypt, where crop water demands will be increasing with temperature rises. This threat is not helped by the fact that Egypt is a water stressed country, where irrigation efficiency is low. Furrow irrigation is the most practiced means of irrigation. Average water use per acre is 50 m³/day, which is high. It is also worth noting that inefficient water management in the form of poor irrigation and drainage systems affects soil quality and productivity across the country.

CC Adaptation in the Egyptian agriculture sector

64. Although, climate change is projected to have serious impacts on agricultural sector in Egypt, modest efforts and steps are taken in scientific research, mitigation and adaptation. Studies concluded that changing cultivars, crop patterns, sowing dates and management practices are the most promising adaptation measures that could be applied at the national level to overcome the harmful impacts of climate change on crop production (Medany et al., 2009). Furthermore, in order to adapt to the expected disease severity for major crops, breeding of disease-tolerant cultivars is urgently needed. At the same time, monitoring system for the current and new races of plant pests and diseases in the country is highly required.
65. Regarding the impact of climate change on the national cropping patterns, a range of temperatures over a range of cultivars of major crop species were studied (Hegazy et al., 2008), indicating that sowing dates could be managed in order to allow maximum predicted planting area in a given region in Egypt. For instance, the current maximum area suitable for cotton planting may show few variations over the coming hundred years. In this case, sowing dates should be changed to cooler months. Simulation studies in Egypt (Abou-Hadid, 2006) showed that 10-day delay in wheat sowing date at the North Nile Delta might mitigate the negative impacts on crop productivity by 10%.
66. A great reduction in the wheat area is projected in the coming hundred years. Despite the early planting, a reduction of about 147 thousand acres/year is projected by the year 2075. On the other hand, with earlier sowing dates, the maximum areas that are planted by rice and maize will

³⁴ Egypt National Environmental, Economic and Development Studies (NEEDS) for Climate Change. Under UN Convention on Climate Change, April 2010.

³⁵ Dagher, N.J (2008) Nutrient Requirements of Poultry at High Temperatures, Poultry Production in Hot Climates.

³⁶ MALR (2013) Agriculture Sector: Policy Brief to Climate Change Adaptation of Agriculture Sector. MDGF.

³⁷ Ibid.

³⁸ Strezpek et al (2001) Constructing "Not implausible" Climate and Economic Scenarios for Egypt, Integrated Assessment 2,139-157, Integrated Assessment Society.

not be greatly affected by the projected increase in air temperature. Changing sowing dates could increase the flexibility of the farming system to face temperature and water requirements increase due to climate change, as a single factor effect. This adaptation option is facing some implementation difficulties related to the overall crop calendar arrangements, and it may be limited by the marketing opportunities, which may not match new harvesting dates, especially for cash crops.

67. For on-farm irrigation systems in Egypt, figuring out adaptation strategies is a high national priority. The current national plan for improving on-farm water management is an ambitious plan targeting 2 million ha in 10 years. If financial resources are to be secured, the implemented plan will increase irrigation efficiency by 50% to 75%, which is equivalent to water needs for reclaiming about 1.2 million ha. A recent study indicated that improving surface irrigation efficiency is likely to be much-needed for overcoming the negative impacts of climate change on on-farm irrigation systems in old lands. This measure could be acceptable only when power and economic resources are available and the reduction in the crop-yield is significant (Ministry of Agriculture and Land Reclamation, SADS2030, 2009). Furthermore, application of deficit irrigation measures is more acceptable during water shortage circumstances, compared to reduction of irrigated area.
68. Finally, using different combinations of different levels of improved surface irrigation system efficiencies and applying deficit irrigation could improve the capacity of surface irrigation systems in Old lands in order to overcome the negative impacts of climate change.
69. The vulnerability of Egypt's water resources to climate change entails those affecting Nile flows (hypersensitivity to Ethiopian rain; sensitivity to temperature increase in equatorial lakes and Bahr El Ghazal, and uncertainty due to significant differences in the Global Circulation Models output of water flow into the Nile), rainfall (the possibility of a 50% reduction of rainfall on Egypt's Mediterranean coast), and ground water (increased levels and salinity due to sea level rise and consequent sea water intrusion). Different ideas are being considered for the adaptation to the reduction of water resources or the increase of Nile flows. These primarily include: keeping the water level in Lake Nasser low; increasing water storage capacity; improving irrigation and draining systems; changing cropping patterns and farm irrigation systems; reducing surface water evaporation by a redesign of canal cross section; developing new water resources through upper Nile projects, rain harvesting, desalination, wastewater recycling, increased use of deep groundwater reservoirs; and using a number of soft interventions such as increasing public awareness about the need for rational use of water, enhancing precipitation measurement networks in upstream countries of the Nile Basin, encouraging data exchange between Nile Basin countries, and developing Circulation Models for the prediction of the impact of climate change on the local and regional water resources.

III. Baseline Analysis

70. In 2011, the GOE has prepared a *National Strategy for Adaptation to Climate Change and Disaster Risk Reduction* aiming at increasing the adaptive capacity of the Egyptian communities to deal with climate-related risks and reducing impacts on vulnerable sectors (coastal development, water resources and irrigation, agriculture, health, urban, tourism, housing and roads). The Strategy assesses the impacts of climate change in these sectors, indicates a set of adaptation and risk reduction measures per each sector (Table 3), proposes an operational framework for the CC adaptation programme, and estimates the anticipated costs for adaptation.

Table 3. Adaptation measures for the agriculture sector proposed in the National Strategy for Adaptation to CC and DRR (2011)

Issue	Adaptation Measure
Low flow of the river Nile ³⁹	<ul style="list-style-type: none"> • Rational use of available water resources. • Launching a national awareness raising campaign about water. • Improving the distribution network (pipes, valves, tanks, etc) to reduce losses caused by leakage and storage. • Recycling treated wastewater.
Maximum utilization of rainfall and flash flood water ⁴⁰	<ul style="list-style-type: none"> • Expand construction of dams and reservoirs for rainwater collection, including underground reservoirs. • Use modern techniques in the field of water harvesting, such as remote sensing and GIS, to analyse the geo-morphological and soil properties of flood prone areas.

³⁹ These measures are included in the 2005 National Water Resources Plan (NWRP).

⁴⁰ Rainfall in Egypt is characterized by its instability and scarcity from one year to another, accompanied by extended dry intervals as well as agricultural and pastoral farming problems. This instability could denote a wave of flash floods with devastating and undesirable environmental and social impacts. The total amount of rainfall and flash floods that could be used annually is estimated at around 1.3 billion cubic meters. This quantity can be increased to 1.5 billion cubic meters upon taking the referred measures.

	<ul style="list-style-type: none"> • Mapping flash flood risk areas and plan appropriate precautionary measures.
Building an effective and flexible institutional system for crisis and disaster management	<ul style="list-style-type: none"> • Strengthening the capacity of monitoring, forecasting, analysis and dissemination, in current and reclaimed agricultural areas, through the creation and installation of monitoring stations for climate impact indicators on agriculture productivity (e.g. temperature, greenhouse gases, relative humidity, change in groundwater quality, change in organic and inorganic nutrients content of the soil, intrusion of sea water into the Delta lands, and others). • Building dynamic expert systems to provide information, analysis and recommendations on any climate change indicators related to agricultural productivity for the farmers, decision-makers, specialists, researchers and the general public.
Increase the capacity of the agriculture sector to make effective use of genetic diversity to maintain production under CC projections	<ul style="list-style-type: none"> • Strengthening programmes aimed at improving the capacity to introduce new crop/animal varieties and preserve genetic diversity. • Estimate the CC impacts and adaptive potential of the different crop/animal varieties, to expand the genetic diversity and varieties that are available to farmers. • Strengthening the capacity of the National Genes Bank.
Overcome productivity shortfall problems due to CC projections	<ul style="list-style-type: none"> • CC risk assessment of the plant production sector. • Introduction of breeding programs for crop plant varieties that are capable of adapting to the expected changes in climate indicators (e.g. T increase up to 2 °C; high soil salinity; reduction of on-farm water up to 50%; resistance to insect diseases; resistance of new microbiological and pathological species likely to spread with increased humidity, and higher rates of evaporation and temperature; etc). • Improvement of monitoring and mapping of plant diseases and their causes, their prevalence in different agricultural environments and major crops as a result of changes in climate indicators. • Strengthening plant protection programs to follow up on the changes in the biological diversity (species and varieties) of insects, and its association with trends in the relevant climate change indicators. Identifying how to maintain a positive balance, which benefits agricultural production in different environments. • Development of new varieties of crops with short growing seasons to reduce their water requirements. • Expansion of cultivation of crops of economic importance, which can adapt to CC, making use of new adaptive farming systems and technologies, especially as far as water saving and efficient use. • Gradual modification of agricultural policies every five years, in order to adjust to the climate forecasts.
Increase soil ability to neutralize the expected changes in climate indicators	<ul style="list-style-type: none"> • CC risk assessment of agriculture soils. • Building an integrated information system for agriculture land (e.g. mineral and biological fertility, topography, hydrology, climate elements, uses, etc). • Increase the content of soil organic matter, which strengthens resilience to flooding and drought. • Implement soil amelioration programmes based on reducing salinity and promoting aquaponic systems in the Delta area.
Improve water use efficiency under a CC scenario of increased water requirements for on-farm irrigation	<ul style="list-style-type: none"> • Promote breeding programmes for plant varieties supporting low soil water content and salinity. • Enhance the use of efficient irrigation techniques based on precision farming. • Increase soil organic matter to improve its ability to retain moisture.
Improve livestock production under CC	<ul style="list-style-type: none"> • CC risk assessment of impacts in livestock production. • Promote livestock breeds with higher adaptability to CC indicators. • Mapping animal pathogens changes associated with CC indicators and development of prevention and immunization programmes to reduce impact on dairy and meat productivity. • Support and develop of serum and vaccine technologies and industry for diseases expected to spread with CC indicators. • Improve fodder crops and varieties as a source of energy, fiber and protein.
Enabling conditions supporting the agriculture economic system	<ul style="list-style-type: none"> • Policy improvement on food security and crops combination, insurance systems against CC risks, agro-industry and marketing of agriculture products and price forecast. • Capacity development of rural communities to participate in decision-making about adaptation needs, in the development and implementation of national adaptation and risk reduction policies, and in the adaptive management of agriculture resources through a multi-stakeholder approach.

71. The SNC Recommend the following CC adaptation priorities for the agriculture sector:

(i) Conducting a national program for improving the current crop patterns and calendar to be adapted to the incoming projected climate changes. This program should include developing and testing heat, water, salinity and plant pests and disease stress-tolerant cultivars of the major

crops. Dissemination of the results to the farmers should be one of the important objectives of this program.

(ii) Implementing a nationwide project targeting the improvements of on-farm irrigation systems in order to tackle the expected increase in pressures on water availability and the higher irrigation demand under climate change conditions.

(iii) Assuring sustainable adaptation funds and climate hazards insurance systems. The current scientific and social evidence reveals that there are strong needs to develop special fund program for adaptation activities in the agriculture sector (Medany et al., 2009). The size of this fund and the local allocation of the program activities should be relative to the vulnerability levels of the local agricultural regions.

(iv) Establishing a strong information dissemination system regarding climate change and its impacts on agriculture targeting all growers, in order to assist them in developing appropriate adaptation measures.

72. For designing an adaptation strategy for the agriculture sector, the SNC proposes to consider simple and low cost adaptation measures, which may be inspired from traditional knowledge, meet local conditions and be compatible with sustainable development requirements. The following considerations should be included to enhance the planning of adaptation and mitigation strategies: improving scientific capacity; using a bottom-up approach for adaptation planning; developing community-based measures for stakeholders' involvement in adaptation planning; increasing public awareness about climate change; improving adaptive capacity of the community (MALR, SADS 2030).

73. Sectoral Policy Briefs to CC adaptation (e.g. Agriculture Sector, Water Sector) have been prepared in the framework of the CC Risk Management Programme in Egypt, with funding from the MDGF. The Agriculture Sector Policy Brief addresses the key challenges facing the agriculture sector, including CC impacts, and proposes a Climate Change Adaptation Policy Framework (CCAPF) outlining a set of principles, policy recommendations, roles and responsibilities, coordination mechanism, monitoring and evaluation, and financial resources needed to guide the different stakeholders' engagement in implementing agriculture-related CC adaptation.

74. CCAPF recommendations related to crop production are:

- Generalization of the use of higher quality certified seeds to increase up to 20% in crop yields;
- Promotion of high-yielding early maturing cultivars, more heat-tolerant, salinity-tolerant, and water stress resistant crop varieties;
- Adapting current cropping patterns to CC conditions and optimal use of water, including reduction of crops with excessive irrigation requirements;
- Adaptation of crop farming practices and management systems (e.g. changing sowing dates, changing crop varieties well adapted to agro-ecological conditions, changing farming systems supporting soil & water conservation, and changing irrigation techniques) to increase productivity at rates between 25-40% more;
- Promotion of value added of farm residues and by-products for organic fertilizers, soil mulching, or animal feed (it is estimated an amount of more than 25 million ton of crop residues in the agriculture sector);
- Application of integrated pest management (IPM);
- Raising farmers' awareness about the importance of proper use of water resources and good agriculture practices (GAP);
- Adopting a water conservation culture through: (i) Renovation of mesqas and marwas through cement coating and converting to pipes to reduce water losses; (ii) water-saving on-farm irrigation systems, such as drip irrigation in fruit trees and vegetable fields (water use efficiency is expected to increase from 45% up to 80%, saving about 35% of irrigation water used or 13 billion m3 in old lands); (iii) water recycling, water desalination; (iv) rainwater harvesting and groundwater recharging;
- Scheduling irrigation on the basis of crop water requirements determined through accurate measurements and models to improve the efficiency of both water application and agronomic water use efficiency;
- Support and develop early warning mechanisms.

75. CCAPF recommendations related to livestock production are:

- Specialized field veterinary service supporting smallholders to improve cattle breeds through artificial insemination programme, pregnancy diagnosis and sexual health control;
- Awareness campaign aiming to promote farmer's acceptance for cross breeds;
- Innovative techniques supporting cooperatives in fodder production: (i) high yielding certified clover seeds; (ii) crop residues and by-products; (iii) hydroponic barley fodder; (iv) saline water for fodder production; (v) integration of livestock into farming systems;

- Conducting a national project to select the best livestock breeds adapted to CC and limiting GHG emissions.
76. The Ministry of Water Resources & Irrigation (MWRI) has adopted in 2013 a national strategy of adaptation to CC, assessing water resources, demand, quality and management in Egypt, providing CC projections on the water sector, identifying adaptation measures, and proposing guidelines for mainstreaming CC adaptation in the water sector. However, there has not been neither a thorough consultation process with the various partners nor a potential approval of the strategy.
 77. The programmes and sub-programmes for the execution of the *Sustainable Agricultural Development Strategy toward 2030* (SADS) include the need to monitor and implement adaptation measures to climate change, with specific reference to: (i) rationalizing and upgrading of the efficient use of water in agriculture; (ii) maximizing the use of soil microorganisms and improving soil organic matter and fertility through adaptive agronomic technologies; (iii) promoting drought-, saline- and pest-tolerant crops and varieties; adopting early-warning and climate-risk prediction systems; (iv) implementing research to find locally-adapted solutions to climate change impacts in terms of agronomic systems, technologies, crops and varieties; (v) developing animal production systems that reduce methane and nitrate emissions; (vi) raising the capacity of the agriculture sector to adapt to climate change, concentrating on the most fragile territories and population.
 78. In particular, the SADS aims to achieve the sustainable use of agriculture natural resources through: (i) A gradual improvement of the efficiency of irrigation systems to reach 80% in an area of 8 million feddans, and to reduce 22% the areas planted with rice by 2030 in order to save about 12.4 billion m3 of water; (ii) Improving field irrigation conveyance system in reclaiming additional new areas estimated at 1.25 million feddans by 2017 and about 3.1 million feddans by 2030; (iii) Increasing the economic efficiency of the water unit by 119% and the economic efficiency of the land unit by 74% by 2030; (iv) Improving water harvesting techniques adapted to maximize rainfed water use and supplementary irrigation from groundwater sources; (v) undertaking periodical soil surveys as a basis to establish fertilizer rates, restore and maintain agriculture drainage systems, and install new drainage systems where necessary; (vi) create about 4 million new jobs and provide the necessary skills for the younger generation through reclamation of new areas, improvement of irrigation systems in old areas, adoption of labour-intensive technologies, and expansion of agriculture-support activities in the areas of production, marketing and agro-industries.
 79. The SDAS aims to achieve the improvement of agriculture productivity objective through: (i) planting newly developed varieties resistant to drought, salinity and pests, and early maturing crop varieties; (ii) increasing clover productivity; (iii) developing long-medium staple cotton varieties with high economic returns; (iv) promoting integrated farm management, improved cultural practices, and bio-technology to improve yield/feddan by 2030 in cereal crops (3.6 t for wheat, 5.2 t for rice, and 5 t for maize), sugar crops (65.4 t for sugar cane and 35 t for sugar beet), fiber crops (1.8 t for cotton), fruit crops (15 t for citrus, 14 t for grape, 10 t for mango), and vegetable crops (30 t for tomatoes, 14 t for potatoes); (v) increase per capita animal protein consumption by 4 g/day by 2030 through: an improved production of cattle and buffalo milk to achieve an annual per capita share of 90 kg; a modernize poultry sector; sustainable development of the lake fisheries production and expansion of the sea fisheries production and aquaculture.
 80. In terms of increasing competitiveness of the agriculture products in local and foreign markets, the SADS will focus on: (i) supporting the quality improvement of agriculture products; (ii) establishing and applying quality standards, and expanding application of sorting, grading and packaging processes; (iii) applying information and telecommunication modern technologies; (iv) improving marketing facilities and services; (v) improving pre- and post-harvest practices for product quality improvement and marketing efficiency; (vi) applying modern techniques in monitoring, analyzing natural and market risks, and developing risk mitigation measures; (vii) improving value chain linkages.
 81. In terms of achieving higher rates of food security in strategic goods, the SADS will focus on: (i) increasing self-sufficiency from 54% to 81% for wheat, from 53% to 92% for maize, from 77% to 93% for sugar, from 67% to 93% for red meat, and from 97% to 99% for fish by 2030, through development programmes, institutional reform and the introduction of new policies; (ii) application of new policies and programmes to improve nutritional standards and dietary patterns; (iii) application of policies and programmes to improve marketing efficiency, increase agro-industries and reduce pre- and post-harvesting losses to half their present levels; (iv) updating food standards and enacting necessary laws and control arrangements to enforce standards and improve consumer safety measures.

82. In terms of improving opportunities for agriculture investments, the SADS will focus on: (i) reviewing laws and procedures for land allocation and the issuing title deeds; (ii) enabling farmers and agriculture investors to use the areas allocated to them as bank collaterals; (iii) reviewing credit policies for agriculture projects and streamlining lending procedures; (iv) mapping agriculture investments, defining areas assigned to the different types of investments.
83. In terms of improving livelihood of rural inhabitants, which is the core of the SADS, the strategy will focus on the introduction of a number of policies and work programmes to expand newly-reclaimed areas, encourage job creation through the establishment of integrated agro-industrial communities, handicrafts and small rural industries, maximize farmers' utilization of agriculture residues, promote and support small farmers' associations, particularly in the field of marketing, and promote the role of women in the different rural development areas.
84. Additionally, there are some strategic documents addressing climate change adaptation needs for Egypt:
- The "Egypt's gender and CC national strategy" developed by CEDARE in collaboration with the International Union for Conservation of Nature (IUCN). However there has not been a thorough consultation process with the various partners.
 - The Participatory Development Programme (PDP)/CC Adaptation and Resilience in Informal Urban Area, led by The German Cooperation Agency (GIZ) which initiates a very interesting adaptation to CC initiative.
85. All these initiatives contribute to draw the outlines of a national vision for adaptation to CC. Nevertheless, there is no national strategy/program/plan of adaptation to CC in Egypt through addressing adverse effects of CC and increasing climate resilience. With reference to the 2ndNC, the brief assessment of the vulnerability was followed by a proposal for a set of measures of adaptation to CC for each sector: agriculture, water resources and Nile Delta. The proposed adaptation measures need to be further developed and more argued.
86. For on-farm irrigation systems in Egypt, figuring out adaptation strategies is a high national priority. The current national plan for improving on-farm water management is an ambitious plan targeting 2 million ha in ten years. The implemented plan will increase irrigation efficiency by 50 to 75%, which is equivalent to water needs for reclaiming about 1.21 million ha.
87. The MALR and the MWRI set an integrated plan for land reclamation through several large projects targeting about 1.4 million hectares to be reclaimed by 2017. This plan probably includes a set of steps towards the adaptation to CC and the improvement of the CC resilience of the neediest farmers that are the most vulnerable to climate hazards. In terms of innovative initiative, the SEKEM⁴¹ Holding supports farmers in a whole agriculture integrated model. This is a new holistic development model through self-economic support agriculture. Actually, further studies on vulnerability, and adaptation to CC and their impacts are still needed in the agriculture sector. Some barriers still exist, including limited scientific information; policy perceptions; poor adaptive capacity and lack of financial support. Moreover, synergy between agriculture and water resources through a food security inclusion approach may constitute an interesting initiative for the adaptation to CC to enhance resilience to climate hazards of most vulnerable rural populations.
88. IFAD is a small donor in Egypt in terms of the volume of financial assistance it provides compared to others. However, its assistance is highly valued by the GOE and has been targeted very strategically to the agriculture sector and the smallholder farmer in particular. IFAD's programme in Egypt has comprised two main themes and groups of activities: support for settlement in lands reclaimed from the desert in northern (Lower) Egypt, and support for productivity improvement in old lands in the Nile Valley and Upper Egypt. IFAD prides itself for being the first donor to recognise the plight of the smallholder settlers on the new lands in Egypt. IFAD is the sole donor implementing projects in the new Lands. IFAD interventions have already covered some 65% of the new lands and with the GEF baseline SAIL this ratio will be improved to 87%.
89. The scope of IFAD grants programme has been broadened to include in addition to agriculture technical issues, gender mainstreaming, the development of knowledge-sharing networks, promotion of microfinance for the rural poor and institutional capacity-building. While the small farmers, including both men and women, have been the central focus of IFAD's projects, the off-farm rural sector has also been gradually added to its ambit in recognition of the growing diversity of rural livelihoods. At a time when the importance of agricultural growth has been acknowledged as being critical for growth in national income, food security, employment and reduction of poverty

⁴¹ Using biodynamic agricultural methods, desert land was revitalized and a striving agricultural business developed. Over the years, SEKEM became the umbrella of a multifaceted agro-industrial group of companies and NGOs. Today, SEKEM is regarded as a leading social business worldwide. (Source : www.sekem.com/History).

in Egypt, the role of the small farmer is recognised as instrumental in contributing to this growth. IFAD believes that its comparative advantage lies in continuing to work closely with the smallholder farmer, the small rural entrepreneur, women and youth in rural areas. IFAD investments are focused on those aspects, which cater to the needs of the smallholder such as organizing smallholders, on-farm water management, access to micro-finance and linkages to markets in a manner, which addresses the need of the small producer.

90. IFAD projects have benefited 1.3 million households or 7 million people and covered 447,000 feddan (188,000 ha). The impact of IFAD investments on the new land is immediately evident and was very well captured in the completion report of the very first IFAD project in Egypt. The Completion Report of the West Beheira Settlement Project (WBSP) assessed that the project had succeeded in establishing a viable farming community complete with needed infrastructure, potable water, electricity, roads, sewage disposal system and housing for the settlers. The provision of good quality irrigation water, rehabilitation of the irrigation network and provision of drainage, transformed the productive potential of the project area. The 2004 Country Programme Evaluation, the completion reports of projects completed in 2008 and the impact evaluation from West Noubaria (2013) report unprecedented increases in yields on the new lands and substantial increases even on the old lands for wheat, maize, rice, alfalfa and vegetables. In most cases, the increase in yields has surpassed the Staff Appraisal Report estimates indicating much higher rates of return than projected at appraisal. Cropping intensity and crop diversification was also reported to have increased for most projects with agricultural components. Of course, not all of this increase can be attributed to project interventions alone. A survey of adoption rates of new technologies by farmers for a few major field crops implemented by the Agricultural Production Intensification Project (APIP) showed adoption rates of above 80% for important practices for cotton, maize and wheat in Fayoum.
91. More recent analysis of its on-going projects shows that IFAD has broadened its partnerships in the country to include the private sector and has made good progress in organizing FMAs, and connecting them to markets through contractual arrangements with the private sector. This has had an immediate impact on farmer profitability and incomes. In addition, the availability of financial services for on-farm investments in modern irrigation technologies has helped to substantially increase yields while reducing production costs. The impact study of the West Noubaria Rural Development Project (WNRDP) showed that, as a result of IFAD's intervention, (i) settlement rate increased from the initial 25% to 100% by the end of the project period; (ii) average annual household income had increased fourfold reaching US\$8,300; (iii) an increase in farm-gate prices of up to 33 per cent; (iv) decreases in irrigation costs by 25 per cent, through enhanced managerial capacity of water groups and conversion from diesel to electric pumping, and promotion of modern irrigation systems; (v) 50-per-cent decreases in fertilizer use through drip irrigation – and 75 per cent when combining organic manure and chemical fertilizers with drip irrigation; (vi) registering and supporting 6 Farmer Associations with a total membership of 30,570 members, and covering a total of 94,958 ha; (vii) the establishment of collection centres and (viii) promoting contract farming, through implementation of 63 different contracts, covering an area of 5,884 ha with Global Gap certification.

IV. Stakeholders Analysis, Target Group and Project Area

a. Stakeholder analysis

Rural Population

92. Men and women small-holder farmers: The small-holder farmers in the new settlements typically own between 2.5 to 5 feddan, such as in Lower Egypt and Upper Egypt, though in Middle Egypt there is a greater variation with more farmers having larger land holdings up to 30 feddan, as the old graduates had received larger parcels of land from the government. Most farmers own some livestock with the majority of households keeping poultry. The diversity and number of small and large ruminants increases with size of land holdings. The productivity of land and animals is low, thus even those households with larger parcels of land are still in the category of the poor. The availability of water for irrigation is a challenge due to several factors including shortage of water, poor condition of irrigation infrastructure, high cost of gasoline to run pumps, limited capital to invest in drip irrigation which costs about EGP 4000 to EGP 5000 per feddan. Poor knowledge about modern production practices, limited access to agriculture and livestock extension services and lack of capital translates into low agriculture productivity and high rates of animal morbidity and mortality. Farmers do not have access to credit through formal institutions and live in a continuous state of debt to middle-men and traders of inputs. Returns from agriculture are low with considerable variation in price of farm produce and high post-harvest losses. As a result of the multiple challenges they face, farmers said they feel like 'fighters' not farmers. Men and women are predominantly involved in farming but often have to supplement their incomes through

off-farm jobs or daily wage labour. Since the typical household is large, one or two of the young men tend to work off-farm.

93. Women: Women in the new settlements often lack the social networks of support that provide the critical coping mechanism for poor households. Women's literacy levels tend to be low with high levels of illiteracy in some villages. However, there are villages with women who have secondary education. In many settlements women suffer because of low levels of education, early marriages, multiple pregnancies, limited or no access to skilled birth attendants, limited mobility, and highly limited opportunities for off-farm employment. Women have virtually no opportunities for employment both due to cultural constraints as well as unavailability of employment options. Even when women have high school or graduate degrees they are unable to find any productive employment. The majority of women, but not all, are actively involved in agriculture in most villages. However, there are some villages where women are only minimally involved. All women are heavily burdened with domestic tasks and involved with most of the tasks on the farm including both crop and animal husbandry. Farm activities include planting, weeding and harvesting of crops. Women perform eighty to ninety per cent of the tasks related to animal husbandry such as fetching and chopping fodder, feeding and watering the animals, milking, looking after the young animals at birth, grazing and cleaning. Milking, making butter, cheese, are also considered women's tasks. Some women are also involved in selling milk and at times animals at the farm gate but men predominantly make decisions about buying and selling animals. Care of rural poultry is almost exclusively the responsibility of women and they are able to keep the income from the sale of eggs and birds. Children, in the villages visited, were also seen to be suffering from malnutrition. Women are keen to participate in community activities, engage in enterprises such as bakery, tailoring, fruit processing, kitchen gardening, livestock and poultry keeping, improved agricultural practices and to find other employment opportunities.
94. Young women and men: Young women and men face challenges in accessing education, vocational training and opportunities for recreation. Unemployment among young men is high in most of the villages and they do not have many skills. They work as farm labour during peak seasons and seek work elsewhere in the country. Those who have intermediate school certificates work in restaurants, in cafes, in shops and those who are illiterate mainly work in construction and as casual labour in Cairo and other major cities. There are services required in the villages that could provide employment opportunities for them such as tailoring, barber shops, engine repairing, car mechanics, plumbers, electricians and carpenters and woodworks. However, no vocational training is available to them as the cost of accessing training in cities is prohibitive for most and they lack the capital required to start-up a business. In addition, the villages lack any sort of recreational facilities for youth. Substance abuse among young men was reported during field visits. Opportunities for young women are even more limited due to lower levels of education, early marriage, household responsibilities, and cultural barriers such as restrictions on their mobility. Spaces for young women to socialize together are even more limited than for young men. There are some opportunities for village-based enterprises such as tailoring, small shops for women's clothes, raising livestock, food processing, post-harvest activities, etc.
95. Women-headed households: Women-headed households are present in every village, with one of the target villages in Upper Egypt, Samaha, comprising exclusively women-headed households. Among women-headed households, the poorest are those with no male earning member. These households rely on charity, the bread subsidy from the government and earning from casual labour in agricultural fields. Some rely on child labour. Other households are temporarily women-headed as the male members work in other cities and these rely on remittances.

Governmental Institutions and Organisations

96. MALR is the responsible central agency for agricultural development. MALR consists of sectors and departments for economic affairs, agricultural extension, agricultural services, land reclamation, livestock, and financial and administrative affairs. Furthermore, there are several institutions that affiliate to MALR, such as PBDAC and the Agriculture Research Centre (ARC). In addition to MALR, the MWRI that is responsible for managing all water bodies in Egypt. In addition to these two central institutions, there is another set of central institutions that indirectly affect the agricultural sector. This set of institutions includes the Ministry of Electricity and Ministry of Petroleum as they are responsible for the energy need for economic and social development. The Ministry of Defence indirectly affects agricultural development, as it has the upper hand in controlling desert land, and thus controlling land reclamation. The Ministry for Local Development (MLD) is another central body that is involved in rural development. MLD includes the ORDEV, and the Fund for Local Development (FLD).
97. The Agriculture Research Centre (ARC) is the main body responsible for applied research in Egypt. ARC main objective is to achieve sustainable development through the implementation of modern technology which will attain the suitable use of agricultural natural resources, fulfil the people

needs and requirements and improve the farmer's income. ARC is a semi-autonomous research institution governed by a board of directors chaired by the Minister of Agriculture. The ARC comprises a well-distributed network of 16 institutes, 8 central laboratories, 10 regional stations and 46 specific research stations, 23 research administrations, 4 research extension and training centres to cover all agro-ecological zones of Egypt. Moreover, research and agricultural experiments stations are distributed throughout six regions, they are: North Delta, Central Delta and Greater Cairo, West Delta, East Delta, Middle Egypt, New Valley and El-Fayoum, and Upper Egypt.

98. The Central Laboratory for Agriculture Climate is part of ARC, and consists of four research departments, namely: Agro-meteorological Application Research Department (AARD); Soilless Culture Research Department (SCRD); Biological Agriculture Research Department (BARD), and Climate Modification Research Department (CMRD). The major objective of CLAC is to establish an agro-meteorological network covering the agricultural area including both old and newly reclaimed areas. It also aims at conducting research and training related to different application of daily weather data on current and near future agricultural activities. This includes utilization of mathematical models to estimate daily water requirements, fertilization, pest and disease forecasting, chilling and heating unites and other crop management practices.
99. The Egyptian Environmental Affairs Agency (EEAA) has the responsibility of implementing national environmental policies and of setting up environmental standards for cases of conflicting interests. In this respect, the Agency established inter-ministerial committees on each of the major relevant crosscutting environmental issues, such as water, energy, and climate change. These are chaired by the Minister of State for Environmental Affairs, and coordinate between multiple competent authorities for the different specific environmental processes of concern.
100. Prime Minister renewed the "National Committee for Climate Change" that established in 1997 by his Decree No. 272 in 2007. The Minister of environment heads the new Inter-Ministerial National Committee for Climate Change. The members represent a wide range of governmental, experts and non-governmental stakeholders. Recently, Ministry of State for Environmental Affairs scaled up the "Climate Change Unit" to strengthen climate change institutional framework on the national level, to become a Central Department in Egyptian Environmental Affairs Agency in 2009. Meanwhile, on the sectoral level attempts to strengthen the institutional framework led to establishing two committees in Ministry of Agriculture and Land Reclamation and Ministry of Water Resources and Irrigation, in addition to establishing a climate change information centre for Agriculture Sector, and conducting an adaptation program in Agriculture Sustainable Development Strategy up to 2030.
101. The Egyptian Environmental Affairs Agency (EEAA) has the responsibility of formulating and implementing the national CC policy. In this respect, the agency established inter-ministerial committees on each of the major relevant crosscutting environmental issues, such as water, energy, and CC. The Prime Minister renewed the "National Committee for Climate Change (NCCC)" established in 1997 by his Decree No. 272 in 2007. The State Minister of environmental Affairs heads the new Inter-Ministerial NCCC composed by a wide range of governmental, experts and non-governmental stakeholders. Recently, the MinSEAF scaled up the "Climate Change Unit" (CCU) to strengthen CC institutional framework on the national level and to be a Climate Change Central Department (CCCD) in EEAA in 2009. The CCCD includes three Departments i) mitigation & CDM, ii) Vulnerability & adaptation and iii) Technology & Research. Meanwhile, attempts to strengthen the institutional framework on the sectoral level led to establishing two committees in MALR and MWRI, besides establishing a CC information centre for agriculture sector, and conducting an adaptation program in agriculture sustainable development strategy up to 2030. Unfortunately, the EMA has a very limited contribution to the CC national dialogue.
102. The Egyptian Meteorological Authority (EMA) is responsible of systematic observations and meteorological forecasting. The country-wide monitoring network consist of 116 stations including surface and atmospheric stations, air pollution, global radiation and agro-meteorological stations (EEAA, 2001). Among these, 26 were connected to international networks since 2001. The automatic network, in turn, has grown to 47 stations (2009). EMA focuses its activities on air quality and Nile River prediction. Products, especially weather predictions are made using simultaneously two developed models, MM5⁴² and WRF⁴³. Yet, it has limited capacities to generate climate information and products. Actually, the lack of legal framework partnership with civil aviation disables the EMA from providing its own resources. This reduces EMA influence at the national level as well their involvement at the CC national dialogue.

⁴² The MM5 (short for Fifth-Generation Penn State/NCAR Mesoscale Model)

⁴³ WRF : Weather Research Forecast

103. Besides the EMA, other organizations handling climate observation data do exist in Egypt. For instance, the Ministry of Agriculture and Land Reclamation (MALR) which holds 26 agro-meteorological stations in addition to two environmental stations. However, most of them need substantial calibration and maintenance. Similarly, the Central Laboratory for Agricultural Climate (CLAC) has, also, 55 agro-meteorological stations managed independently. Furthermore, the CLAC has even developed, in collaboration with EMA, a weather forecasting system.

Civil Society

104. Civil society in Egypt seems to be more aware of the adaptation to CC issue and is highly diverse:
- The Arab Network for Environment & Development (RAED), based in Cairo, which is a network of NGOs from the Arab region. RAED is characterized by its ability to mobilize civil society in the Arab region and by organizing regional workshops. In addition, RAED is a member of the H2020 consortium.
 - As well NGOs having meaningful activity in environment protection which may be involved in the adaptation to CC at the community level and the local scale. One can note the Egypt Bio Dynamic Association (EBDA) which collaborates with the SEKEM on an innovative topic with a cultural challenge namely the introduction of the organic agriculture.
105. At the regional level, the CEDARE based in Cairo, is involved with a good capacities to develop regional studies but with average skills to reach policy makers, parliamentarians and politicians in the Arab region.
106. The *Sekem Development Foundation* was founded as an NGO that is running various education, and vocational training centres, a medical centre and development projects. SEKEM has identified biodynamic agriculture as the competitive solution for the environmental, social and food security. They cultivate their own Biodynamic farms and helped with the establishment of the Egyptian Biodynamic Association for sustainable agriculture (EBDA) with more than 700 farmers in Egypt shifting from conventional to Organic agriculture. Various companies have been established in the field of agriculture and cattle management, phyto-pharmaceuticals, organic textiles and clothes and organic food and beverages (market leader in Egypt). Furthermore, SEKEM established the Heliopolis University for Sustainable Development, which successfully started its operations in the year 2012, responding to the challenges of climate change, resource scarcity, growing population, extreme poverty and food security. SEKEM has acquired new plots of desert land (total area of 6000 feddan = 2.520 hectares), with the aim to establish model farms proving that Biodynamic agricultural methods are the best option for Egypt in desert land reclamation.
107. Some NGOs were established to defend the interests of a group of individuals and companies, such as Union of Producers and Exporters of Horticultural Crops (UPEHC), and the Horticultural Export Improvement Association (HEIA). Coptic Evangelical Organisation for Social Services (CEOSS) represents a different type of NGOs active in agricultural and rural development. CEOSS provides a system that allows communities to take the lead in their own agricultural advancements. NGOs include the agriculture cooperatives (ACs). The Union for ACs serves about five million peasants. The Union includes 14 central associations, such as Association for the Producers of Potatoes and Association for the Producers of Cotton; 22 Central Associations for agricultural credit; 18 Central Associations for Agricultural Land Reform (Eslah); 11 Central Associations for land reclamation. These associations serve constituents all over Egypt. Furthermore, there are agricultural associations that serve peasants at the village level. These associations reach about 5,856 cooperatives. At the District (Markaz) and Governorate levels, there are 222 and 124 centres, respectively. These associations organise their constituents in economic, social, cultural, and political spheres to raise the living standards of peasants and facilitate their participation in development at large through enabling and empowerment.

International Cooperation Agencies

108. The United States and the European Union are the largest providers of development assistance to Egypt with other major donors being the African Development Bank and the World Bank. The EU and US have both been active in the agriculture sector. USAID targeted economic reform, notably under the umbrella of its Agricultural Export and Rural Income (AERI) project. It has financed a range of agriculture sector activities including the establishment and development of Farmer Associations in Upper Egypt. As far as the EU is concerned, the Country Strategy Paper (CSP) drafted under the European Neighbourhood Partnership Instrument (ENPI) provided a strategic framework for cooperation between the European Union (EU) and Egypt for the period 2007-2013. EU's main priority objectives included political reform and good governance;

competitiveness and productivity of the economy. Combining the revolving funds made available under several EU projects to the agriculture sector, the MALR established the Agriculture Development Programme for providing financial assistance to the agriculture sector.

109. The World Bank, International Monetary Fund (IMF) and other multilateral donors have been pursuing an ambitious economic reform agenda in Egypt rooted in the privatization and restructuring of national institutions and services. For three decades, the Bank has been Egypt's principal development partner in irrigation and water management. The largely renewed irrigation system has contributed to increases in agriculture productivity and exports. Bank has also provided support to micro-enterprise development through support and access to rural finance⁴⁴. The World Bank has recently provided a USD 300 million loan to SFD for enhancing access to finance for the micro and small enterprise sector in Egypt. The IFIs have encouraged the government to introduce private sector participation into a number of sectors such as the railways, ports, and the water, sanitation, and irrigation sector. While Egypt has consistently received the highest proportion of IFI lending in the region, the past few years have seen a sharp increase in borrowing following Egypt's reclassification by the World Bank as a "middle income" country. Combined with its willingness to implement business-friendly reforms this has heralded a major influx of IFI lending to private companies investing in Egypt. The European Investment Bank in particular has significantly increased its involvement, becoming the largest multilateral lender in the country. Saudi Arabia's Islamic Development Bank Group (IDB) has also been providing resources to the country for investments in various fields.
110. Several bilateral donors are also operating in Egypt including the French, the Netherlands, CIDA, GTZ, etc., for the small and medium enterprise sector. While most have been working in the social sector, the environment and climate change, some are more closely involved with the agriculture sector. IFAD has been collaborating with several donors in the country. IFAD co-financed the West Nubaria Rural Development Project with the Italian Debt Swap funds and has in the past worked closely with the World Bank in Upper Egypt on rural development projects. IFAD, World Bank and the European Union are currently providing parallel financing to several partners such as the ADP and SFD.

b. Target Groups and Project Area

Target Area

111. The proposed area of the project will be selected from the sites that the Government has allocated for settlement and rehabilitation over the last 15 to 20 years. These lands are located in Upper, Middle and Lower Egypt. The Government has identified 97,971 feddan (41,147 hectares) spread over 30 settlements for selection in the proposed project. The GOE has made considerable investment in terms of housing, road infrastructure, primary and secondary canals and drainage infrastructure estimated at USD 250-300 million. However, in some areas, such as Kafr El Sheikh in Lower Egypt, where the land is suitable for agriculture, the progress of resettlement and land development has been slow due to the lack of the full range of social and economic services that are required for successful settlement. In other areas, the settlement is complete, but the productive potential has not been fully realised due to the limited capacity of the smallholder farmers to invest in the new lands, rural enterprises or diversify their livelihoods. The focus of this investment will be on the new lands, which have been slow to develop but could provide an important source of livelihood to poor and vulnerable households. Table 1 below gives a brief overview of the location and land area in each of the three selected regions.

Table 1: Project Area and Target Households

Area	Settlements	Registered Households ⁴⁵	Estimates of Actual Households ⁴⁶	Population ⁴⁷	Feddan
Lower Egypt	3	2,271	4,800	33,600	6,185
Middle Egypt	15	9,421	19,600	137,200	50,601
Upper Egypt	12	7,403	15,600	109,200	41,185
Total	30	19,095	40,000	280,000	97,971

Table 2: Names, locations and coordinates (center point) of IFAD's beneficiaries, new settlements in Upper Egypt, Middle Egypt and Lower Egypt

Area	Governorate	Villages	Coordinates
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⁴⁴ Egypt: Positive Results from Knowledge Sharing and Modest Lending. An IEG Country Assistance Evaluation. Independent Evaluation Group Knowledge Programs and Evaluation Capacity Development (IEGKE). 2009.

⁴⁵ Based on the official records of MALR.

⁴⁶ Based on the estimates of the socio-economic study and reports from the field visits of actual population.

⁴⁷ An average household size of 7 members per household has been estimated.

			Latitude	Longitude
Lower Egypt	Kafr El Sheikh	Sayed El Badawy; Talha; Ibrahim El Dessouky	31°31'2.77"N	31° 7'44.73"E
Middle Egypt	Beni Sueif	El Amany; El Tadamon; El Horriya	28°50'33.49"N	30°44'16.00"E
	Minia	El Gihad; El Aqdam; El Nasr; El Tawfik; El Feda; El Wafaa; El Etezaz; El Azeema; El Rakhaa; El Kamal; El Salam; El Amel	28°13'43.76"N	30°34'41.66"E
Upper Egypt	Wadi ElSaieda	Al Shahama; Amr Ibn AlAas; Al Iman; Al Samaha; Al Ashraaf; Al Nemou; Al Mostaqbal	25° 1'34.09"N	32°43'23.60"E
	Wadi ElNuqra	Al Amaal; Al Manar; Al Hekma; Al Baraem; Al Karama	24°26'31.57"N	33°15'7.37"E

Figure (2): Location of the project target areas: new settlements in Kafr El-Shaikh, Beni Sauif, Minia, and Aswan in Upper Egypt, Middle Egypt and Lower Egypt, respectively.



112. The agro-climatic features of the three target regions are:
113. **Lower Egypt** (Agro-climatic zone 1): The region features a hot desert climate, but prevailing winds from the Mediterranean sea greatly moderate the temperatures, making its summer moderately hot and humid while its winters are mild and moderately wet. The total area of this zone is 5379 km². The percentage of cultivated area to the total area is 75% in this zone. The value of evapo-transpiration for this zone is 3.76-3.77 mm/day, which equivalent to 1372-1376 mm/year. Using the previous value, the total annual irrigation amount needed to support the cultivated crops in an area of 4691 km² (cropped area) is 113754 m³/km² (Table 3). The main cultivated crops in this zone are wheat, clover, sugar beat, rice, cotton, maize, fruits and vegetables.
114. **Middle Egypt** (agro-climatic zone 5): With a hot desert climate, the region has the widest difference of temperatures between day and night of any area in Egypt, with almost 16 °C difference; winters are harsh and chilly cold and summers are very hot and dry. The total area of this zone is 4585 km²; with an 88% of cultivated area to the total area. The value of evapo-transpiration is 4.66-4.78 mm/day or 1701-1745 mm/year. Based on the previous value and the value of cropped area, an annual amount of irrigation water equal to 228750 m³/km² should be assigned to this zone. Because El-Kalubia is located near to the Greater City of Cairo, the main cultivated crops are vegetables and fruits with some field crops. The main cultivated crops in Beni Sweif and El-Minia are wheat, clover, faba bean, sunflower, cotton, maize, fruits and vegetables, in addition to sugarcane cultivated in El-Minia.

115. **Upper Egypt** (agro-climatic zone 8): The regional climate ranges from mild in winter to very hot in summer with absolutely no rain all year around (1-2 mm precipitation every 5 years). Both Assuit and Aswan are located in Upper Egypt. The total area of this zone is 26605 km², with only 8% of cultivated area. Therefore, to increase this percentage more land need to be reclaimed. The value of evapotranspiration is 5.86-5.92 mm/day or 2139-2161 mm/year. Based on the previous value and the value of cropped area, an annual amount of irrigation water equal to 139957 m³/km² should be assigned to this zone. The main cultivated crops are wheat, clover, faba bean, sunflower cotton, maize, sugarcane, fruits and vegetables in both governorates. Furthermore, medical plants are common in Assuit and palm dates are common in Aswan.
116. **Target Group and Gender Issues:** It is expected that the project will target around 40,000 rural households or 280,000 people in the new settlements as well as provide some support to the adjoining areas engaged with them for the provision of social and economic services. The number of households has grown considerably since the original land allocation as many of the settler families came with their extended families and other smallholders have settled in some of the adjoining lands. These are households who were displaced from their old lands due to the changing tenure arrangements in the country or young unemployed graduates who obtained agriculture and other degrees, but did not have an employment. In addition, to these two categories, other poor households have been forced to move to the new settlements due to the pressure on old lands. The target group for the project will be small farmers, graduate farmers, women and youth⁴⁸ who have moved to the new lands.
117. The profile of the target group is one of poverty, food and nutrition insecurity and vulnerability. While the men are mostly farmers, some are also engaged in various types of casual labour. Women who have moved here have limited opportunities to engage in productive work beyond the farm. There are some villages which are especially vulnerable and disadvantaged such as El-Samaha village comprising solely of widows and divorced women. The participation of women in agriculture depends upon the state of development of the new lands, the crops grown and the household's capacity to own livestock. Experience of West Noubaria tells us that women graduates, as well as women from small farmer households, play a critical role in the development of the new lands. Women are keen to participate in community activities, participate in opportunities for learning and engaging in enterprises such as baking, tailoring, fruit processing, kitchen gardening, livestock and poultry keeping and finding other employment opportunities, etc. There are virtually no facilities for the young in these new communities for higher learning, entrepreneurship, employment or recreation. Thus, the youth will be an important target group in the new project.
118. A strong community mobilization strategy will be put in place to prevent elite capture of community development associations (CDAs), agriculture cooperatives (ACs), water user groups (WUGs) and farmer marketing associations (FMAs). CDAs will be required to have a minimum of 50% women as board members⁴⁹. Youth CDAs will be created to ensure that young women and men's needs and priorities are not marginalized. Where women are interested in undertaking agricultural activities on a collective basis, such as post-harvest activities, sorting, grading, marketing of products such as herbal and medicinal plants, they will be assisted through establishment of separate cooperatives and market associations. Collateral requirements that will prevent poor women and men from accessing credit will be removed and credit made available through credit guarantees. Women will be recruited as community specialists, gender and youth officers, community resource persons and loan officers to ensure women have access to the range of services offered by the Project. Youth centers will be built in a culturally sensitive manner to ensure access to girls. As cultural norms in most villages do not allow the intermingling of young girls and boys, separate spaces will be created to ensure access for girls and young women to youth centres. The walls of the spaces for women will be higher to ensure that they have the privacy required for recreation.

V. PROJECT STRATEGY

(a) Project rationale and GEF added value

119. Agriculture represents one of the most complex and important human activities in Egypt and it plays a significant role in the Egyptian economy. It is not only important in terms of national income, but is also vital in terms of employment, food and nutrition security and reduction of poverty in Egypt. Moreover, agriculture plays an important role in the social structures of rural

⁴⁸ Defined in Egypt as those between 18-35 years old.

⁴⁹ The representation of women on the Board has been kept at 50 per cent based on past experience that the percentage specified is often interpreted as a cap rather than a minimum.

areas in Egypt, and it is responsible for social stability in these regions. Egypt enjoys a significant comparative advantage in the production and export of high value horticulture products including herbs and medicinal plants. This comparative advantage is based on its favourable agro-climatic conditions, off-seasonal production capabilities and physical proximity to important markets like the Gulf countries and EU countries.

120. There is a close interrelationship between growth in agriculture and poverty reduction in Egypt. Growth in the agriculture sector can reduce poverty as well as stimulate growth in the rural non-farm sector as farm income can drive demand for the large, employment-intensive, non-tradable, rural non-farm sector. The extra job creation allows underemployed labour to be absorbed or real wages to rise with a concomitant and rapid decrease in poverty.
121. There is a critical need in Egypt to expand new areas of growth and settlement to attract people from the overcrowded old lands and provide them an opportunity for productive growth and diversification of livelihoods. Land reclamation has been pursued as an important strategy for growth and development since the 1950s by successive governments and has been adopted to achieve four policy objectives: (1) enhance agricultural production – the historical motive for reclamation; (2) decrease population growth in the Nile Valley and the delta; (3) generate employment; and (4) alleviate poverty. In the new lands, the Government provides settlers with land at nominal cost (which they can pay over thirty years and obtain title) and rudimentary housing facilities. More recently the land has been given to unemployed graduates and smallholders displaced from old lands for various reasons.
122. Egypt is located in the arid region and is expected to be affected greatly by the adverse effects of climate change. Climate change will exacerbate the anthropogenic threats affecting agriculture production, namely the inefficient use of natural resources contributing to over-irrigation and salinity problems, the production losses due to lack of post-harvesting and marketing facilities, and the rapid population growth with higher pressure to convert agriculture land into urban areas which conflicts with the higher agriculture production needs.
123. According to the SNC (2010), climate change will most likely hit the rural communities severely due to their fragile socioeconomic conditions, their dependence on irrigated crops, a climate that is already too dry to support cropping systems, and the increasing water demands. The vast majority of crops in Egypt are irrigated from Nile water creating great vulnerability to reductions in the river flow. Furthermore, producing farmland in the Nile Delta faces the threat of inundation and salinization due to sea level rise of 12% to 15% of the most fertile arable land. Climate change also increases crop evapotranspiration with an effect in yield reduction, which is predicted to decrease up to 20% (e.g. barley, wheat, maize)⁵⁰. It will reduce the production of livestock and affect the productive potential of many agricultural zones in the country. The projected increase in temperature is expected to widen the gap between water resources and demands, decrease the overall agriculture productivity, and increase competition over natural resources. Analysts expect a 7% increase in irrigation demand by 2060, with the additional need to improve water efficiency in irrigation up to 75%. Crop water requirements of the important strategic crops are expected to increase by a range of 6% to 16% by 2100. The high vulnerability of on-farm irrigation systems in Egypt is attributed to low efficacy and irrigation management patterns. Vulnerability of crops to changes in pest infestation and plant diseases is another potential impact of climate variability in the Country⁵¹.
124. Based on the success of the West Nubaria Rural Development Project (WNRDP), the GOE has requested IFAD for assistance in mainstreaming climate change adaptation in agriculture development in the reclaimed lands, through institutional development and capacity building to help all concerned actors - from the national to the local level – incorporate adaptation and climate risk reduction into decision-making and operations, as well as through innovative investments and the provision of services to help farmers shift from maladaptive rural development practices into climate-resilient crop and livestock value chains.
125. The proposed project will assist the baseline SAIL supported households to increase agriculture profitability in the reclaimed lands, to select optimal cropping patterns with more water efficient crop types and varieties, and to make an optimal use of natural resources – water, soil, plant and animal species, renewable energy - to adapt the farming systems to CC predictions, ensure sustainability in natural resources management, and achieve the maximum net return per unit of water. This will be done by diversifying crop and livestock production, absorbing landless

⁵⁰ Sustainable Agricultural Development Strategy Towards 2030. Ministry of Agriculture and Land Reclamation, Arab Republic of Egypt, October 2009.

⁵¹ Egyptian Environmental Affairs Agency, 2014.

labour and youth, and creating opportunities for productive employment for women and contribute to poverty reduction, food security and gender equity.

126. Enhanced resilience to climate change will hence have close resonance with responding to water scarcity, increasing land productivity and livelihood diversification. Adaptation measures on the supply-side include ways to improve irrigation techniques and know-how, introduction of tolerant varieties, introduction of renewable energy alternatives, as well as improving post-harvest facilities. In addition, investments in improved climate-risk reduction and long-term forecasting of climate extreme events impacting agriculture and livestock production is essential to enhance Egypt's ability to cope with prolonged heat waves and other climate change related hazards⁵². The proposed project will make investments which address some of these issues to reduce the vulnerability of target communities to climate change, including a Dynamic Agriculture Information and Response System (DAIRS).
127. Many of the irrigation channels, drainage structures and pumping stations are functioning at low capacity due to poor maintenance. The SCCF project will support the adoption of renewable energy equipment as an additionality to the baseline SAIL support for rehabilitating the irrigation and drainage systems, fix the broken pumps in close collaboration and participation of water user groups, etc. Prior to these investments, the project will work with the Agriculture Cooperatives in establishing the WUGs, train their members in proper operation and maintenance arrangements including establishing of a mechanism for collection of funds, for purchase of any materials and payment to guards, maintenance staff, etc.
128. Given the CC projections about available water reduction and higher irrigation demand, the project will also capitalise upon the opportunity of introducing innovative water and energy efficient technologies. The project will scale up the successful experience of WNRDP in which farmers were given access to credit for the introduction of efficient irrigation systems (studies in West Noubaria have demonstrated a reduction by 38 to 50% of the water consumption by shifting from flood to drip irrigation depending of the crops). This will help in increasing the efficiency of water use, increase area under irrigation and make the distribution of water more equitable. The introduction of more efficient irrigation systems such as drip irrigation significantly reduces the quantities of water used by the farmers, and reduces salinization problems. To help reduce energy costs, the project will introduce solar energy pumps, solar panels for lighting among groups of farmers and introduce bio-gas technology. Empirical studies of the agriculture sector confirm that the enhanced utilization of new agricultural technology can play a crucial role in increasing total factor productivity, increasing labour and agricultural wages.
129. The project will make important investments in strengthening the baseline SAIL effort to increase the farmer's capacity to improve crop and livestock productivity through the piloting and dissemination of a number of adaptive agronomic systems and technologies, as well as crop types/varieties and livestock breeds. The project will build on a number of successful experiences on conservation agriculture, efficient irrigation systems, organic farming, soil-less hydroponic production, etc, implemented by IFAD and other partners in the reclaimed lands of Egypt, and in some neighbouring countries.
130. Various donor-funded programmes, including WNRDP, have proved that Agriculture Cooperatives (ACs) can be organized and trained to better manage irrigation infrastructure, farm equipment and undertake collective marketing activities. Agriculture Cooperatives can group to form Marketing Associations (MAs) with the capacity to engage in accessing better price for their produce through collective marketing by meeting Global-GAP and organic certification requirements. Besides they can become service providers for their members and exercise peer pressure among members to foster compliance with agreements, production practices and delivery schedules. In recognition of this fact, the Government has given considerable importance to establishing small producer organizations in its new Agriculture Strategy (SADS). The baseline SAIL project will provide significant support to ACs development that will integrate CC adaptation into decision-making and value chain development and investments – from production to post-harvesting, processing, product diversification and marketing – through the SCCF interventions.
131. The project will put in place participatory decision-making systems for CC adaptation planning and demand driven processes for building the adaptive capacity and strengthening all concerned actors, institutions and organizations. The proposed project will build on the successful experience of the WNRDP project in establishing and strengthening rural institutions especially Community Development Associations (CDAs), Agriculture Cooperatives and within them Water User Groups (WUGs) and FMAs. There is also need to improve the corporate governance of these rural

⁵² FAO, 2014.

institutions, strengthen their leadership, enhance transparency, and accountability. Investment in these rural institutions is instrumental given that the Government is planning to reform the agriculture cooperative law which will give them much greater flexibility to function as independent, farmer owned, profit-oriented organizations.

132. The project will focus in particular on women CDAs who are virtually excluded from the Agriculture Cooperatives, and youth who lack any type of institutional membership. The CDAs will be responsible for management of services such as literacy classes, basic health services, initiation of savings groups and provision of loans in areas where these services are missing and also engage the more enterprising youth in innovative opportunities for economic and social enterprise. The WUGs and MAs will be formed from within the Agriculture Cooperatives to assist in the operation and maintenance of irrigation infrastructure and engage in collective marketing in collaboration with the private sector. The experience of WNRDP with strengthening water users and market associations and helping farmers with contract farming with the private sector will be scaled up.
133. The project will capitalise upon the experience of some on-going regional grants to provide additional technical assistance and services to the target group in the newly settled lands. The proposed project will disseminate the research results financed through some regional grants to ICARDA⁵³ to demonstrate the experience with changing crop rotations for enhanced agriculture productivity to increase farmers' income, decrease soil degradation, build soil fertility and sustain crop production. The project will also use the results from an IFAD research grant to CLAC to test CC adaptation agronomic systems and technologies to enhance the adaptive capacity of rural communities to climate change⁵⁴. The project will also capitalize on the investments made by previous and on-going IFAD projects. The project will include, as an important resource, the farmer market associations established by the WNRDP and learn from the experience of the Upper Egypt Rural Development Project (UERDP) and the On-Farm Irrigation Development on Old Lands Projects (OFIDO) through country level workshops and exchange visits. The Promotion of Rural Incomes through Market Enhancement Project (PRIME) has only recently been initiated. Where opportunities exist for leveraging some of the financial resources from this project through SFD or ADP, this will be capitalised upon to provide additional financing resources to smallholders on the new lands.
134. The project has been proposed by Government and it is fully aligned with the COSOP's three strategic objectives, namely: (i) Improve the access of poor rural farmers to better quality services; (ii) Enhance the pro-poor sustainable use of natural resources, and; (iii) Strengthen the skills and organizational capacity of poor rural men and women to take advantage of rural on- and off-farm economic opportunities. The proposed project design was developed in close coordination with the Ministry of International Cooperation (MOIC) and the Ministry of Agriculture and Land Reclamation (MALR). The project supports the GOE's policy of integrated community development on the new lands, is aligned with the Government's Poverty Reduction Action Plan, its Sustainable Agriculture Development Strategy towards 2030 and its Water Resources Management Strategy (2009-2017), and responds to the priority measures for CC adaptation proposed in the SNC, the National Strategy for Adaptation to CC and DRR, CCAPF, and SADS.
135. IFAD's unique and incremental contribution to the agriculture and off-farm sector through this project will be a clear focus on its six principles of engagement. IFAD's focus on targeting will ensure that the poor rural people who have the capacity to take advantage of the economic opportunities provided by the new project include women, vulnerable households and unemployed youth. This focus is sometimes overlooked during implementation even if it is included in design. The project is especially designed to empower poor rural people in new lands, and will assist them in building their individual assets, knowledge, skills, collective organizations and assist women and youth as well as assist their organizations develop their skills and knowledge required to engage with markets. The project will be innovative in its strengthening of rural institutions, modern technologies, provision of marketing linkages and rural financial services. The project expects to catalyse effective partnerships between the smallholder farmers and the private sector and financial institutions.

Table 6. Baseline components and "with"/"Without" GEF interventions

SAIL Baseline Components	Without GEF Intervention	With GEF Intervention
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⁵³ Improving Livelihoods of Rural Communities in the Nile Valley and Sub-Saharan Africa Region: Sustainable Crop and Livestock Management".

⁵⁴ Improving smallholder farmer livelihoods in Sub-Saharan Africa Region through transforming research outcomes to create commercial opportunities. Options.

Component 1: Strengthened Smallholder Institutions	<ul style="list-style-type: none"> • 30 CDAs and 20 youth CDAs established and trained. • 99 Social infrastructure facilities rehabilitated/constructed (e.g. drinking water, clinics, schools, nurseries, youth centres, solid waste management and solar lighting). • 42 ACs and 5 FMAs formed and trained 	<ul style="list-style-type: none"> • 24,000 producers are trained on CC adaptation agronomic systems and technologies; • The members of at least 50 CDAs and CAs are trained on climate-resilient VC technologies; • 40 farmers (50% women) are trained as providers of services to support FFS and provide extension services to local farmers. • 4,200 members of WUGs are trained on optimal cropping patterns and efficient irrigation plans for selected VCs.
Component 2: Improved agriculture production and marketing reported by at least 24,000 smallholder farmers	<ul style="list-style-type: none"> • 17 pumps on lifting stations rehabilitated reaching 11,067 households (HH) and benefiting 29,026 feddans. • 50,000 meters of mesqas constructed and drainage system improved covering 4,800 HH and 6,185 feddans. • Drainage improved for 10,134 feddans benefiting 3,839 HH. 	<ul style="list-style-type: none"> • Irrigation schemes become climate-proof thanks to the adoption of solar water pumps and other modern technologies. • 7,000 feddans are irrigated with efficient micro-pressurized irrigation technologies. • 24,000 HH have access to climate-proof irrigation systems and technologies. • 22 hydroponic and aquaponic pilot farms are established. • 60% beneficiaries report improved production and marketing based on climate resilient technologies. • An early warning system (DAIRS) and weather stations are installed to monitor climate-risks.
Component 3: Improved employment and enterprises development	<ul style="list-style-type: none"> • 2000 people received vocational, income generation and enterprise training. • 12,000 smallholders (5,000 women) access agriculture loans for livestock and agriculture production and marketing. 	<ul style="list-style-type: none"> • 100 ACS access grants for climate-resilient production, processing and diversification. • 200 women-led small enterprises access funding for climate-resilient income diversification opportunities.

b. Consistency with GEF policies and strategies for SCCF

136. This project has been developed in conformity with the SCCF eligibility criteria. The project proposal respects the principle of country ownership having been developed in consultation with national stakeholders, as well as by taking into account all the latest and relevant studies and reports available on climate change adaptation in Egypt.

137. The project has been designed to fully address the priority activities identified by the Government of Egypt in the SNC, CCAPF, National Strategy for Adaptation to CC and DRR, SADS, and it has been developed with the aim of ensuring sustainability and replicability beyond project completion. The project design criteria have been respected by including a list and description of the project components as well as by describing the added value of the GEF intervention (additionality). The GEF component will build directly on past and ongoing investment projects from IFAD and other agencies, and it will complement activities and achievements in light of the expected impact of climate change. Co-financing requirements are satisfied and cost-effectiveness aspects have been carefully considered. The project will be mainly investment-oriented and aims at encouraging replication and scaling-up at national level.

c. Country Eligibility, Ownership and Drivenness

138. Egypt was among the first Arab countries to join the cooperative global efforts to confront climate change. Since the Rio de Janeiro Earth Summit in 1992, it has ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and signed the Kyoto Protocol in 1999. Its First National Communication to the United Nations Framework Convention on Climate Change was published in 1999. The report pays extensive attention to the risks facing the country due to climate change and sea-level rise, mainly in relation to agriculture, water resources, human health, and the coastal zone (particularly the Nile Delta). It also includes economic loss estimates for sea level rise in several coastal cities. Moreover, a large range of adaptation options are identified, most of them "no-regrets". The report however appears to be weaker in terms of the implementation arrangements for the adaptation options.

139. Reports and strategies relating to other environmental conventions, such as the Ramsar Convention on Wetlands, the UN Convention on Biodiversity and the UN Convention to Combat Desertification pay little attention to climate change, even though they nominally mention cooperation between the environmental conventions. However, some of their action plans do contain elements that could also be part of an adaptation strategy for Egypt. For instance,

measures to alleviate desertification or conserve coastal ecosystems are likely to make the country more resilient to climate change.

140. Egypt's National Strategy for Sustainable Agriculture Development towards 2030 (SADS) clearly stipulates vulnerability to rising temperatures as one of the most pressing issues that require immediate response. Among the most important factors behind decisions to prepare SADS there are the adverse effects of climate change on agriculture production. The execution of SADS includes a number of programs and sub-programs, making specific reference to climate change: (i) the National program to rationalize and upgrade efficiency of water use in agriculture aims to raise on-farm water use efficiency to 80%, proposing the adoption of a national network to monitor climate change affecting agriculture; (ii) the National program for agriculture research, extension and technology transfer aims to respond positively to the adverse effects of climate change on agriculture production. The achievement of SADS objectives implies the need to increase the productivity of all field and horticulture crops through the cultivation of salinity- and drought-resistant varieties in order to cope with climate change impacts. The development opportunities identified by SADS for the 5 geographic regions (Upper Egypt, Middle Egypt, Middle Delta, Eastern Delta and Western Delta) include measures with a CC adaptation value, such as the use of water saving efficient irrigation technologies, the promotion of organic agriculture and integrated pest management, the sustainable use of agriculture residues, the expansion of high-value leguminous trees suitable for the climate of the regions, the promotion of drought-resistant and saline-resistant crops and varieties (e.g. sugar beet and date palm), the establishment of climate-proof storing and processing facilities to improve marketing opportunities, the genetic improvement of animal breeds, the diversification of income generation through complementary crops such as aromatic and medicinal plants and tourism services, the development of soil-less agriculture technologies combined with aquaculture.

d. Project goal and objectives

141. The project has been designed keeping in mind the strategic priorities of the Egyptian Government on agriculture and climate change adaptation, as well as the findings and recommendations of relevant studies and research, including the IFAD's Climate Change Vulnerability Assessment for Small-holder Farmers in Rural Societies in Egypt (July 2014).
142. The SCCF **Project Goal** is to increase food security and incomes for poor rural women and men through climate-resilient agriculture. By the end of the project, at least 24,000 households in the project area will have increased climate resilience and will have sustainably moved out of poverty. Furthermore, at least 16,000 households will have improved asset ownership index compared to the baseline.
143. The SCCF **Project Development Objective** is to enhance farmland productivity and income diversification in the reclaimed lands. This objective will be achieved through increasing by 40% the average incomes of 60% rural poor household engaged in livestock value chains at project completion, with 30% of the target smallholders participating actively in commercial farming and business development by the end of the project.
144. The SCCF project is fully embedded in the IFAD SAIL baseline project in a synergetic fashion that will ensure that GEF funding covers additional costs associated with CC adaptation needs, in line with the governmental priorities on climate change. The planned duration of the project is 7 years starting in late 2015. The time frame of the SCCF has been adjusted to ensure full overlapping with the IFAD baseline project, and take advantage of a shared institutional and management framework.
145. In order to maximise chances of success, the project will build on the achievements and best practices from past and on-going projects carried of by IFAD or other agencies in reclaimed lands of Egypt, especially WBSP project in West Beheria and WRNDP project in West Noubaria, and will establish synergies with ongoing initiatives led by agencies such UNIDO, UNDP, WB, IsDB, EU, GIZ and other bilateral donors active in the sector. The project will also benefit from models and case studies from neighbouring countries, such as the IFAD Irrigation Technology Pilot Project in Jordan.
146. The project is in line with the Egyptian SADS, SNC, CCAFP, National Strategy for Adaptation to CC and Disaster Risk Reduction, and draws on governmental priority adaptation measures and technologies.

e. Project components

147. The project will be shaped around three main lines of work, or Components:
148. Component 1: An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands, responds to the request of MALR and EEAA to build their capacity to analyze the climate change impacts on agriculture production and water management in the reclaimed lands, and mainstream suitable CC adaptation measures and technologies in relevant policy frameworks and documents. The project will support MALR in the development of a Dynamic Agriculture Information and Response System (DAIRS) to improve long-term forecasting of climate-risks, through early warning and response mechanisms.
149. Component 2: Optimized irrigation water management at the tertiary and on-farm levels will focus on the rehabilitation and modernization of the tertiary level irrigation canals, pumping stations and conveyance systems, with the use of innovative renewable energy technologies, and the introduction of on-farm micro-pressurized drip irrigation equipment to make an efficient use of the scarce water resources and prevent salinization problems. The formation and strengthening of water user groups (WUGs) will be a pre-requisite for any investment in irrigation to ensure farmer ownership and proper operations and maintenance.
150. Component 3: Climate proofing of crop value chains and diversification of local livelihoods will provide extension services, training to farmers, institutional support to farmers' organizations, and funding to support investments in climate-resilient value chains: the preferential adoption of high-return and water conserving crops, and the introduction of production and post-harvesting systems and technologies that increase quality, diversification of derivatives, and marketing opportunities). The project will make use of available research and demonstrated yield improvements using CC adaptation practices, in the framework of the IFAD-funded research programme implemented by CLAC, and other programmes testing new technologies supported by international organizations like ICARDA.

Component 1: An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands

OT 1.1: *Climate change adaptation measures for agriculture production in reclaimed lands are mainstreamed into relevant policy frameworks and decision-making tools.*

151. This outcome will revolve around two different actions built into the same policy overarching framework: (i) governmental staff from relevant institutions and departments (MALR, EEAA, EMA, CLAC, CCICRE) have acquired knowledge on CC downscaling methodologies and have applied it to mainstream CC adaptation recommendations for the agriculture sector into policy documents and official reports responding to regional and global processes; (ii) development of an effective and sustainable Dynamic Agriculture Information and Response System (DAIRS).
152. **OP 1.1.1:** Relevant governmental staff is enabled to mainstream CC adaptation recommendations for the agriculture sector into policy documents and official reports responding to regional and global processes.
153. Climate change downscaling scenarios will help decision-makers to adjust agriculture policies and regulations, development strategies, technological investments, and management systems to the expected changes in climate. This will require institutional strengthening and capacity building actions on CC downscaling technologies, targeting the public administration, including public researcher and extension providers.
154. The project will design and organize a specific training programme on CC downscaling and its application to agriculture value chains in the reclaimed lands of Egypt, targeting public administration staff. The course will have a duration of about 2 weeks, and will include: (i) theoretical and methodological elements to become acquainted with the science of climate change, the analysis of CC impacts on agricultural systems and CC downscaling approaches; (ii) Practical application of CC downscaling in the analysis of how climate affects different crops, the definition of indicators to verify the most critical aspects of climate changes along value chain stages, and the use of CC downscaling results to adjust crop production and post-harvesting calendars, technologies and management systems.
155. Through this capacity building action, the project will ensure that CC downscaling results and climate-resilient agriculture measures are mainstreamed in the strategies, policy regulations and work plans of the MALR supporting agriculture development in the reclaimed lands, incorporated in the EEAA policy documents (e.g. CC Adaptation Technology Needs Assessment) and reporting to the UNFCCC process, and actively promoted through the public extension work among farmers and farmers' organizations, such as the WUGs.

156. The project will hire international and national TA to plan and organize the capacity building actions, and to facilitate a consultation through a series of national workshops that will eventually lead to the formulation of the Strategy. The TA will support the collection of information and analysis of the national policy context, the identification of case studies providing good examples of mainstreaming CC adaptation into agriculture policies, and the formulation of draft technical documents with policy recommendations to be introduced and discussed with all concerned stakeholders in national, regional and international workshops.
157. The project will play a pivotal role in supporting MALR and EEAA in the production of official reports, policy documents, and all relevant information, ensuring coordination with the relevant government agencies and partners, both at central, governorate and local levels. The produced information will be accessible to all interested audience, being disseminated through the web, in the form of user-friendly printed materials for awareness raising and communication purposes, and official documents for policy-makers and to be discussed in international and regional policy processes.
158. **OP 1.1.2:** *an effective and sustainable Dynamic Agriculture Information and Response System (DAIRS) supports decision-making to mitigate climate risks in agriculture production in the reclaimed lands.*
159. Several official documents (e.g. SADS, CCAPF, and National Strategy for Adaptation to CC and DRR) call for strengthening the capacity of monitoring, forecasting and disseminating early warning information about climate-risks affecting agriculture development in current and reclaimed agricultural areas, through: (i) the creation and installation of monitoring stations for climate impact indicators on agriculture productivity (e.g. temperature, greenhouse gases, relative humidity, change in groundwater quality, change in organic and inorganic nutrients content of the soil, intrusion of sea water into the Delta lands, and others); (ii) the development and adoption of early warning and climate-risk prediction systems to forecast the impact of future climate change on agriculture production, inform farmers about risk reduction options, and support preparedness and response plans.
160. The Project will address these recommendations by supporting MALR in the installation of weather stations and the development of a Dynamic Agriculture Information and Response System (DAIRS) to help improve long-term forecasting and enhance the capacity of all concerned stakeholders to cope with and respond to climate change related hazards. It is estimated that DAIRS will reach out to 20,000 beneficiaries.
161. The project will provide technical Assistance (TA) for the set-up of a system for weather and hazard prediction. The DAIRS will provide policymakers, technicians, village development committees, pastoralists and other rural stakeholders with the most up-to-date and accurate information available on meteorological-related risks, so that disasters can be minimized or avoided. DAIRS will deliver recommendations on how to reduce climate risks for agricultural sector and increase the resilience of IFAD's beneficiaries, namely small-scale farmers in new settlements in Upper Egypt, Middle Egypt and Lower Egypt.
162. The system will deliver the accurate irrigation scheduling that reduces the cost of irrigation and minimizes problems related to the misuse of water. Early pest and disease forecast and warnings allow suitable time for taking necessary actions to avoid chemical spray. Proper calculation of sowing dates ensures uniform plantation and reduces the cost of sowing seeds in several crops. The above mentioned agricultural management practices require real time weather data system covering the targeted areas.
163. The proposed DAIRS will comprise five components: (i) Automated Weather Forecasting System (AWFS); (ii) Integrated Derived Variables Models of (IDVM); (iii) Alerting Services Platform (ASP) to adapt the information to the user's needs and to facilitate its management; (iv) Involving Agricultural Cooperatives from an early stage inside the system; and (v) System Sustainability Management (SSM). This will be coupled with a capacity building programme to prepare institutions and beneficiaries in the implementation and use of the DAIRS.
164. The Automated Weather Forecasting System (AWFS) should consist of a software package installed on a personal computer, with Internet access, to be initially hosted within the CLAC. The system should produce daily categorical and probabilistic forecasts, for at least the following 5 days, for rainfall and temperature for each point, with daily historical observations of the corresponding variable. As an additional development for those stations that are characterised by short observation series, techniques for the temporal extension of those series could be introduced, so that the AWFS would also produce forecasts for these stations, with a better spatial

coverage of the territory. The system should be fully automated through all the stages (receiving input information, generating forecasts, elaborating and distributing products) without requiring any human intervention, except for certain routine maintenance, and eventual incidents resolution. The system should automatically integrate the produced forecasts into the GIS platform, so that these forecasts can be managed and used as input of the derived variables models in the platform.

165. The production of Derived Variables Models and Specific Indexes for agricultural production (crops & livestock) consists of a computer programme package that calculates some derived variables and specific indexes for pasture and livestock, showing the effects of weather, and more specifically, drought, on them. It should produce daily predictions at a number of derived variables and indicators, including two main parts: (i) dynamic agricultural practices (irrigation requirements, fertilization, proper sowing dates, etc) and (ii) early warning events (warm waves, forest, cold waves, storms, epidemic outbreaks of pests and diseases, etc). This output should consist of a complete open source, specially developed for use as DAIRS for meteorological hazards. It should be housed in a relatively powerful Internet server. It should manage and provide access to all the weather (observations and forecasts from all available sources) and derived variables information, as well as to other information (geographical information, land use). Additional developments should include other layers such as satellite information regarding cloudiness, precipitation, vegetation conditions, photosynthesis activity, etc. Additional developments could include simulation tools, which will be nested with the forecasts available, so the simulations should be driven by foreseen weather conditions. If other simulation tools are available (e.g. flash floods with hydrological models, animal diseases propagation), they should also be nested into the forecasts and implemented in the GIS platform.
166. The Alerting Services Platform should be fully automated through all its stages, without requiring human intervention, except for certain routine maintenance, and eventual incidents resolution. It should incorporate a comprehensive warning module in which the user can define the area, the variables and thresholds to trigger different levels of alert. The user should also be able to customize the dynamic information and warning communication mode (SMS, THABIT, TV broadcast, e-mail etc.). The dissemination of information occurs through SMS/email Alerting Services as well as a daily tips. Agricultural decision support system with mathematical and logical models is linked with a Geographical Information System (GIS) to provide tools for planning the land utilization and resource management options.
167. The selection of variables and indexes should be done in collaboration with the MLFR federal, state and locality staff, village development committees, pastoralists and other local experts. This activity should include the collaboration with other institutions and organizations of Egypt involved in the development of early warning systems (e.g. Egypt Meteorological Authority/EMA, UNDP, WFP, UNEP, Cairo University, etc.). The system will possibly involve Agricultural Cooperatives from an early stage, and the project could explore together with CLAC and extension agents how to make this a service that the cooperatives could offer to their members.
168. System Sustainability Management (SSM): over the turnout to participate in the system depends on the realistic and the importance of the information that reaches the farmer. The project could support this information transmission initially of that the farmer will bear the cost after the first or second year of project. This could be through the discussion of a partnership with a private sector to overtake that. Later on, the system should be provide farmer with market data information because of lack of reliable market information is one of the major factors that prevent farmers from getting the full market value for their farm produce.

Component 2: Optimized irrigation water management at the tertiary and on-farm levels

OT 2.1: *Water users are enabled to design and implement optimal cropping patterns and climate-resilient irrigation plans.*

169. For the agricultural sector, optimising irrigation management becomes a vital and crucial issue, due to the limited freshwater and land resources. Considering that the two main limitations facing increased agricultural production are the availability of additional cultivable land and adequate use of irrigation water, it is necessary to determine the optimal cropping patterns to ensure efficient use of water and prevent environmental problems, such as land salinization, in the reclaimed lands.
170. The project will provide TA to analyse: (i) the major challenges that face agriculture and irrigation in the reclaimed lands of Egypt, (ii) the amount of land and water resources that should be devoted to each crop in the target areas, (iii) the optimal cropping patterns, among different alternatives, which satisfies the existing land and water availability constraints, as well as the

socio-economic conditions of the target areas, (iv) the criteria and instruments to be used in irrigation water planning and management, and (v) the optimal way to allocate irrigation water to different crops. The analysis will be based on field surveys, discussions with all relevant stakeholders, and bibliographic revision of examples and relevant case studies from Egypt and abroad.

171. The TA will also support the analysis with the development of a mathematical model as a management tool for determining optimal use of water in conjunction with optimal cropping patterns, and design irrigation plans for the efficient use of water in the targeted reclaimed lands. Results of the modelling will show how optimal cropping patterns and the potential to reallocate water resources in an optimal way can be achieved in the target areas. The modelling will also help identifying future potential improvement in irrigation management in newly reclaimed lands beyond the scope of the project. This will be a valuable tool for policy development, which may serve in developing agriculture strategies in the reclaimed lands, water-charging policies, and for the planning of cropping patterns and irrigation water use.
172. The expertise hired by the project will also provide training to civil servants, extension agents, farmers and farmers' organizations, on the use of modelling as a decision-making tool to design and plan suitable cropping patterns and optimize irrigation management (e.g. what is the optimal irrigation water demand and how much water should be allocated to a particular crop relative to other crops) in the target areas.
173. The project will also help establish Water User Groups (WUGs) and train them in the proper operation and maintenance of the irrigation and drainage infrastructure. Training and capacity building of WUGs will be provided through a participatory approach for good pump and mesqa operation, maintenance planning, and water management. The farmers will be required to put in place a system for cleaning and maintaining all irrigation and investment systems. They will be required to establish and levy a system for payment of user charges. The WUGs will also be provided with tools and equipment to clean and maintain the irrigation and drainage infrastructure. They will be made aware of ground water quality, yield impact of over-watering of crops and the measures to adopt in case of soil salinity, etc.

OT 2.2: *Investments in modernized water distribution and irrigation systems allow farmers' associations to make an optimized use of water*

174. The baseline SAIL project will provide financial support for the rehabilitation and modernization of tertiary water distribution infrastructure and equipment. A participatory assessment of the community needs will help tailored the infrastructure to be provided in the target areas. A preliminary survey implemented in the project design phase indicated the following needs: (i) the establishment of new Mesqas (tertiary canals) along with drainage improvements (to be kept earthen in order to allow ease of maintenance and flexibility to the farmers for diversion) in Kafr el Sheikh, and with the provision of buried pipe mesqas in some areas of Middle Egypt benefiting 6,000 feddans; (ii) the need of reparation and maintenance works on about 17 pumping units on branch canals in Middle and Upper Egypt; (iii) the use of backhoes to ensure that drainage canals are cleared and the effect of water-logging - which is expected to exacerbate soil salinization and lead to deterioration of crop quality and productivity - is controlled in Lower Egypt; (iv) the installation of laying underground pipe Mesqas, shared pumping (for about 4 farmers, 20 feddans maximum) and/or low pressure buried piped Marwas in Upper Egypt; etc.
175. The SCCF project Additionality to the baseline interventions will consist in the provision of investments in climate-proof innovative technologies such as solar pumps, that will reduce the high cost of energy and contribute to a cleaner environment and a reduction in emission of greenhouse gases⁵⁵. Prior to installation of solar systems, the project will hire TA to analyse the existing pumps in the settlements of Middle and Upper Egypt. The analysis report will provide an assessment of the type of pumps in the area, their capacities, current efficiency level, energy consumption and potential configuration of new solar pumps. About 350 solar water pumps will be installed in Middle and Upper Egypt with each pump serving around 20 feddans and expected to benefit a total of about 7,000 feddans. The capacity and configuration of the pumping systems will be tailored for each location depending on the Total Dynamic Head (TDH), the output required and irrigation conveyance systems at the field level. The change from diesel and electric pump sets to solar powered pumping units is expected to save between 25~30 MW/day from the national grid. The pumping units are envisaged to be direct DC submersible pumping units, which are more cost efficient and work on variable voltages. The system will cater for field requirements of night pumping which is necessitated due to the rotational availability of water for limited days in a

⁵⁵ Approximately 15,000 tons/annum of GHG will be saved.

week. Automatic power converter modules can be integrated in the system to allow for auto switching from solar, to utility grid or even to a gen-set as may be required. The project will provide a loan facility for farmers who opt to replace their old inefficient diesel pumps with new units integrated with efficient irrigation systems.

176. Farmers and WUGs will be involved through a participatory approach in the design of the pumping systems. Lessons learned from the Irrigation Improvement Project (IIP) and the Integrated Irrigation Improvement Management Projects (IIIMP) suggest that it is essential to form WUGs and carry out close consultation with men and women farmers and involve them in the design of the networks prior to introducing any new system. Previous experience from West Noubaria also shows that small pumping systems serving 15~50 feddans, are more sustainable and more easily accepted and managed by the farmers.⁵⁶ In addition, in areas located at the tail end of the canals, water is available only on rotational basis for limited periods necessitating higher capacity of pumps in the tail sections. As WUGs comprise a small number of farmers who jointly manage the pump that irrigates their land, women landowners will automatically be members of the WUGs where they own land. Women's role in irrigation and water conservation will be identified and an appropriate mechanism designed for their participation
177. Studies for the assessment of salinity, drainage and underground water will be conducted under the project prior to finalization of technical designs. Special attention will be given to farmers from Lower Egypt and some villages in Upper Egypt who are having increasing problems with salinity, rendering their lands less favourable for cultivation. Groups of progressive farmers from the three regions will be afforded the opportunity to learn about new emerging soil-less technologies such as, hydroponics, aquaponic combining fish aquaculture with hydroponic in a symbiotic way, automated irrigation systems and fertigation techniques through on-field exchange visits within Egypt and or neighbouring countries. Each group could comprise of 4~6 farmers. The project will provide funding to test suitable and economically viable soil-less technologies in 22 demonstration farms distributed in the different target areas.
178. The project will also provide grant funding to farmers for the acquisition of micro-pressurized drip irrigation equipment, which is the only irrigation system allowed in reclaimed lands as defined in the MALR land reclamation policies. In Middle Egypt, the farmers have generally adopted water efficient technologies, and through extension services under the project, the farmers will be assisted in maximising the use of scarce water resources through suitable drip irrigation systems and technologies for each type of crops.
179. Training in new technologies will be provided to ensure sustainability. Under the project, training by appropriate specialists from the private sector will be provided to community groups in each settlement. Over the life of the project, training in solar technology and drip irrigation technologies will be provided in each of the 30 villages (two days training twice a year), while knowledge and skills on soil-less hydroponic and aquaponic technologies will be provided to community groups in the areas more vulnerable to salinization. Training will facilitate development of locally skilled cadre of youth trained in installation, maintenance and repair of efficient irrigation systems and solar technologies, electricians, plumbers and other related skills. This will help the youth to gain marketable skills and become engaged in productive livelihoods.
180. Overall, the activities under this Outcome are expected to benefit about 24,000 households (169,000 beneficiaries) and improve irrigation in about 62,000 feddans in the project areas⁵⁷.

Component 3: Climate proofing of crop value chains and diversification of local livelihoods

181. **OT 3.1:** *The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed.*
182. The objective of this Outcome will be to enhance crop and livestock production and productivity through the adoption of improved, climate-resilient agricultural practices and technologies. Attention will be provided to enhanced resilience of farming systems through production diversification, reduced post-harvest losses and enhanced quality of produce. The project will also support activities that increase the resilience of the smallholders to challenges such as water scarcity, salinity, increasing temperature, decreased rainfall and other climate change impacts. Following governmental recommendation on CC adaptation in agriculture production (e.g. SNC, CCAFP), the project will help:

⁵⁶ An exploratory survey of Water Management in the Meet Yazid canal command area of the Nile Delta, IWMI-WMRI, Dec 2013.

⁵⁷ Estimated after excluding possible duplicate beneficiaries from investments within the same project area.

- introduce crops and varieties, such as high-yielding early maturing cultivars, with increased productivity and market potential, adapted to drought, higher temperature and salinity;
 - adapt current cropping patterns to CC conditions, and crop farming practices and management systems (e.g. changing sowing dates, changing crop varieties well adapted to agro-ecological conditions, changing farming systems supporting soil & water conservation, and changing irrigation techniques favouring water use efficiency, applying integrated pest management) to increase productivity at rates between 25-40% more, crop diversification and farm income;
 - promote the value added of farm residues and by-products for organic fertilizers, soil mulching, or animal feed (it is estimated an amount of more than 25 million ton of crop residues in the agriculture sector);
 - improve livestock integration in the farming systems to increase income generation, especially for the women farmers, enhance family nutrition, improve soil fertility through availability of animal manure, and support resilience of farmer families through the diversification of sources of income and making available sources for cash.
183. The Project will build on the experience of the WNRDP and on available and adapted technologies tested through IFAD investment projects as well as the results from several research projects in Egypt. Interventions in the livestock sector will include technologies adopted in the WNRDP as well as the scaling up of other successful technologies.
184. Building on the experience in WNRDP and using the available infrastructure and technical capacities in the centre for artificial insemination (AI) in West Noubaria, training will be provided to interested beneficiaries in AI. Small mobile units from the West Noubaria laboratory will be established in the SAIL project sites in Lower, Upper and Middle Egypt that will provide training and the needed material (semen, liquid nitrogen, etc) to them to enable them to provide AI service to the communities for a fee.
185. The project will provide additional extension services and training on CC adaptation agronomic systems and technologies to the SAIL target farmers, through various extension methodologies and approaches. The project will make sure that the cadre of extension workers and service providers, established by the baseline SAIL interventions within the agricultural cooperatives and the community, is able to provide extension advice on innovative adaptation management systems and technologies for crop and livestock improvement for the target population. The project will use the extension methodology that has been successfully used in WNRDP, which is based on hiring special project extension staff responsible for organizing specialized one-day training courses for a number of farmers on special production technologies with the support of experts from educational and research institutions. These will be done both in the classroom style as well as in farmers' fields. The topic of the trainings will respond to the needs of the farmers and the market. The experience of WNRDP demonstrates the considerable value for the smallholder of these services.
186. The project will specifically target women, by establishing a cadre of women Community-Based Livestock Extension Workers (CLEW) that will be trained on adaptation agronomic systems and technologies and deployed in the villages, in view of the central role played by Egyptian women in livestock. The training will be offered to three to five women from each village. The training will be organized at the local level with pick and drop service provided to ensure women's access to this training. In case the training needs to be residential, the project will enable a family member to travel and stay with the woman as that will make this arrangement culturally acceptable. The best performing woman will be selected to be a CLEW for her village. She will be provided with a start-up package containing basic veterinary tools to help her quickly assume her service delivery and develop confidence, under the close supervision and guidance of the women veterinarians and agronomists being employed by the project as Livestock specialists in the RPMUs. She can replenish the consumable items by charging its cost from the farmers served. The CLEWs will be supported with a performance-based stipend for the first two years: they will make 30 household visits and hold five sessions per month. These will be reported to the women livestock specialists who will be in charge of monitoring their performance.
187. Following the same approach as in the baseline SAIL interventions, the project will introduce and pilot the participatory approach of farmer field school (FFS) to deliver extension on key adaptation agronomic systems and technologies, such as: the use of solar technologies for irrigation and for post-harvesting storage and processing; the testing of micro-pressurized irrigation, and soil and water conservation technologies applied to new crops and varieties; the piloting of soil-less hydroponic and aquaponic technologies, etc. During the initial phases of the project, participatory dialogues will be held with local communities to assess public perceptions about CC impacts, analyse adaptation needs and options, and identify constraints and opportunities. During this phase, the priority adaptation measures/constraints of importance to

the farmers will be identified as the entry point to the FFS that will be established and around which the FFS curriculum will be developed. As women are the primary caretakers of livestock, 15 out of the 20 women trained as FFS facilitators for livestock will be women. In the process, the project will identify about 40 key farmers (at least 10 of which will be women) who have social skills, have good farming experience and knowledge, are motivated and trusted by the community and who are ready to be trained and act as FFS facilitators for the following years, ensuring that all village and active agricultural cooperatives are represented. The 40 selected facilitators will be intensively trained by international and, where available, national FFS master facilitators in various participatory approaches and in the technical issues related to the FFS.

188. The project will include a mechanism whereby the farmers will start paying for the services of the facilitators on a gradual basis. It is also expected that once there is a critical mass of farmers within an agricultural cooperative who are organized, are producing more and have access to markets, the cooperative will hire the services of these local facilitators to provide extension support to their members. Similarly with the improvement in livestock production and the increase in the request, the community development associations (CDAs) are expected to hire those trained facilitators to become community extension workers on a small fee for provision of services on innovative adaptive technologies.
189. The project will also make special arrangements allowing farmers to participate in learning and exchange visits to other farms in Egypt that have successfully introduced new adaptation technologies and models. Knowledge sharing events for farmers will be organized in each target area every year and this will complement the FFS facilitator refresher workshops to be organized every other year.
190. **OT 3.2:** *Beneficiaries have improved agriculture production and market competitiveness through investments in climate-resilient value chain technologies and diversification strategies.*
191. In this Component, greater participation and voice for women will be facilitated by the project, considering their higher vulnerability to climate change and their critical role in developing resilient responses. A women's committee will be formed in the Agricultural Cooperative to discuss issues specific to women farmers. One or two representatives of this committee will be included in the board of the cooperative. A market study will be conducted to identify agri-related businesses for women's groups such as the processing of medicinal plants, hydroponic greenhouses and fish farming. Where this will become possible women will have their own marketing association.
192. To complement the capacity building process and the testing of good adaptation practices and technologies in the FFS, the project will provide to the agriculture cooperatives access to finance and capital grants for the acquisition of: (i) solar pumping technologies and efficient irrigation equipment; (ii) innovative adaptation production technologies, such as conservation agriculture and organic agriculture equipment, hydroponic and aquaponic infrastructure and equipment; (iii) post-harvest infrastructure to reduce losses in quantity and quality of produce as well as to enhance the control of the cooperatives over the market price, such as solar dehydration units, cold storage facilities, composting units, and flexi-biogas units.
193. The selection of the type, size and specifications of the selected production and post-harvesting systems and facilities will be suited to the CC adaptation needs and the local environmental, and socio-economic conditions. The selection will be also based on production capacity and market assessments, and will follow specific selection criteria that will be related to the productive and managerial capacity of the targeted agriculture cooperatives (ACs), the type of processed material required by the market (dried, fresh, distilled, frozen, juice, etc), the quantities produced or required by the market, etc. These technologies will be appropriate for project settlements that are all in remote areas and will reduce the high cost of energy and contribute to a cleaner environment and a reduction in emission of GHG⁵⁸. For the introduction of these new technologies, a consultative process with women and men farmers will be adopted and demonstration units will be established. For solar installations in particular, the project will provide equipment for a group of 4 to 6 farmers from the source up to the filters, while the farmers will avail loans to add on drip and sprinkler irrigation systems. They will also contribute in the form of land, labour and local materials.
194. Solar dryers will be introduced as demonstration units, one in middle and one in Upper Egypt. These dryers will be of one tonne capacity and the units will specifically target women CDAs where they show an interest or Agriculture Cooperatives. In order to ensure sustainability, the dryers will be provided after a detailed business plan is prepared including development of a marketing plan

⁵⁸ Approximately 15,000 tonnes/annum of GHG will be saved.

and establishment of linkages with the private sector. The CDAs and ACs will have to evolve to a level where they can ensure effective management of not only the technology but also the ability to manage the required volumes of herbs, aromatic plants, or vegetables that are to be processed. Extension services in technology and marketing will be provided through a training programme to the selected CDAs/ACs under the project.

195. Hydroponic and aquaponic technologies will be also introduced in vulnerable areas to soil salinization as demonstration units. Successful experiences from other regions and actors in Egypt will be assessed, visited, and lessons will be applied in the designing and selection of specific systems and technologies. For instance, the Egyptian Hydrofarm initiative established in 2013 has locally developed hydroponic growing technology proven its effectiveness, producing 8 fold more per feddan compared to traditional agriculture, all while saving up to 95% water and eliminating the need for chemical pesticides and avoiding pollution.
196. The composting element of the project will support the agricultural development component in 10 selected villages. Composting has a high contribution to carbon sequestration, has the capacity to control plant diseases, improves soil fertility in many ways with its content of plant nutrients such as nitrogen, phosphorus and potassium, helps restore eroded soils and reduces nitrate leaching due to the increase in soil aggregate stability and water holding capacity of farm-land. The waste will be sorted at the household level into recyclable and organic waste. The composting unit established under WNRDP has been a great success and similar experiences are quoted in several developing countries⁵⁹. The key is integration with the solid waste management initiative, community mobilization, an effective pricing model and marketing linkages for the end product⁶⁰. The composting units will be established after a detailed business and marketing plan has been prepared and will be preferably managed by the women and youth in the rural community. Investment under the project will be a mix of grants, loan and community contributions. The end product can be sold to the farmers or marketed as a high value product after appropriate packaging as has been the experience in India.
197. Flexi-biogas can provide a clean, easily controlled source of renewable energy from organic waste materials for a small labour input, replacing firewood or fossil fuels. Under the project, 30 flexi-biogas units will be provided. These units will be small-scale units of 3-5 m3 capacity serving individual households. The selection criteria for site location and households for such units will be included in the Implementation Manual.
198. CDAs and ACs members will also be provided training in the management, as well as operation and maintenance of the facilities. The FMAs from West Noubaria and the market associations form WNRDP will be used as a training resource for the project beneficiaries. Lessons learned from IFAD supported actions in West Noubaria, and from partners from other regions in Egypt will be used as important resource for transferring knowhow and replication of successful experiences in the project areas. Among others, the experience of the Sekem Development Foundation, which established biodynamic agriculture as the competitive solution for the environmental, social and food security with a network of 600 farmers producing organic food for their own consumption and for sale, will be assessed as case studies to be replicated, and to be part of exchanges and learning visits.
199. The project will provide grants on a competitive basis to groups and individuals for starting small businesses that promote diversification and help in enhancing their adaptive capacities. At least 100 grants in kind will specifically target poor women, women headed households, landless women and youth, and in particular, the most vulnerable who do not qualify for loans. The size of the grant will depend upon the type of enterprise and initiative that is sponsored. The beneficiaries will contribute in the form of land, local materials and labour etc. The eligible individual or groups will be selected from among those who successfully complete their training through the project or submit viable and innovative proposals. The grants will be managed by the PMU based on a careful selection process. In addition, the project will also facilitate access to credit funds for those trained under this component. The details for the access to financial services are provided under the financial services component
200. The aim of these grants will be to encourage innovation and adoption of new technologies that have higher risks or unpredictable profits and encourage entrepreneurship. The farmers of Middle and Upper Egypt will be enabled to capitalise on their comparative advantage in producing high quality Herbal and Medicinal Plants (HMAPs), *Opuntia* cactus products, and other agroforestry

⁵⁹ D. Hoornweg et.al, "Composting and its Applicability in Developing Countries", The World Bank, 1999.

⁶⁰ R. Linzner, et.al, Recirculation of local organic waste in urban and rural agriculture – the impact on soil functions in Guinea/West Africa, March 2007.

products that also play an important role in soil conservation and strengthening environmental services, as well as off-season fruit and vegetables for which there is acute shortage of pricing and demand information. The grants will be offered under selected windows, such as: income diversification, adoption of new technologies, building climate resilience, entrepreneurship development, etc.

201. The project will support cooperatives in developing their capacities to serve their members, including through identifying marketing opportunities for the new crops and varieties and linking the farmers to them. Collective marketing will require that cooperative members are producing sufficient quantities of the quality requested by the market. The integration of women in these marketing associations or separate ones for women will be a priority area for the Project. Where the agriculture cooperatives are well established and managed and a market has been identified for larger quantities than what a cooperative can provide, the experience of WNRDP in establishing farmers marketing associations (FMAs) will be scaled up. In order to ensure a minimum volume of produce to attract the private sector, several agriculture cooperatives will be grouped into one FMA. These associations will be facilitated by the baseline SAIL project in accessing markets and in establishing fair contract farming arrangements with traders, processors and exporters. The FMAs and their cooperative members will be provided with training and awareness to orient farmers to produce high quality products that guarantee high market prices and understand the quality and standards required by different markets. Targeted extension will be provided for these markets, as for instance training aiming at certification of their produce such as that of organic certification, global gap certification, fair trade practices, etc. FMAs interested in organic certification will be supported in the first year by the project in completing the process of certification and in the associated costs, and they will be provided the needed training on the process of obtaining and retaining certification for export to protected markets, such that they should be able to be self-dependent in maintaining these certifications.
202. Experience in the WNRDP and the UERDP as well as various value chain assessments and studies indicate that all project areas have significant advantages to produce a wide range of high value horticulture crops, fresh fruits, medicinal plants and herbs, dried vegetables for which there is a huge demand both domestically and in Europe. There are several projects which are providing Global Gap Certification to meet this demand which can be capitalized upon by the targeted farmers. The Government has also established a supportive framework for promoting the development and growth of Agriculture Cooperatives and Market Associations and is willing to consider changes in policy to strengthen their engagement with markets and provide them access to financial resources through several windows.

f. Expected Adaptation Benefits

203. The GEF project represents an opportunity to increase the scope of the poverty reduction and food security objectives pursued through the IFAD SAIL baseline project in light of the predicted negative impacts of climate change on agriculture and livestock production in Egypt. The GEF financing will aim at increasing the climate resilience of agriculture and livestock value chains in the reclaimed lands through the introduction of renewable energies in the water pumping systems and the post-harvesting and processing equipment, the adoption of efficient irrigation technologies, the piloting of soil-less hydroponic and aquaponic technologies, the recycling and use of waste through composting and bio-gas technologies, and the promotion of climate-resilient agronomic systems, cropping patterns, livestock breeds and crop types and varieties. The GEF project will invest significant effort in enhancing the adaptive capacity of all concerned institutions, organization and actors, from the ministerial level, to the local beneficiaries and other value chain actors, with special emphasis on the women population, benefiting a total of 40,000 households in 30 villages of 5 Governorates.
204. An estimate of the adaptation benefits produced by the GEF project interventions is the following: (i) by the end of the project, at least 60% of the target farmers will report yield increases between 25%-40% and at least 40% income increases from climate-resilient value chains; (ii) 24,000 HH will be trained in climate-resilient irrigation and agronomic systems, and 4,200 members of WUGs will be trained in the efficient management of irrigation water; (iii) the efficiency of the water irrigation systems will increase by at least 80%, with water savings between 35% and 50% in the use of water to irrigate crops in 7,000 feddans; (iv) soil-less hydroponic and aquaponic farms will be piloted and operational; (v) 100 agriculture cooperatives will have accessed grants for climate-resilient value chains and 200 women-led small enterprises will have accessed grants for income diversification based on climate-resilient development activities.

205. The project adaptation benefits will also have a national-wide impact at the policy level, through: (i) the training of at least 20 staff members from MALR, EEAA, EMA, CLAC, CCICRE on CC downscaling methodologies applicable to the agriculture and livestock sectors; (ii) the production of relevant policy documents mainstreaming CC adaptation in the agriculture sector (e.g. the CC Adaptation Technical Needs Assessment; the CC adaptation strategy for agriculture development in the reclaimed lands); (iii) and the support to MALR for the development of a Dynamic Agriculture Information and Response System (DAIRS) at the national level, to facilitate early warning access to critical information about climate-related risks through media information and communication technologies (MICT) such as SMS message services to support decision-making by farmers and other practitioners in the effective planning, preparedness and response to climate-related risks affecting agriculture and livestock production.
206. The institutional development and training of at least 50 CDAs and ACs on CC adaptation systems and technologies for agriculture and livestock VCs will enable farmers' organizations, especially women and youth associations, with responsibility for operation and maintenance of water harvesting equipment and infrastructures, for the marketing of diversified agriculture and livestock products based on climate-proof technologies, including solar energy equipment.

Table 7. Expected adaptation benefits from SCCF activities

SCCF Activity	Expected Adaptation Benefit
Optimized irrigation water management at the tertiary and on-farm levels	<ul style="list-style-type: none"> • Increased water availability in the reclaimed lands, reduced water losses, increase water use efficiency by 80%, and 35% to 50% water saving in irrigated crops; • 80% to 90% reduction in the use of water in soil-less farming systems; • Reduced energy costs and GHG emissions from fuel pumps by shifting to solar pumping equipment.
The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed	<ul style="list-style-type: none"> • Increase between 35% and 50% of crops yields; • Soil erosion reduction by 60-90% in the intervention areas; • Generation of jobs and a range of auxiliary business in the crop value chains, with special focus on women and youth; • Reduced workload of women as a result of innovative technologies and improved farming systems, with more time available for education, training, and the development of small businesses.
Income diversification through a mixed economy based on livestock-cropping production and marketing	<ul style="list-style-type: none"> • The members of at least 50 CDA and ACs are trained on climate-resilient VC technologies. • 24,000 practitioners have improved production and marketing based on climate-resilient technologies. • 100 agriculture cooperatives access grants for climate-resilient production, processing and diversification equipment. • 200 women-led small-enterprises access grant funding for climate-resilient income diversification opportunities.
An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands	<ul style="list-style-type: none"> • At least 20 staff members from relevant governmental institutions and departments have acquired knowledge on CC issues and methodologies. • Relevant policy documents on CC and agriculture are prepared, and concerned policy frameworks have mainstreamed CC adaptation in the reclaimed lands. • A Dynamic Agriculture Information and Response System (DAIRS) to support farmers in effective planning and preparedness to overcome climate-related risks is operational at the national level.
Gender and youth inclusiveness	<ul style="list-style-type: none"> • Minimum quotas established to ensure participation of women (at least 50%) and youth (at least 40% men and women younger than 30 years). • GEF & baseline project staff and service providers trained on gender and CC issues; service providers with proven capacity to work with women, including the use of female facilitators; • The project will organize groups of producers, with emphasis on women/youth groups. Females would be targeted through women

	<p>and rural development structures as these institutions facilitate independent access to land, farm equipment, credit and training for their members.</p> <ul style="list-style-type: none"> • The project will develop strategic partnerships with national youth and women associations to strengthen their capacity on CC adaptation issues.
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g. Linkages with other related initiatives

207. IFAD will coordinate with all UN agencies wherever possible, and attempt to partner particularly with UNIDO and other government and non-government institutions in identifying and deploying innovative technologies and solutions. Partnerships with regional donors including the World Bank, the African Development Bank (IsDB) and Arab Funds are being nurtured and will benefit from IFAD's framework for cooperation with IsDB for project financing. The project will coordinate with active EU and other bilateral donors active in the sector and areas of intervention ensuring as well distribution of the collected data through the appropriate research institute.

208. The GEF intervention will complement other relevant GEF-financed initiatives in Egypt such as UNIDO/"Promoting Low-carbon Technologies for Cooling and Heating in Industrial Applications in Egypt" and UNDP/"Grid-Connected Small-Scale Photovoltaic Systems in order to ensure the use of the most advanced technologies in Agriculture" (i.e. water pumping, post harvest techniques, storage rooms). Additionally the project will ensure coordination and synergy with UNESCO, UNDP61, WFP62, GIZ63 and UNEP64 in sharing all lessons, experiences and produced data necessary to enhance and consolidate the regional Climate Change forecast models.

209. Collaboration will be sought with other institutions and UN agencies, mainly UNIDO, in identifying and deploying innovative technologies and solutions, as well as capturing successful experiences that could benefit the target communities.

h. Risks and Assumptions

210. The main potential risks threatening the SCCF intervention can be grouped under the following categories:

- A policy environment not amenable to enhancement and limited coordination among institutions;
- Significant civil unrest and natural disasters in the project area;
- The complexity of the chosen approach;
- Risks stemming from social norms and existing behaviours, and low level of buy-in from the final beneficiaries.

Table 8. Risks and proposed mitigation measures

Risk	Rating	Proposed Mitigation Measures
Policy and institutional risks: coordination among national institutions is often problematic and their capacities are limited.	Medium	The intervention will contribute to addressing these issues through a sustained capacity building/development and engagement effort. Policy dialogue will give priority to emphasising the criticality of increased commitment to increase strategic planning and climate proofing the value chains to decrease climate change vulnerability, increase productivity, generate revenues, and contribute to food security.
Temporary Social unrest risk related to the current economic crisis and lack of working opportunities.	Medium	This risk will be mitigated through a coherent and continuous participatory approach ensuring full permeability between communities and institutions. The approach will therefore allow

⁶¹ Active projects: Adaptation to Climate Change in the Nile Delta

⁶² Active projects: Enable poor communities in rural Upper Egypt and border governorates to adapt to climate change and market shocks, reduce agricultural losses through supporting national efforts to create sustainable livelihoods;

⁶³ Active projects: Agricultural water productivity as a way of adapting to climate change and Adapting to climate change in the water sector in the MENA region.

⁶⁴ Active projects: Green Economy Initiative.

		communities to be at the centre of their development ensuring arable land and job opportunities.
The ability of the existing institutional and policy/legal context to drive a successful wider implementation of the up-scaling efforts that the project is aiming at.	Low	This risk will be mitigated by putting significant efforts to create an enabling environment for mainstreaming and up-scaling the introduced innovations to value-chain development and planning. The successful examples at the national level and beyond will be built upon. The private sector and policy makers will be targeted in awareness campaigns and involved in the planning of investment choices in order to ensure a buy-in at all levels. The creation of businesses will ensure sustained contribution to food security
Complexity of the chosen approach: the participatory development approach that drives the intervention is highly dependent on the quality of the staff deployed in the field teams, the provision of adequate incentives and the participation of women in the process. Cultural traditions may prejudice the project's attempts to give women a greater voice.	Medium	The intervention will build on effective and efficient project management units established during the previous IFAD projects. The trust and relationships built with communities in the target would increase the likelihood of success in achieving the project's objectives. The approach of seeking win-win situations with investments that can clearly benefit all concerned users will be an incentive for dialogue and conflict resolution among different segments of the rural communities.
Elite capture by large commercial farms existing in the vicinity of the project area.	Medium	The best way to protect against this risk that the smallholders may sell out their land to other more profitable farmers is to make the smallholders profitable and sustainable enterprises, which is the main purpose of the project.
The project fails to capture the interest of final users at the community level.	Low	Key strategies such as awareness raising, the institutional development, training and technical support of CDAs and ACs, the training of trainers programme supporting community members – women and men – to become facilitators and providers of extension support to the project beneficiaries, and a solid learning by doing (FFS) capacity building programme, coupled with ensuring that economic incentives are well developed.
The project fails to expand women's access to and control over fundamental assets.	Low	The Project is specifically targeting women groups to enhance their access to capital, physical assets, support services and knowledge. The project will therefore ensure the highest participation of women and women organizations in order to ensure the most accurate representation of all gender needs and its perception of needs to be addressed.

i. Sustainability and Replicability

211. The sustainability of the flow of benefits from the SCCF intervention, assuming technically appropriate investments, depends on: (i) the buy-in of local communities, especially the newly-established water user groups, and their capacity to run, manage, and benefit of the project investments, namely the rehabilitated and modernized irrigation canals, pumping stations and conveyance systems, and the infrastructure aimed at making a more efficient use of water and preventing salinisation; (ii) the capacity of MALR and EEAA to capitalize on the capacity building effort, mainstreaming suitable CC adaptation measures and technologies in relevant policy frameworks and documents, and enhancing their ability to analyze the climate change impacts on agriculture production and water management in the reclaimed lands; (iii) the capacity of farmers and farmers' organizations to take full advantage of the investments in climate-resilient value

chains, and the support to production and post-harvesting systems, diversification, and marketing; (iv) the delivery of high-quality, timely technical assistance to all beneficiaries throughout the project duration; (v) the creation of solid synergies between the SCCF intervention and the baseline SAIL project.

212. The sustainability of project interventions is ensured by the integration of lessons learned during implementation of previous projects, particularly with regard to: (i) empowering communities to drive planning, implementation and monitoring and evaluation to the extent feasible; (ii) ensuring sustainability of infrastructure investments through effective mobilization, training and regular follow-up of user associations by specialized field staff with a deep understanding of communities in which they work and extensive training in conflict resolution; (iii) avoiding elite capture. The climate financing and integration of adaptive planning will ensure that investments are more sustainable and contribute to vulnerability reduction.
213. Long-term sustainability will be sought through a broad and deep CB programme, designed to create a critical mass of knowledgeable and skilled experts on CC adaptation for agriculture development and water management and conservation at the national level, and among all actors – from institutional to grassroots. The capacity building effort under Component 1 will ensure that CC downscaling results and climate-resilient agriculture measures are mainstreamed in the strategies, policy regulations and work plans of the MALR supporting agriculture development in the reclaimed lands, incorporated in the EEAA policy documents. The development of a Dynamic Agriculture Information and Response System (DAIRS) will provide policymakers, technicians, village development committees, pastoralists and other rural stakeholders with the most up-to-date and accurate information available on meteorological-related risks, so that disasters can be minimized or avoided, enhancing the capacity of all stakeholders to cope with and respond to climate change related hazards.
214. The sustainability of the investments in modernized water distribution and irrigation systems will be guaranteed by: (i) The change from diesel and electric pump sets to solar powered pumping units, which is expected to save between 25–30 MW/day from the national grid; (ii) the acquisition of micro-pressurized drip irrigation equipment, which will help maximise the use of scarce water resources; (iii) the training in solar technology and drip irrigation technologies provided to community groups in each settlement, which will ensure sustainability and will facilitate development of locally skilled cadre of youth trained in installation, maintenance and repair of efficient irrigation systems and solar technologies, helping the youth to gain marketable skills and engage in productive livelihoods.
215. The project will guarantee the sustainability of farming systems by enhancing their resilience through production diversification, reduced post-harvest losses and enhanced quality of produce. Another element of sustainability will be the empowerment of the cadre of extension workers and service providers established by the baseline SAIL to provide advice on innovative adaptation management systems and technologies for crop and livestock improvement for the target population. The set-up of a cadre of women Community-Based Livestock Extension Workers will add an additional element of sustainability to the extension service, given the central role played by Egyptian women in livestock. An additional element of sustainability of the extension effort will be the fact that the project will introduce a mechanism whereby the farmers will start paying for the services of the facilitators on a gradual basis. It is expected that once there is a critical mass of farmers who are organized, are producing more and have access to markets, the cooperatives will be more willing to hire the services of local extension workers.
216. The investments in climate-resilient value chain technologies and diversification strategies will enhance sustainability of the target beneficiaries, thanks to the access to finance and capital grants for the acquisition of new, more efficient technologies and equipment, and the acquisition of innovative adaptation production technologies, and post-harvest infrastructure to reduce losses in quantity and quality of produce as well as to enhance the control of the cooperatives over the market price.

VI. INSTITUTIONAL FRAMEWORK AND MANAGEMENT ARRANGEMENTS

a. Project Coordination and Supervision

217. IFAD will be responsible for the coordination and supervision of SCCF, in accordance with GEF standards and procedures. Supervision and implementation support will be a continuous process, involving ongoing communication and engagement with MALR, the project team, the managers of the baseline project, and other relevant stakeholders.

218. At inception, IFAD will review and update the Logical Framework of the project during a SCCF start-up workshop with the participation of representatives from all stakeholder groups, prepare the Overall Work Plan & Budget and fine-tune the first Annual Work Plan & Budget (AWPB), and prepare a supervision plan for the project's first 12-18 months. Thereafter, the project team will prepare each year a consolidated AWPB incorporating the five State AWPBs generated by SIUs for review and approval by the PSC, to be submitted in advance of the GoS annual budgeting process to ensure that sufficient counterpart funds are made available,
219. The project will be directly supervised by IFAD. The approach to supervision will be one of implementation support and assistance. Given that the project is dispersed in different regions of the country and it might not be feasible to visit each area every time, several special features are proposed in the supervision arrangements. The first of these is to have, on ground, a local rural finance specialist who will provide guidance to the project on an on-going basis and assist in removing any implementation bottlenecks in discussions with the various implementing partners under this component. This is all the more important given that rural finance is a major component of the project and that in the past rural finance components have been slow to disburse because of lack of on-ground support and discussions with the implementing agencies in a timely manner to identify the constraints and propose solutions.
220. The second approach, used cost-effectively, in some countries, is to adopt a country programme approach to supervision and field technical specialists to the country who will supervise certain elements common to all on-going projects such as gender and poverty targeting, participation of youth, monitoring and evaluation, financial management and strengthening of rural institutions, etc. In addition, a supervision mission will be fielded after every six months in the initial period and thereafter every year. The supervision mission will comprise technical specialists as required. The participation of Government representatives such as from the MALR, MOIC and other implementing partners will be encouraged in the supervision process. There is also a strong case for SAIL to have increased budgetary resources for supervision given its importance in Egypt's country programme and the NEN portfolio.

b. Project Implementation Arrangements

221. The delivery mechanism envisaged in the SCCF Project will rely on the project implementation arrangements established in the SAIL baseline project: a mix of public, private sector and community led institutions. The implementation approach will envisage a high degree of stakeholder participation and grassroots involvement in order to bring villagers, including women, youth and the less advantaged into an effective force for change and self-reliance. A diagnostic process will be adopted to work in close collaboration with rural households through their institutions such as the Community Development Associations, ACs, WUGs and FMAS. The Project approach will tailor project activities and services to the needs of the target beneficiaries and ensure their capacity to operate and manage the services for long-term sustainability. The Project will ensure close partnership with rural institutions in a manner that clearly identifies the roles and responsibilities of each implementing partner from the outset.
222. Project Steering Committee: A high ranking inter-ministerial Project Steering Committee (PSC) will be set up for overall policy decisions and guidance at the national level. The PSC will be chaired by the Minister of MALR or his representative, with members representing EEAA, the Ministry of International Cooperation, Ministry of Irrigation, representatives from the relevant line ministries such as Education and Health and Participants Financial Institutions (PFIs). The PSC will meet biannually, and on an ad-hoc basis when necessary. It will have the primary responsibility of guiding the Project implementation activities and in all matters of policy regarding the Project. Specifically, the PSC will: (i) ensure that Project activities are in compliance with the Government's policies; (ii) approve consolidated Project AWPB; (iii) allocate the microfinance funds to PFIs; (iv) oversee the effective coordination and synergy between the different components; (v) ensure that Project interventions are coordinated with other development programmes and Projects; and (vi) oversee and monitor the systematic implementation of the Project and recommend changes where necessary in coordination with IFAD.
223. Project Management Unit: The PMU will be headed by an Executive Director appointed by the Minister of MALR and acceptable to IFAD. The PMU will report to the Minister and to the Project Steering Committee. The PMU will be based at the International Centre for Development and Training (ICDT) in Amriya and will be in close proximity to the National Office of the Graduates on Newlands, which is also based in Noubaria. The PMU and the RPMU will have the main task for implementing and overseeing all project components with technical assistance and support from selected implementation partners. The PMU/RPMU will be responsible for the implementation of

the Community and Agricultural Development Components, as well as oversee the implementation of the Rural Finance Component and be responsible for the Project Management and Coordination.

224. SAIL will capitalize on the existing capacities and experience of WNRDP staff housed at ICDT, which will also ensure a quick start-up of Project activities in the Kafr-El-Sheikh area. The PMU will provide implementation support for certain Project functions such as financial management, procurement, monitoring and evaluation. The PMU will provide technical assistance, training and orientation to the newly recruited PMU/RPMU staff based on their experience in WNRDP. As an essential step towards ensuring continuity of staff during the project period, most of the Project staff will be recruited from the Project target area itself.
225. The PMU staff will comprise a Project Manager, a Community Mobilization Specialist, Civil Works Engineer, Marketing Advisor, Agricultural Extension Advisor, Gender & Poverty Targeting and Youth Advisor, National Credit and Enterprise Facilitation Specialist, Financial Manager, M&E Officer, Accountant and support staff. GEF funding will cover costs for a CC Adaptation Specialist who will be part of the PMU staff. All new Project staff will be recruited through open competition and be assigned to the Project on a full time basis. The Project will capitalise upon the experience of WNRDP by seconding qualified staff from the project to the SAIL Project.
226. The PMU will be responsible for coordination and liaison with implementing partners, the Government and Participating Financial Institutions, as well as overall Project programming, preparation of AWPBs, financial management including disbursement, procurement, preparation for audits, etc.), monitoring/evaluation and knowledge management.
227. The PMU will be responsible for ensuring the systematic collection of baseline data, monitoring and evaluation, progress reporting and liaison with the Government. It will also be responsible for providing logistical and administrative support to supervision missions, mid-term reviews and Project completion reports.
228. Where required, services of technical specialists and agencies will be recruited for specific tasks such as governance, strategic management and planning training as well as vocational and enterprise training. The PMU will recruit technical assistance based on performance-based contracts and oversee and supervise their work.
229. Regional Project Management Units: Three RPMU will be established in Lower, Middle and Upper Egypt that will coordinate and implement Project's activities in the selected settlements. Given its proximity to the ICDT, the RPMU for Lower Egypt will be based in the PMU. The RPMUs will have the primary responsibility for preparation of regional level AWPBs, identifying farmer organizations and strengthening them, ensuring participation of women, working closely with technical assistance, manage Project funds at the governorate level, monitoring and evaluation, reporting and providing support to supervision missions.
230. RPMUs will report to the PMU. Each unit will comprise a Regional Project Manager, who will be an specialist with relevant experience, authority and good networking capability with the farming community and other Project implementing partners. Other staff will include Agriculture Extension Officer, Livestock Specialists, Community Specialists and women and men Community Mobilisers, NRM Officer, Local Engineer, Market Facilitation Officer, M&E Officer, Regional Credit and Enterprise Facilitation Specialist, technical assistance for overseeing participation of women, accountant and support staff. Other short term staff might be recruited based on the Project's needs. RPMUs will send progress report to the PMU and maintain direct contact and interactions with relevant local level GOE agencies, private sector and civil society organizations involved with Project implementation.
231. Grant funding mechanism: the process of awarding grants to agriculture cooperatives and women-led enterprises will have to fulfill specific criteria as defined in the Project Implementation Manual (PIM). The manual will define procedures, criteria and procurement conditions for the project grants, addressing climate resilience and gender requirements. Grant funding will facilitate the generation and introduction of innovative climate-resilient technologies for agriculture production and will support the delivery of environmental services resulting from the crop value chains and diversification of livelihoods.
232. A competitive scheme for applications will focus on investments in equipment and technologies that are aligned with the project objectives to increase climate-resilience, addressing eligible farmers who participated in the capacity building programmes. The Project will also follow IFAD's "Gender Equality and Women's Empowerment policy" to increase the project's impact on gender issues –i.e. improve gender rating for grants' design; the proportion of matching grants for

women organizations or households headed by women. Specific indicators will be defined to measure the gender impact of the grants, such as: (i) increase in the proportion of grants with climate-resilience and gender-specific objectives supported by clear budget allocations; (ii) improvement on climate-resilience and gender ratings for grant portfolio and completion; (iii) increase in the number and quality of climate-resilient value chain and income diversification grants supporting gender equality and women's empowerment; (iv) USD value of grants to women-led small-enterprises supporting climate-resilient equipment and technologies; etc.

233. The PMU/RPMU will prepare ToRs and conditions for applicants that will be published in local mass media and online. Following current basis for the country IFAD's operations, the applications submitted will follow a two-step selection process of pre-qualification and qualification through a field review and final scoring by an Application Evaluation Committee (AEC). All the goods shall be procured through National Competitive Bidding (NCB). The project team will screen and evaluate all applications, and successful grantees will receive the required technical assistance to make an efficient use of the new equipment and technologies, following climate-resilience principles. The project's support to innovative approaches will not only help small farmers increase the returns and income from agricultural production, but will also increase the number of farmers engaged in climate-resilient agriculture and income diversification beyond the training programmes and demonstration FFS.
234. The Project will provide training to the staff and committees involved in the grant portfolio to ensure their capacity to assess and monitor the climate-resilience and gender criteria of the grants' portfolio. Training will be delivered prior to processing the first applications and after finalization of the PIM. Ad hoc or refresher training may also be provided.

VII. PROJECT COST AND FINANCING

a. Financing and Co-financing

235. The SCCF project will be fully embedded into the baseline SAIL Project. Total project costs are estimate at USD 45,944,600 over a seven-year implementation period. The financial sources are: GEF resources of USD 7,812,000; IFAD resources of USD 38,132,600 in the form of a soft loan (USD 32,379,000) and two grants (USD 5,753,600).
236. The following table provides the project costs funded by GEF by components. The total details of co-financing are provided in the project COST TABLES.

Table 9. Project costs funded by GEF

Project components and sub-components	SCCF
Component 1 – An enabling policy environment for planning and implementing climate-resilient agriculture in the reclaimed lands	
OT 1.1 <i>Climate change adaptation measures for agriculture production in reclaimed lands are mainstreamed into relevant policy frameworks and decision-making tools</i>	941,000
Sub-total Component 1	941,000
Component 2 – Optimized irrigation water management at the tertiary and on-farm levels	
OT 2.1 <i>Water users are enabled to design and implement optimal cropping patterns and climate-resilient irrigation plans</i>	493,050
OT 2.2 <i>Investments in modernized water distribution and irrigation systems allow farmers' associations to make an optimized use of water</i>	3,104,550
Sub-total Component 2	3,597,600
Component 3 – Climate proofing of crop value chains and diversification of local livelihoods	
OT 3.1 <i>The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed</i>	1,375,400
OT 3.2 <i>Beneficiaries have improved agriculture production and market competitiveness through investments in climate-resilient value chain technologies and diversification strategies</i>	1,526,000

Sub-total Component 3	2,901,400
C 4 - Project Management	
Sub-total Component 4	372,000
Total	7,812,000

b. Financial Management, Procurement and Governance

237. To determine project specific control risks, a financial management risk assessment of the baseline SAIL project and its fiduciary arrangements has been completed. This assessment included MALR, SFD and ADP. The assessment found that the financial management arrangements of these institutions were in accordance with principles of good management and all were subject to internal and external audits. However, MALR was not using a computerized system for recording its accounts but was willing to install such a system for the proposed project. This system will need to be customized to provide the requisite information to IFAD.
238. The SAIL project will have a single designated account and will present audited consolidated financial statements on all the activities of the project within 6 months of the financial year end. Disbursements to the implementing partners of the Social Fund for Development and the ADP will be made by the PMU. A Flow of Funds chart has been developed and provided in Appendix 7. The authorized allocation to the designated account will be sufficient to allow 6 months of eligible projected expenditures. The first disbursement which will be made before disbursement conditions have been met will be limited to USD100,000 in order to allow the start-up of the project. The second disbursement to complete the authorized allocation will be conditional upon the purchase and implementation of a fully-fledged financial management system and the preparation of a Project Implementation Manual with a section on Financial Management. Furthermore, implementation agreements will be concluded with SFD and ADP before any advances is paid to them.
239. The Public Procurement law (PPL) regulates Egyptian public procurement and is based on the principles of fair competition and non-discrimination but allows for domestic preferences or tenders offering domestic goods and services. Egypt has been identified by the World Bank & IFC's Doing Business 2014 as a top reformer in the area of public procurement. However, the report notes that the government has been modest in implementing the needed changes effectively. Egypt's overall procurement capacity, assessments by IFAD indicate that the procurement capacity is moderate in the areas of managing the bidding process, procurement planning and contract management.
240. In accordance with IFAD's procurement guidelines approved by the IFAD Executive Board in September 2010 and the provisions of the General Conditions, procurement of goods, works and services conducted by PMU/RPMU, ADP, SFD and participating banks under CIB and financed by IFAD loan/grant will be carried out in accordance with the provisions of the borrower's procurement regulations, to the extent consistent with the provisions of IFAD procurement guidelines. For each contract to be financed by IFAD proceeds, the types of procurement methods, estimated cost, prior review requirements and time-frame will be agreed between the Project and IFAD respectively in the Procurement Plan (Appendix 8 Procurement).

ANNEXES

ANNEX 1 - MONITORING AND EVALUATION

I. Monitoring and Reporting

241. **Role of M&E in results-based project management.** The main objectives of M&E are: (i) to provide timely and accurate information on implementation progress and constant feedback into the Management Information System (MIS) for decision-making and addressing potential plan deviations and problem areas; (ii) to evaluate the performance of implementing agencies and service providers; and (iii) to assess achievements at the levels of outcomes and impact. Project monitoring and evaluation will be conducted in accordance with established IFAD and GEF procedures. In line with the GEF/SCCF operational principles, the SCCF M&E activities will be country driven and provide for consultation and participation in a decentralized manner, actively involving target groups and service providers, who will be duly informed about the plans, implementation and the results of evaluation activities.
242. The main objective of the proposed SCCF project will be to lessen the impact of climate change on vulnerable rural groups as well as on the natural resources critical for crop and livestock production, thereby increasing food security. The project will undertake a baseline assessment and participatory resource mapping exercise in village, including a rapid vulnerability assessment, to define the baseline status prevalent before the initiation of the project activities in the project areas. Basic data and information relevant to the project will be collected, and project indicators will be measured at this stage.
243. The M&E system will be designed to offer comprehensive and reliable information to improve planning and decision-making for results-based management. The logical framework will constitute the basis for results-based M&E. The M&E system will have a three-tier structure: (i) output monitoring with focus on physical and financial inputs, activities and outputs; (ii) outcome monitoring assessing the use of outputs and measure benefits at beneficiary and community levels; (iii) impact assessment assessing project impact for the target group in comparison with objectives. All M&E data, analysis, and reporting will be disaggregated by gender. All M&E activities will be based on IFAD's Guide for Project M&E.
244. The SCCF intervention will be fully blended with the IFAD baseline operations (SAIL Project) so they will share the monitoring and evaluation system. The overall responsibility for M&E activities will rest with the M&E Officer, based at the Project Management Unit (PMU), and reporting to the Project Director. The M&E Officer will establish a data collection, analysis and reporting system to track physical and financial performance and emerging impact.
245. The Project will conduct, at its onset, a Start-up Workshop, with the aim of sensitizing and training the MOIC, MALR, the PMU/RPMUs, and other potential implementing partners. The project's logical framework will be reviewed at a Start-up Workshop. The Project team will fine-tune the progress and performance/impact indicators of the project at the Inception Workshop with support from IFAD and project partners. Specific targets for the first year of implementation, progress indicators, and their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team.
246. Periodic monitoring of implementation progress will be undertaken by IFAD. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities. A part of the participatory M&E will be devoted to ascertain the extent of women's participation in project activities, constraints faced, benefits gained, aspirations met and impact on women's status in the family, their involvement in community affairs and the climate-proofing of their agriculture. Measurement of impact indicators related to adaptation benefits will occur according to the schedules defined in the Inception Workshop. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions, or through specific studies that are to form part of the projects activities, or periodic sampling.
247. **Reporting.** Harmonized project progress reports will be produced quarterly, semi-annually, and annually. Reporting progress will be made available for each of the five target States as well as consolidated for the whole project area.

248. Two Mid-Term Reviews will be undertaken in PY3 and PY5 covering: (i) physical and financial progress in comparison with the annual work plans and budgets (AWPB); (ii) performance assessment of service providers; (iii) institutional and national policy changes arising from project activities; (iv) opportunities for deeper integration of implementation within national systems; and (v) overall progress towards the achievement of project objectives. At the end of the project, a Project Completion Report will be prepared by the Government, with IFAD support, to examine the overall project performance, taking into account a broader and longer-term perspective.
249. The project will use locally adapted RIMS (IFAD Results and Impact Management System) surveys at baseline, mid-term and completion, as the main quantitative survey tool to provide information on three levels of results: (1st) project activities and outputs; (2nd) project outcomes, reflecting changes in beneficiaries behaviour, improved performance and sustainability of groups, institutions and infrastructure; (3rd) project impact on child malnutrition and household living standards. Ad hoc surveys, qualitative case studies and thematic reviews will be outsourced to independent institutions to verify results and draw lessons on themes such as climate resilience and adaptation, market access, community empowerment, infrastructure development and food security improvement.
250. **Learning and Knowledge Management.** The SCCF operations will create valuable knowledge in climate resilience and adaptation on natural resources management, crop and livestock management, income diversification, community empowerment, infrastructure development and food security improvement, which will be captured by the PMU/RPMUs and utilized to generate lessons and best practices to be shared with public institutions, the IFAD country team, partners and others. In terms of Knowledge Management, operational experiences will create valuable knowledge in the target areas, which will be captured and utilized to generate lessons and best practices to be shared with beneficiaries, public institutions, the IFAD country team, partners and others.
251. The project will promote: (i) knowledge networking through periodic seminars/workshops; (ii) publication of 'how-to' leaflets, and (iii) audio-visual material that capture lessons learnt and impact. Special emphasis will be placed on knowledge regarding climate change adaptation and climate-risk reduction. The vulnerability assessments to be undertaken at village level will be the basis for that, ensuring it guides adaptive long-term planning regarding development work in the reclaimed lands. Main anchoring points for knowledge management will be identified, including research institutions, civil society, regional KM networks and specialised service providers. The project will also promote: (i) in-country knowledge networking through periodic seminars/workshops; (ii) regional knowledge networking, such as the regional network on Knowledge Access for Rural Inter-connected Areas (KariaNet) for the management and sharing of knowledge, information and experience in agriculture and rural development in the Middle East and North Africa (MENA); and (iii) regional research networks including those supported by IFAD grants.

II. Evaluation

252. Mid-term Evaluation - An independent Mid-Term Evaluation will be undertaken at the end of project year 3 and project year 5 of implementation. The Mid-Term Evaluation will take the form of a qualitative study to determine the progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the project's term, including the revision of indicators if needed. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by IFAD.
253. Final Evaluation - An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by IFAD. The final evaluation will be carried out in a synergetic and coordinated fashion with Final Impact Evaluation that will be carried out for the baseline project SAIL to assess: (i) Project effects and impact; (ii) sustainability of those effects; (iii) potential for upscaling Project activities; (iv) lessons learned from implementation and recommendations for

follow-up interventions; and (v) SAIL's outcomes and impact contributing to the achievement of national objectives in the rural sector.

Monitoring and evaluation plan and budget

Type of M&E activity	Responsible Parties	Budget US\$ (SCCF contribution) Excluding project team Staff time	Time frame
Inception Workshop (IW) and report	GEF Coordinator/ PMU/SIUs	USD 10,000	Within first two months of project start up
Annual Progress Report (APR) and Project Implementation Report (PIR)	Project Team IFAD		Annually
Tripartite Review (TPR) and TPR report	Steering Committee Project team IFAD		Every year, upon receipt of APR
Steering Committee Meetings	Project Coordinator IFAD		Following Project IW and subsequently at least once a year
Two Mid-term Evaluations	Project team IFAD External Consultants (i.e. evaluation team)	USD 25,000	At the mid-point of project implementation.
Final External Evaluation	Project team, IFAD External Consultants (i.e. evaluation team)	USD 25,000	At the end of project implementation
Terminal Report	Project team IFAD External Consultant		At least one month before the end of the project

ANNEX 2 – RESULTS FRAMEWORK (LOGFRAME)

Logical Framework

Narrative Summary	Key Performance Indicators	Means of Verification	Assumptions/ Risks
Project Goal			
<i>Increase food security and incomes for poor rural women and men through climate resilient agriculture.</i>	<ul style="list-style-type: none"> 60% HH have increased climate resilience. 40% HH have improved asset ownership index compared to baseline (RIMS). 	<ul style="list-style-type: none"> RIMS baseline and impact surveys. UNICEF/WFP food security surveys. Government statistics. 	<ul style="list-style-type: none"> Stable political and security situation. Macro-economic conditions improve.
Project Development Objective			
<i>Enhance farmland productivity and income diversification in the reclaimed lands.</i>	<ul style="list-style-type: none"> Average income of 24,000 target HH increase by 40% at Project completion. At least 40% farmers reporting production/yield increase at Project completion. 	<ul style="list-style-type: none"> RIMS, baseline survey, mid-term and completion assessments. Governmental surveys and reports. 	<ul style="list-style-type: none"> Conducive government policies. Stability in agriculture prices.
Component 1: An enabling policy environment for planning and implementing climate resilient agriculture in the reclaimed lands/ Contributes to CCA-1 and CCA-3 Total GEF Budget: USD 941,000			
Outcome 1.1: CC adaptation measures for crop production in reclaimed lands are mainstreamed into relevant policy frameworks and decision-making tools.	<ul style="list-style-type: none"> 20 staff members from relevant governmental institutions and departments (MALR, EEAA, EMA, CLAC, CCICRE) have acquired knowledge on CC downscaling methodologies to analyze CC impacts and adaptation needs on agriculture and irrigation water use in the target areas. Relevant policy documents (e.g. CC Adaptation Technology Needs Assessment) and progress reports to Regional Initiatives for CC impact assessment on water and agriculture prepared by EEAA in collaboration with other relevant institutions, and based on project results. Relevant MALR policy frameworks have mainstreamed CC adaptation for land and water management in agriculture production in the reclaimed lands. A Dynamic Agriculture Information and Response System (DAIRS) to support farmers in effective planning and preparedness to overcome climate-related risks is developed by MALR, tested in the target areas, and become operational at the national level through a sustainable public-private partnership agreement. 	<ul style="list-style-type: none"> National and State level statistics and inventories. Policy documents and strategies. MoU between MALR and private institution for management of DAIRS. 	<ul style="list-style-type: none"> All key public and private stakeholders are willing to engage in development and implementation of measures for vulnerability reduction. DAIRS embedded and budgeted properly in Government services.

Narrative Summary	Key Performance Indicators	Means of Verification	Assumptions/ Risks
Component 2: Optimized irrigation water management at the tertiary and on-farm levels / Contributes to CCA-1 and CCA-2 Total GEF Budget: USD 3,597,600			
Outcome 2.1: Water users are enabled to design and implement climate-resilient irrigation plans.	<ul style="list-style-type: none"> Optimal cropping patterns and efficient irrigation plans are developed for selected VCs in the 4 target areas. 7,400 farmers are trained on the designing and implementation of climate-resilient cropping patterns and irrigation plans. 4,200 members of WUGs are trained in new irrigation technologies and management systems. 	<ul style="list-style-type: none"> Baseline reports and rangeland productivity records. Field questionnaires. 	<ul style="list-style-type: none"> Key concerned stakeholders are willing to engage in the project activities. Adequate knowledge, expertise and tools are available.
Outcome 2.2: Investments in modernized water distribution and irrigation systems allow farmers' associations to make an optimized use of water.	<ul style="list-style-type: none"> 24,000 HH have access to rehabilitated/modernized irrigation schemes. Efficient irrigation systems established in 25,000 ha. 22 aquaponic and hydroponic pilot farms are established in the 4 target areas. 	<ul style="list-style-type: none"> HH income surveys. Interviews/focus groups. Project monitoring reports. 	<ul style="list-style-type: none"> Target HH and other key actors are willing to become involved. The project can secure the required technical capacity. Suitable technologies are available in the country.
Component 3: Climate proofing of crop value chains and (income improvement) diversification of local livelihoods / Contributes to CCA-1 and CCA-2 Total GEF Budget: USD 2,901,400			
Outcome 3.1: The adaptive capacity of local practitioners and organizations to mainstream CC adaptation along value chains is developed.	<ul style="list-style-type: none"> 24,000 practitioners are trained on CC adaptation agronomic systems and technologies. The members of at least 50 CDA and ACs are trained on climate-resilient VC technologies. About 40 farmers (50% women) are trained as facilitators and extension providers to support FFS. 	<ul style="list-style-type: none"> Training evaluation forms. Interviews/focus groups. Project M&E system 	<ul style="list-style-type: none"> All concerned actors are willing to engage in development and implementation of capacity building and to participate in FFS. The project is able to provide relevant TA.
Outcome 3.2: Beneficiaries have improved agriculture production and market competitiveness through investments in climate-resilient VC technologies and diversification strategies.	<ul style="list-style-type: none"> 60% beneficiaries report improved production and marketing based on climate-resilient technologies. 100 agriculture cooperatives access grants for climate-resilient production, processing and diversification equipment. 200 women-led small-enterprises access grant funding for climate-resilient income diversification opportunities. 	<ul style="list-style-type: none"> Interviews/focus groups. Companies register books. Project M&E system. 	<ul style="list-style-type: none"> No major conflicts in the villages to prevent the communities from collaborating with each other. Suitable equipment and inputs are available in the country.

ANNEX 3 – PROJECT COST TABLES

The full COSTAB is provided in a separate hand-out

ANNEX 4 – TERMS OF REFERENCE

1. Natural Resources & CC Adaptation Specialist (NRAS)

SCCF will hire a full-time national professional to serve as the Natural Resources & Adaptation Manager (NRAS). Within the team in charge of the implementation of the SAIL, the NRAS will lead the design, development, implementation and monitoring of all the NRM and climate adaptation work embedded in the Project, in close coordination with all Components of the baseline project SAIL. The NRAS will report to the Project Director of the SAIL and will work in close collaboration with the other members of the management team, namely: Financial Controller, Logistics/Procurement Officer, KM/M&E Officers, Senior agronomists. The NRAS will also interact frequently with her/his counterparts at MALR and de-centralized structures.

The NRAS will support the Project Director (PD) in the following work: (i) facilitate preparation and consolidate AWPB and get approval from PMU, MALR, and IFAD; (ii) help run the financial management and procurement of SAIL in a smooth and effective fashion; (iv) provide timely quarterly progress reports of all Project activities to the PSC; (v) organize the baseline and reference surveys and other studies; (vi) ensure technical quality of Project activities, (vii) coordinate and supervise the work of the providers of international TA; (viii) ensure requirements with respect to targeting of the IFAD target group are met; (ix) ensure reporting and M&E of Project performance and RIMS; (x) provide support to Project Implementation Units; and (xi) safeguard Project funds and assets.

The NRAS will have the following tasks:

1. Support the Project Director in the selection and hiring process for the NR & Adaptation staff, all the national and international TA required for the implementation of the NR/climate adaptation related work, drawing specific terms of reference, preparing detailed work plans, and agreeing on the exact nature and timing of the deliverables with each provider of TA. The NRAS will act as the focal point for all the TA and will closely monitor their work, making sure it is fully embedded in the overall work plans of SAIL.
2. Ensure that the State and locality level teams have all the logistic, technical, and capacity building support required for the successful development, design, and subsequent implementation of the adaptation measures by the CDAs;
3. In collaboration with colleagues from SAIL, identify and hire the service providers contracted for the Technical Assistance (TA) in each target region to: (i) lead the production of the baseline, including vulnerability assessment at the cluster level; (ii) undertake participatory mapping of the natural resource base of rural communities, identify risk, hot spots and investment gaps to inform the selection of suitable adaptation measures; (iii) support the TA in the delivery of technical training; (iii) provide backstopping and technical support for the assessment and implementation of the CDAs' adaptation measures; and (iv) ensure that climate change adaptation and vulnerability reduction are solidly embedded in the priority investments.
4. Develop partnerships and establish links with organisations, institutions, and research centres in Egypt to gather information and data on achievements, best practices, lessons learned, and develop synergies with other projects/actions in the field of NRM/climate adaptation. Make sure that these data and information flow through the SAIL governance structure and inform the project implementation process;
5. Supervise the work of the national/international TA and make sure that it delivers effective, relevant, and timely training and capacity building;
6. Pay visits to the fields, visiting a reasonable number of CDAs in each target region;
7. As part as the personal capacity building process, during the first 2 years of SAIL visit at least one successful experience of NRM/climate adaptation project within Egypt or the wider region. Seek the support of IFAD's NEN and ECD to identify suitable best practices for the visit.
8. In collaboration with the rest of the SAIL team, lead the development of the Knowledge Management component of the work, choosing the most appropriate tools for knowledge sharing and supervising their production and dissemination.

- Support the MALR in drafting the final TOR, and organise the advertising and hiring process to identify the most suitable TA for the implementation of the Dynamic Agriculture Information and Response System (DAIRS). Take active part in the initial stages of DAIRS design and development, ensuring that all the proper partnerships and collaboration with Egyptian institutions are in place, and that a clear and feasible work plan is agreed for the delivery of the DAIRS, among all concerned parties. Support the TA in the mapping of relevant/similar efforts happening in EGYPT in the field of Early Warning Systems (EWS), engage with the implementation agencies to explore opportunities for synergies and collaboration. Monitor closely the implementation process and support the providers of TA during their visits to Egypt. Liaise with the other components of the Project, so as to make sure that all stakeholders, beneficiaries and Project partners get the maximum benefit from the outcomes and deliverables linked to this activity.
- Work in close liaison with the MALR, and support the design and development of the policy documents and policy frameworks. Support the MALR in the hiring of the international and national TA to facilitate a consultation process and organise a series of national workshops that will eventually lead to the policy formulation. Ensure coordination with the relevant government agencies and partners, both at central and state levels.

Qualification Requirements for the NRAM Position

The specialist required for the position of Natural Resources & Adaptation Specialist will have following skills and profile:

- Academic background on natural resource management, rural development, agriculture, or biology.
- At least five years of experience in the field of Environment and Natural Resource Management, possibly in the field of agro-ecosystem management.
- At least five years of experience in the implementation of rural development and/or climate adaptation and vulnerability reduction projects in Egypt or other countries of the wider region.
- Good knowledge of the national policy and institutional framework related to rural development, natural resource management, poverty alleviation, and climate change adaptation in Egypt, possibly in relation with the agriculture sector.
- Familiarity with all the governmental and non-governmental actors and stakeholders involved in rural development, sustainable agriculture management, natural resource management, and climate change adaptation work in Egypt.
- Proven experience in the leadership and coordination of multidisciplinary teams, and in the planning, implementation and monitoring of complex projects.
- Good knowledge of the past and ongoing projects and initiatives on rural development, NRM, or in Egypt and more widely in the region.
- Excellent and proven presentation, facilitation and negotiation skills.
- Good knowledge of communication tools and technologies (internet, web sites).
- Fluency in oral and written English is a must. Ability to think broadly and intersect orally.

ANNEX 5
**Climate Change Vulnerability Assessment & Awareness for small-scale
farmers in Rural Areas in Egypt**

(Separate File)

ANNEX 6 –REFERENCES

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