

Mid-Term Evaluation

**Building Resilient Food Security Systems to Benefit the Southern
Egypt Region project**

Final Report

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Project Basic Information

Project Category: Regular Program

Country: Egypt

Title of Project: Building Resilient Food Security Systems To Benefit The Southern Egypt Region

Type Of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: United Nations World Food Programme

Executing Entity: Ministry Of Agriculture, With The Ministry Of Environment

Project Duration: 4 Years

Project Budget: Us\$ 6,904,318

Units Used

Ardab 150 Kg

Acre 4046.86 m²

Hectare 1000 m²

Kirat 175 m²

Feddan 4200 m²

24 kirat

0.42 ha

1.038 acres

ACAS *Agricultural Climate Adaptation Strategy*

Abbreviations

AF	<i>Adaptation Fund</i>
ARC	<i>Agricultural Research Centre</i>
CLAM	<i>Central Laboratory for Agro-metrology</i>
CMS	<i>Climate Monitoring Stations</i>
DAC	<i>Development Assistance Committee</i>
EACDP	<i>Executive Agency for Comprehensive Development Projects</i>
EEAA	<i>Egyptian Environmental Affairs Agency</i>
EMA	<i>Egyptian Meteorological Authority</i>
FGD	<i>Focus Group Discussion</i>
ICDL	<i>International Computer Driver's License</i>
MALR	<i>Ministry of Agriculture and Land Reclamation</i>
MTE	<i>Mid-Term Evaluation</i>
NGO	<i>Non-Governmental Organization</i>
OECD	<i>Organization for Economic Cooperation and Development</i>
PM	<i>Project Management</i>
SE	<i>Southern Egypt</i>
SOP	<i>Standards of Operations</i>
UNFCCC	<i>United Nations Framework Convention on Climate Change</i>
WFP	<i>World food Programme</i>
WB	<i>World Bank</i>

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1. Introduction

1.1. Context

Egypt has a growing population (currently 87.9 million and expected to exceed 120 million by the year 2020¹). Food security is threatened by limited water resources (current per capita water resources are 630 m³), and arable land resources (only 3.5 percent of total land area). Land resources are further threatened by a number desertification factors. Most of Egyptian land is desert. Only 3.5 percent of its land area is arable with the total cultivated land reported as 8 million acres of “old” land in the Nile Valley and 2 million acres of reclaimed land. Expansion through land reclamation is limited by water scarcity and inefficiency of water use. Moreover, Egypt is one of the world’s most vulnerable countries to the potential impacts of climate change.

Figure I: Egypt Governorates
(Southern Egypt/Project Area: Asiat, Suhag, Qina, Luxor and Aswan)

¹ The Egyptian Center for Public Opinion Research-Basira, 2015



In addition to the abovementioned geographical and climatic factors, the agriculture sector in Egypt faces serious challenges, first and foremost among which are extreme land fragmentation, poor agricultural practices, shortage of proper and new varieties, shortage and poor quality of agricultural inputs as well as poor post-harvest and processing facilities. This resulted in increasing food insecurity at both macro and micro levels. On one hand, Egypt's agricultural production has not kept pace with its growing population, and the country remains a net food importer. On the other hand, farmers' income witnessed significant decreases and poverty rate in rural areas increased.

Southern Egypt, in particular, faces some of the worst climatic shocks; heat and frost waves are generally more frequent, intense, and unpredictable in Southern Egypt. Resulting crop failures have been on the rise in the zone. Although no official data is published to quantify crop losses from more erratic weather, failures of fruits and vegetables, and the effect on prices, are widely reported in the media, and are of increasing concern to producer groups. The region is expected to continue to suffer from the highest rates of temperature rise (up to 1.5-2o C on average by the year 2040²).

² Egypt Second National Communication (ESNC) EEAA May 2010; and World Bank (2009). Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department Report.

Subsequently, food production is comparatively lower in the Southern zone than elsewhere in the country. The higher temperature of the zone is a key factor contributing to lower agricultural productivity. The climate-impacted environment is forcing people to overexploit their already stressed natural resources, mainly land and water, to compensate for low productivity. Moreover, low productivity is one of the key reasons for chronic poverty, preventing people from investing to enhance their productivity through the provision of input and maintenance of land, leading to further deterioration of the resource base and ultimately incomes.

Southern Egypt risks to lose at least 30 percent of its food production by 2050 as a result of climate change impacts, including reduced crop and livestock productivity, increasing crop-water demand and reduced water use efficiency, increase in pest and disease infestations, and institutional weaknesses. The socio-economic impacts of this climate change-induced food insecurity may be significant on the communities of Southern Egypt. Studies indicate that a reduction of approximately \$580 and \$1380/acre would occur on annual farm revenue with temperature increases of 1.5°C and 3.6°C, respectively, if no adaptation efforts were undertaken. For a household that relies on agriculture for a living (55 percent of the region’s households), this reduction can represent up to 80 percent of its total income. As a result, livelihoods of the already economically- stressed smallholders of the region will be at stake.

In response, the Government of Egypt represented by the Executive Agency for Comprehensive Development Projects (EACDP) and the World Food Programme (WFP) in 2013 started implementing the four years project “Building Resilient Food Security Systems to Benefit the Southern Egypt Region”.

Officially, the project was launched in March 2013, however, due to some contextual conditions, the project activities actually started approximately one year later.

According to the project document, a Mid-Term Evaluation has been conducted in August-September 2015. The document at hand reports the outcome of this evaluation.

1.2. Project Description

1.2.1 Project design

The project design has two components:

Component 1: Adaptation to climate change through technology development and transfer.

Component 2: Capacity building for climate knowledge and adaptation replication

The following Results matrix illustrates the project design.

Table 1: Project Results Matrix

	Indicator	Baseline	Target for Project End
Overall Objectives:			
1. <i>Improving the adaptive capacity of the Southern region of the country in the face of anticipated climate-induced reduction in food production</i>			
2. <i>build institutional capacity at all levels to enable sustainability and replication</i>			

Objective Indicator	Proportion of SE farming communities that are more climate resilient through adoption of water efficient irrigation, risk reduction measures in agriculture and livestock, diversified income sources, and access to early warning systems and adaptation guidance	Over 90% of southern Egypt rural inhabitants are vulnerable to climate change and variability and demonstrate low level of knowledge of risk reduction measures	Over 50% of SE farming communities practice risk reduction measures
Outcome 1: Improved adaptive capacity of the Southern region of the country in the face of anticipated climate-induced reduction in food security through asset creation, knowledge/technology transfer, and capacity/skills development			
Outcome Indicator 1	Percentage of target population in SE demonstrating knowledge of climate change and variability and means to reduce risk to their livelihoods	30% of sample interviewed as part of the baseline assessment knew about climate change with varied levels of understanding	Over 90% of target population understand climate change phenomenon, risks to livelihoods, and adaptation solutions
Outcome Indicator 2	Number of people adopting optimal efficiency in irrigation using low-cost technologies Such as canal lining and other surface irrigation low-cost solutions	More than 90% of people reported doing clearing of irrigation canals Less than 1% reported adopting any other measures to conserve water	Over 20,000 direct and 28000 indirect people adopting optimal efficiency in irrigation using low-cost technologies
Outcome Indicator 3	Water user associations established and active in effective management of water resources and waterways	No. water associations available	A minimum of 12 water user associations established and actively operating
Output 1.1: Community level mobilization and climate adaptation planning			
Output Indicator 1.1.1	Number of people participating in awareness sessions and mobilized to participate in project activities	over 1500 people, who participated in the baseline survey	Over 130,000 people participating in awareness sessions and mobilized to participate in project activities
Output 1.2: Establishment of a climate change and adaptation online application/system			
Output Indicator 1.2.1	Number of people using the climate change and adaptation online application	Zero, because no such system was in place	Over 100 direct participants in Cairo and participating governorates trained to use the system

Output Indicator 1.2.2	Number of people benefiting from the system with climate information, early warning and adaptation guidance	Zero, because no such system was in place	Over 130,000 direct beneficiaries from the system and over one million indirect beneficiaries from the potential scale-up of system use
Output 1.3: Introduction and use of water saving irrigation and other adaptation techniques			
Output Indicator 1.3.1	Number of acres benefiting from optimal irrigation efficiency using low-cost solutions.	Less than 1%	Over 4000 acres directly benefiting from optimal irrigation efficiency using low-cost solutions
Output Indicator 1.3.2	Proportion of target communities benefiting from adequate services of water users associations.	Zero because no water users associations were established in the target zone	All canals undergoing improved irrigation efficiency benefit from water user associations established and strengthened under the project
output 1.4: Introduction and use of water saving irrigation and other adaptation techniques			
Output Indicator 1.4.1	Number of people from among the target population benefiting from demonstration farms, extension services, and farm-to-farm visits to enhance their resilience and reduce climate risks.	None of the population were benefiting from any interventions for this purpose	Over 37,000 people directly benefit and over 100,000 indirectly benefit from access to heat resistant strategic plants, as well as learn how to change sowing dates, and other soft techniques to reduce climate risks
Output Indicator 1.4.2	Number of people engaged in income diversification strategies to reduce risks and vulnerability of food security to climate.	Less than 5% of people are engaged in income diversification strategies.	The above figure includes about 10,000 beneficiaries are engaged in income diversification schemes (intercropping, high value crops, and/or organic farming)
Output 1.5: Building resilience through livestock and poultry production			
Output Indicator 1.5.1	No. of women trained on risk reduction in raising large ruminants, small ruminants and poultry; animal nutrition and alternative fodder.	Zero women trained on climate risk reduction to livestock	Over 36,000 women trained on reduction techniques of climate risk to livestock
Output Indicator 1.5.2	Proportion of women accessing adequate vet services in their villages as it relates to climate related risks and diseases.	About 98% of respondents to the baseline survey indicate inadequacy of vet services in their villages	Over 90% of women engaged in raising livestock will have access to proper vet services equipped to reduce climate risk
Output Indicator 1.5.3	Number of women benefiting from small loans to acquire heat tolerant	No access to specialized livestock	18,200 women have access to specialized livestock revolving

	livestock varieties.	financing schemes is currently available in target communities.	schemes during project life
Outcome 2: Government more committed to investing in – and sustaining – climate risk reduction strategies and measures			
Outcome Indicator 2.1	% increase in budget allocated to adaptation in local, regional and national plans.	Zero	A positive trend sufficient to sustain and scale-up interventions of this project
Outcome Indicator 2.2	Key institutions needed capacity development to deliver services for climate risk reduction in rural communities	No programs or staff dedicated to adaptation services in key local governmental and non-governmental institutions.	Government programs developed to deliver: <ul style="list-style-type: none"> • Climate information hubs to scale up use of systems developed under output 1.2 • Adaptation knowledge and services embedded in government extension services Revolving funds extending beyond the project areas to benefit other communities in SE aiming to spread water conservation technologies and heat tolerant varieties in agriculture and livestock
Output 2.1: Training of government technical staff			
Output Indicator 2.1.1	Number of people trained; % of trainees that are able to properly retain message from training.	Training programmes for government on climate risk management to benefit rural communities will still be developed	Software developed and launched nationally to link climate stations belonging to different government agencies together, and developing adaptation guidance for each climate scenario for use by online users nationwide
Output Indicator 2.1.2	Number of advocacy meetings	Zero	300 officials at local and central government, as well as parliament, aware of climate proofing agriculture and water management
Output 2.2: Documentation of lessons learned and best practices			
Output Indicator 2.2.1	Number of awareness materials printed	No materials are produced on climate risk reduction in	At least five different printed products At least 4 different press releases issued

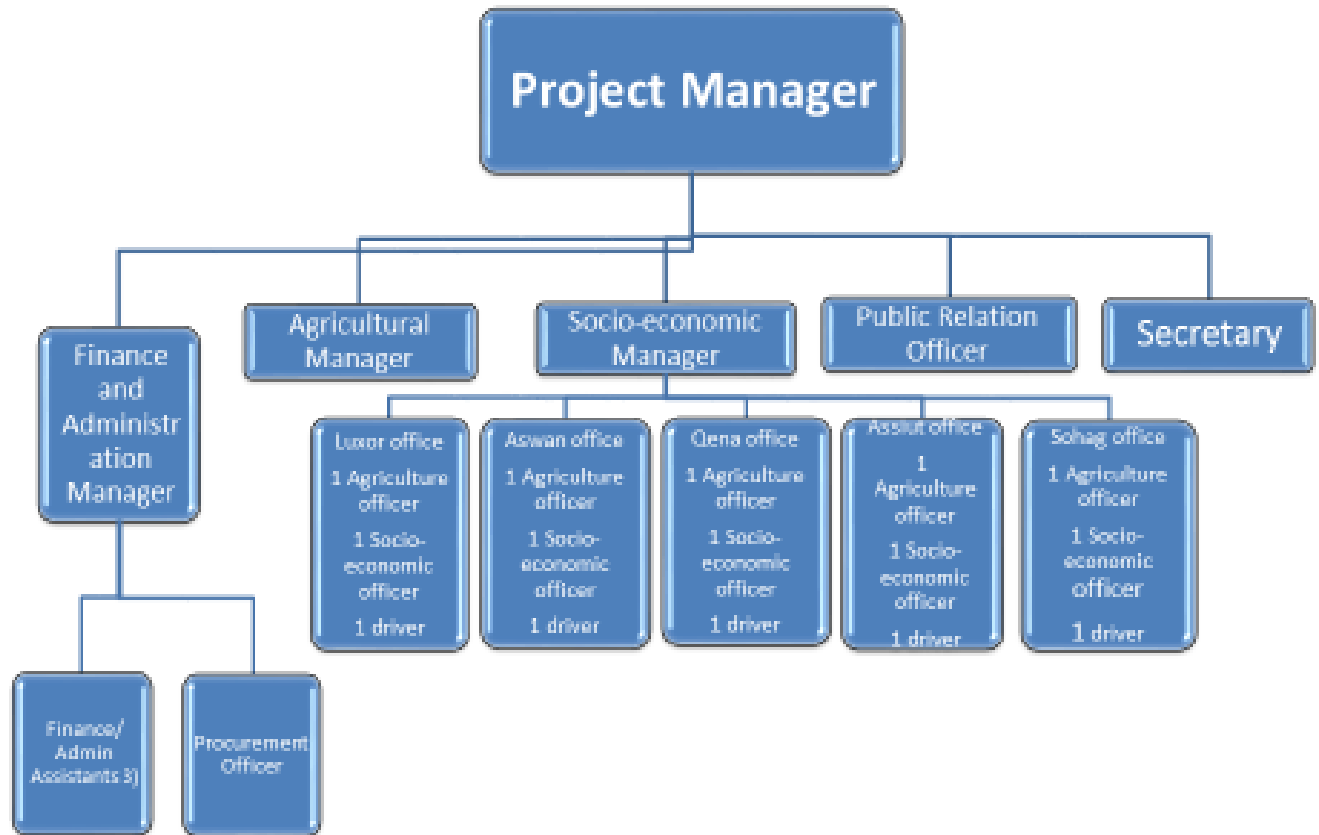
		agriculture	
Output Indicator 2.2.2	Number of online messages	Zero	At least 10
Output Indicator 2.2.3	Number of TV spots and programmes aired.	Zero	At least 10 TV spots produced and aired At least 10 radio spots produced and aired
Output 2.3: Sharing project results and lessons learned and mainstreaming new approaches in local and regional planning			
Output Indicator 2.3.1	Number of awareness and advocacy events held for new parliamentarians and policy makers.	Zero	At least 10
Output 2.4: Universities integrate climate adaptation solutions into their academic curriculum			
Output Indicator 2.4.1	Number of students benefiting from lessons learned from project interventions	Zero	300 yearly from the 3 key universities in Southern Egypt

Source: Extracted by the Evaluator based on project documents

1.2.2 Project Institutional Structure

The Following organogram illustrates the structure of the project Management PM.

Figure 2: Project Organogram



Source: PM

1.3. Purpose and Objectives of the Evaluation

The purpose of the Mid-Term Evaluation is to ensure that the project remains on track towards achieving its objectives and outcomes.

- The immediate objectives of the evaluation are:
- Assess progress being made towards the achievements of the project outputs and outcomes
- Identify corrective action as needed
- Present lessons learned
- Provide recommendations for enhanced implementation during the second term of the project.
- Identify signs of success and/or failure
- Evaluate the projects' success to date
- Evaluate potentials to successfully achieve projects' overall targets by the end of its duration.

1.4. Methodology

1.4.1 Approach

The MTE applied the quantitative-qualitative mixed approach, depending on both secondary and primary sources. A consultative and participatory methodology has been applied to gather primary data, information and perceptions.

1.4.2 Methods

Secondary Data Review and analysis

The desk review served two functions: a) providing direct information for use in the evaluation report and b) providing insights about issues to be raised and/or confirmed during primary data collection.

The desk review included:

- Project document
- Annexes
- MOUs
- SOPs signed for the project
- Periodical project reports
- Activity reports
- knowledge products such as flyers and brochures
- Project related national strategies

- Project related technical papers and studies

Individual Interviews

In-depth individual interviews were conducted with representatives of the following target groups:

Key officials in Cairo (WFP management and officials of the Ministry of Agriculture) In-depth Key officials in the project governorates (concerned officials in the different directorates at the governorate and local levels including officials from the directorates of Agriculture, Irrigation, and Social Solidarity)

- Board Members of project partner-NGOs
- Project staff
- Project experts

The total of interviewed individuals amounts to **41** Persons from all project governorates**

Focus Group Discussions

FGDs were conducted with representatives of the following target groups:

- Project staff
- Board Members of project partner-NGOs
- Beneficiaries of agricultural activities
- Beneficiaries of improved irrigation canals (Mesqas)
- Male beneficiaries of goats' lending activity
- Female beneficiaries of goats' lending activities
- Absolvents of IDCL training course

The total of individuals participated in FGDs amounts to **163** Persons from all project governorates** and 12 project villages.

Site Visits and Observations

The Evaluator visited several project sides to observe implemented activities.

1.4.3 Levels and criteria of analysis

The MTE applied the **evaluation criteria** defined in the UNEG and OECD/DAC standards, excluding "impact", which cannot be measured during the project period.

Evaluation Criteria:

Relevance: the MTE looked at the **relevance of the design** of the project and examined whether the project objectives are consistent within the national strategies and priorities as well as with beneficiaries needs and priorities.

Effectiveness: The MTE looked at the extent to which the project achieved its planned results.

Efficiency: The MTE looked at the way in which resources and inputs (funds, time, and human resources) were applied towards the achievement of the project results. It ultimately aimed to determine whether the implementation mechanisms chosen were the most appropriate for the nature of the project's objectives and expected results.

Sustainability: The MTE looked at the continuation of resulted benefits from the project activities as well as at the probability of long-term benefits.

1.4.4 Evaluation main questions:

Relevance

- To what extent are the project objectives/ outputs consistent with development strategies and priorities?
- Evaluation Question: Did the project respond to a real problem/need of southern Egypt and the targeted communities?
- Evaluation Question: Do the project activities, objectives and outputs address the needs and priorities of the targeted communities regarding climate-impacts on food productivity and livelihoods?
- Evaluation Question: Are these objectives /outputs still valid?

Effectiveness

- To what extent has the project achieved the targeted results/outputs of the considered period?

Efficiency

- To what extent were project activities cost-efficient?
- To what extent were project activities time-efficient?

Sustainability

- Are the project activities and results likely to continue after its termination?
- Has the project sufficiently built local capacities, ownership, and responsibility?
- Do the applied interventions have potential for replication?

2. Findings

2.1 Relevance

2.1.1 Relevance to development and climate change adaptation strategies

Evaluation Question: To what extent are the project objectives/ outputs consistent with development strategies and priorities?

A-Alignment with the Agricultural Sustainable Development Strategy 2030

Comparing the overall objectives and the targeted outputs of the project to the vision statement and main objectives of the National Agricultural Sustainable Development Strategy 2030 reveals the close alignment of the project and the strategy:

The **vision statement** of the national strategy is:

“To achieve comprehensive economic and social development based on a dynamic agricultural sector capable of sustained and rapid growth, while paying special attention to helping the underprivileged social groups and reducing rural poverty”³

The **main objectives** of the strategy are:

1. Promoting sustainable use of natural agricultural resources
2. Increasing the productivity of both land and water units
3. Raising the degree of food security of the strategic food commodities
4. Improving the livelihood of rural inhabitants
5. Reducing poverty rates in rural areas
6. Increasing the competitiveness of agricultural products in local and international markets
7. Improving the climate for agricultural investment

The **project overall objectives** are:

1. To enhance climate resilience and improve food security in Southern Egypt, to serve the 45 percent of Egypt’s rural population living in this region
2. To build capacity at national, regional and local levels to understand climate trends and impacts and replicate adaptation interventions

The **project-targeted outputs** are:

Output 1.1: Community level mobilization and climate adaptation planning

Output 1.2: Establishment of a climate change and adaptation online application

Output 1.3: Introduction and use of water saving irrigation and other adaptation techniques

Output 1.4: Building resilience in agricultural production

³ MALR, Agricultural Sustainable Development Strategy 2030, 2013

Output 1.5: Building resilience through livestock and poultry production

Output 2.1: Training of government technical staff

Output 2.2: Universities integrate climate adaptation solutions into their academic curriculum

Output 2.3: Sharing project results and lessons learned and mainstreaming new approaches in local and national planning

Output 2.4: Documentation of lessons learned and best practices

The table below shows the strong consistence of the project and the national agricultural strategy. Particularly the first five project outputs correspond to the first five strategy objectives. The consistence of the other project outputs with the strategy objectives is also evident, however rather in an indirect manner.

Table 1: Project Alignment with the National Agricultural Strategy

Project Outputs	Output 1.1	Output 1.2	Output 1.3	Output 1.4	Output 1.5	Output 2.1	Output 2.2	Output 2.3	Output 2.4
Agricultural Strategy Objectives									
1. Promoting sustainable use of natural agricultural resources	Direct coherence	Indirect coherence	Indirect coherence	Direct coherence	Indirect coherence	Indirect coherence	Indirect coherence	Direct coherence	Indirect coherence
2. Increasing the productivity of both land and water units	Direct coherence	Direct coherence	Indirect coherence	Direct coherence	Indirect coherence	Indirect coherence	Indirect coherence	Direct coherence	Indirect coherence
3. Raising the degree of food security of the strategic food commodities	Direct coherence	Direct coherence	Indirect coherence	Direct coherence	Direct coherence	Indirect coherence	Indirect coherence	Direct coherence	Indirect coherence
4. Improving the livelihood of rural inhabitants	Direct coherence	Direct coherence	Indirect coherence	Direct coherence	Direct coherence	Indirect coherence	Indirect coherence	Direct coherence	Indirect coherence
5. Reducing poverty rates in rural areas	Direct coherence	Direct coherence	Indirect coherence	Direct coherence	Direct coherence	Indirect coherence	Indirect coherence	Direct coherence	Indirect coherence
6. Increasing the competitiveness of agricultural products in local and international markets	Indirect coherence	Indirect coherence	Direct coherence	Direct coherence	Indirect coherence	Indirect coherence	Indirect coherence	Indirect coherence	Indirect coherence
7. Improving the climate for agricultural investment	Indirect coherence	Indirect coherence	Direct coherence	Direct coherence	Indirect coherence	Direct coherence	Indirect coherence	Indirect coherence	Indirect coherence

Direct coherence

Indirect coherence

B-Alignment with the National Strategy for Adaptation to Climate Change and Disaster Risk Reduction

The National Strategy aims at achieving the following goals:

1. Increasing the flexibility of the Egyptian community in dealing with the risks and disasters caused by climate change and its impact on different sectors
2. Enhancing the capacity to absorb and contain climate-related risks and disasters

3. Reduction of climate change – related disasters⁴

The project components and overall objectives are more than relevant to the national Strategy for Adaptation to Climate Change; they are almost basing themselves on the first two goals of the strategy.

2.1.2 Relevance to needs and priorities of target groups

Evaluation Question: Did the project respond to a real problem/need of southern Egypt and the targeted communities?

Those who are skeptical about climate change should remember the Coptic calendar⁵, which has been the main determining timeframe for planting and growth phases from ancient Egypt until shortly, irrespective of weather fluctuations. Today, farmers can no longer depend on these seasons since they do not apply to the current situation anymore. Even popular traditional proverbs that describe what happens to the crop in each phase are no longer relevant.
(Farmer)

There is almost total agreement among participants of individual interviews, FGDs and open meetings that climate change is an evident fact that cannot be doubted or reduced to regular climate fluctuations (with the exception of one key person who believes that climate change is a fictional phenomenon propagated for personal interest).

One factor contributing to the overall consensus on climate change phenomena was the fact that the governorates of Upper Egypt were undergoing an exceptional heat wave with record humidity levels at the time of the fieldwork. This further underscored the actuality and urgency of climate change and heightened the credibility of the project, especially since its commencement preceded these acute weather conditions.

Evaluation Question: Are the project activities, objectives and outputs addressing the needs and priorities of the targeted communities regarding climate-impacts on food productivity and livelihoods?

Regarding the project's underlying notion, its concept and its components, all interviewed key persons agreed that the project responded to a real problem with utmost priority. Statements were similar among FGDs, where participants agreed on the importance of the issue that the project is addressing and its absolute priority to cope with the impact of climate change on their production. In a few singular cases respondents disagreed on details pertaining to the kind

⁴ Information and Decision Support Center of the Egyptian Cabinet and UNDP-Egypt, Egypt's National Strategy for Adaptation to Climate Change and Disaster Risk Reduction, 2011

⁵ Coptic year is the extension of the ancient Egyptian civil year, retaining its subdivision into the three seasons, four months each. The calendar is still in use all over Egypt by farmers to keep track of the various agricultural seasons.

of crop that the project targeted, since in a few areas other crops were deemed more important, such as sugar cane, vegetables and fruits.

Around 10% of FGDs' participants would have preferred for the project to respond to more local conditions that are tailored to the specific needs of the respective village and, on occasions, to those of particular individuals. Further discussion with the persons in questions indicated that they are not arguing from the perspective of general relevance but are rather describing ways to maximize their own direct benefits (for instance, obtaining cows rather than goats) as opposed to considering the underlying issue of climate change adaptation.

With respect to income improvement, poverty alleviation and achieving higher food security, approximately 80% of the key persons found the project relevant to these areas in the entire region. The other 20% found that direct beneficiaries of the project would experience a significant impact in those areas, whereas overall impact will depend on the project's success in disseminating and adopting the underlying practices as well as on the response of the relevant authorities.

Participants of FGDs at the community level (partners NGOs and end beneficiaries) expressed unconditional confidence in the project's relevance and its impact on increasing income and food security. However, their opinion about the distinct project components varied, since agricultural components, land consolidation, irrigation development and climate warning system were rated more positively than the goat component.

Evaluation Question: Are these objectives /outputs still valid?

The hypothetical question "If the project was first proposed now, would you approve of its implementation?" was predominantly answered positively (over 95%), which clearly reflects a belief in the project's importance for the present and near future.

2.2 Effectiveness

Evaluation Question: To what extent has the project achieved the targeted results/outputs of the considered period?

COMPONENT 1.

ADAPTATION OF CLIMATE CHANGE THROUGH TECHNOLOGY DEVELOPMENT AND TRANSFER

2.2.4. Community mobilization and stakeholder participation

A- Baseline

Prior to the project, there were in fact several NGOs that mostly incorporated the term "Community Development" in their title in one way or another, however a large portion thereof disposed of next to no means and engaged in few notable and mostly charity activities.

With respect to the farmers, there was virtually no entity supporting them in understanding and facing their difficulties in any real manner, even though there have been governmental efforts to support poor or disadvantaged groups. No self-organized efforts to cope with relevant issues or improve production and living conditions were noted, nor was there any form of involving communities as participants in decision-making or implementation.

As for the concept of climate change, it was almost entirely unfamiliar not only to the local communities, but also to a large portion of officials.

B- Target

130,000 people throughout the project's duration participated in awareness sessions and mobilized to participate in project activities

C- Procedures and Achievements

Community mobilization and strict implementation of a participatory approach represent a distinct strength of the project. In all phases of the project cycle, particularly in the planning phase, project partners and stakeholders were earnestly involved. This was emphasized by the vast majority of respondents in individual and group interviews.

As for the quantitative target of this output, the different forms of community mobilization reached approximately 50,000 individuals, which is considered a remarkable achievement, especially in light of the project's delayed actual start.

In responses to the question "how do you evaluate the level of stakeholder participation in designing and implementing the project?" over 90 percent of respondents answered with very satisfactory.

It is worth mentioning that during discussions it became evident that a portion of those not satisfied with the level of participation are referring to the fact that the project's main idea, namely the adaptation to climate change, irrespective of its importance, was decided in advance.

During the project identification phase, an in-depth and wide-scope baseline study was conducted, including a detailed situation analysis for each of the project villages encompassing all project relevant factors. The fieldwork of this study contributed in itself to informing the communities about the project and creating a positive attitude toward the project. This in turn contributed to paving the way for community mobilization after the project started.

In the project planning and designing phase, a wide range of participatory tools were repeatedly applied, e.g. an inception workshop, focus group discussions with different groups of beneficiaries, partners and other stakeholders as well as numerous in-depth and key-persons interviews.

The implementation of the project activities is also widely based on a participatory approach at all levels:

At the **central level** in Cairo, the project established a **Central Steering Committee** consisting of representatives of all relevant ministries and authorities (mainly bodies affiliated to the Ministry of Agriculture). Similar Coordination Committees was established at **governorate and district levels**.

Figure (2): Stakeholders Involvement in the Project



However, the most active and effective level of participation is the community level, where the implementation of project activities widely depends on the local partner NGOs as well as the beneficiaries themselves.

In this respect, the involvement of the local communities evolved throughout the process, starting with community mobilization and reaching active community participation, and finally community organization.

In the initial interactions with local inhabitants (planning and designing phase), the project targeted achieving community mobilization in order to become acquainted with the region and study conditions and problems on one hand as well as familiarize the community with climate change and the project on the other hand. Subsequently, ways in which the project can face the phenomenon and respond to inhabitants' needs were to be discussed. Prior to commencing implementation activities, the project had selected an NGO in each village from a shortlist recommended by the respective ministry (Ministry of Social Solidarity), based on the availability of a minimum of institutional capacity. Subsequently, the project evaluated the NGOs institutionally and offered support in terms of technical and human resource capacities.

In selecting partner NGOs, a qualitative difference in the role of local communities was induced, since implementing the activities now constituted a direct responsibility of the partner, carried

out under the supervision of project employees and experts. Thus, the interaction with local communities developed into community participation.

Figure 3: Consultative Meeting in the Project-Planning Phase



As the activities and implementation workload increased, the project, in cooperation with the NGOs, formed local committees within the NGOs that were assigned with carrying out the project activities. Within those committees, facilitators were identified and assigned with day-to-day procedures and financial management. In addition, climate-monitoring centers were established within the NGOs and supplied with computers, internet and related equipment. Two volunteers from within the communities were trained on managing the centers. While initially their involvement was identical and on an entirely voluntary basis, in time, one became in charge of accounting issues and the other handled everyday work, in return for a minor compensation. In this manner, the project's involvement in the local communities, which was already characterized by a high degree of community participation, gave way to community organization, which constitutes a form of self-help and allows for greater sustainability.

Success story:

Through the project, NGOs came to understand their role differently. Rather than being restricted to charity and social work, after their cooperation with the project they realized their capacity to engage in real and effective development work. Furthermore, NGOs grew attentive to the importance of income diversification among farmers as one way of coping with climate change. As a result, one NGO expanded its production role independently of the project and established a production cooperative for the manufacturing of pomegranate molasses in an area where pomegranate is a common crop.

D-Improvement Areas

- Although the project conducted an institutional evaluation of the NGOs and worked towards NGO capacity building through improving equipment and delivering training on strategic planning to some of the members, more capacity building will be needed for the increasing significance of NGOs in the implementation of project activities and their sustainability after project termination. This is particularly true with respect to human capacity building (comprehensive training program) for the boards of directors, project committees and facilitators.
- Dependence on community members and volunteers is, in principle, positive and required for assuring sustainability. However, and in spite of the significant support provided by project officers and experts, the current and expected workload exceeds that which can effectively be covered by volunteers. This particularly applies to the facilitators.
- The project has been gradually balancing this through limited compensations for the facilitators; however, the lack of clear task descriptions, work regulations and adequate incentives threaten the sustainability of activities.
- Relying on voluntary work in the climate monitoring centers also threatens their sustainability, in case volunteers cease to engage in this role for whatever reason.

2.2.2 Establishment of a Climate Change and Adaptation Online Application (CCAOA)

A-Baseline

In the framework of the *Agricultural Climate Adaptation Strategy (ACAS)*, the *Agricultural Research Centre (ARC)* of the MALR founded the *Central Laboratory for Agro-metrology (CLAM)*. The laboratory established *Climate Monitoring Stations (CMS)* at the regional level. Other stations belong to the *Egyptian Meteorological Authority (EMA)*. Those systems are neither linked to each other nor to any institutions that deliver climate information to farmers.

B-Targets

1. Training over 100 direct participants in Cairo and participating governorates to use the system
2. Reaching over 130,000 direct beneficiaries from the system and over one million indirect beneficiaries from the potential scale-up of system use.

C-Achievements

In collaboration with experts from the Institute of Field Crops (IFC) affiliated to the Agriculture Research Center (ARC), the project developed the first version of the software for the **“Climate Change and Adaptation Online Application”**, including a monitoring and early warning system. Further versions will be developed in collaboration with CLAC and EMA.

The first quantitative target was achieved, however due to the repeated change of ministers and heads of sectors at the Ministry of Agriculture in Cairo, the training was restricted to the

governorate level. In this regard, the project upgraded the capacity of Climate Monitoring, Stations to be able to effectively monitor, forecast, analyze, and report/disseminate climate data and information. This included providing computers and other related equipment as well as staff training. Originally, the target group of this training was the Agricultural Extension Agents, however, due to the fact that the majority of those agents are 50-59 years old, the heads of the Agriculture Directorates, in agreement with the project management, decided to select people from different agricultural departments.

The training focused on computer skills at the level of the International Computer Driving License (ICDL) and included 20 Agricultural Engineers from each governorate, selecting the best two absolvents to run the stations and be the focal point of the system. 73 % of training participants passed the training course and obtained the certificate. However, when excluding one governorate, which represents an exceptional case, since only 2 participants passed the training course (Suhag), the percentage reaches 91%, which is approximately the average of the other four governorates.

During the FGDs, the training participants expressed high satisfaction with the acquired training. They consider the skills they gained a great asset at personal and professional level. They believe that enriching different departments with computer skilled staff is much more useful not only for climate change issues, but also to improve overall work procedures. Moreover, they assured with high enthusiasm that the training will be the basis for the sustainability of the CMS. At community level, each of the partner NGOs also received a computer with related equipment, and in each village, two university-graduated volunteers who are familiar with computers were trained on using the system. As mentioned above, a separate office in each organization (in some cases in another available space) was designated as a “Center of Climate Change”.

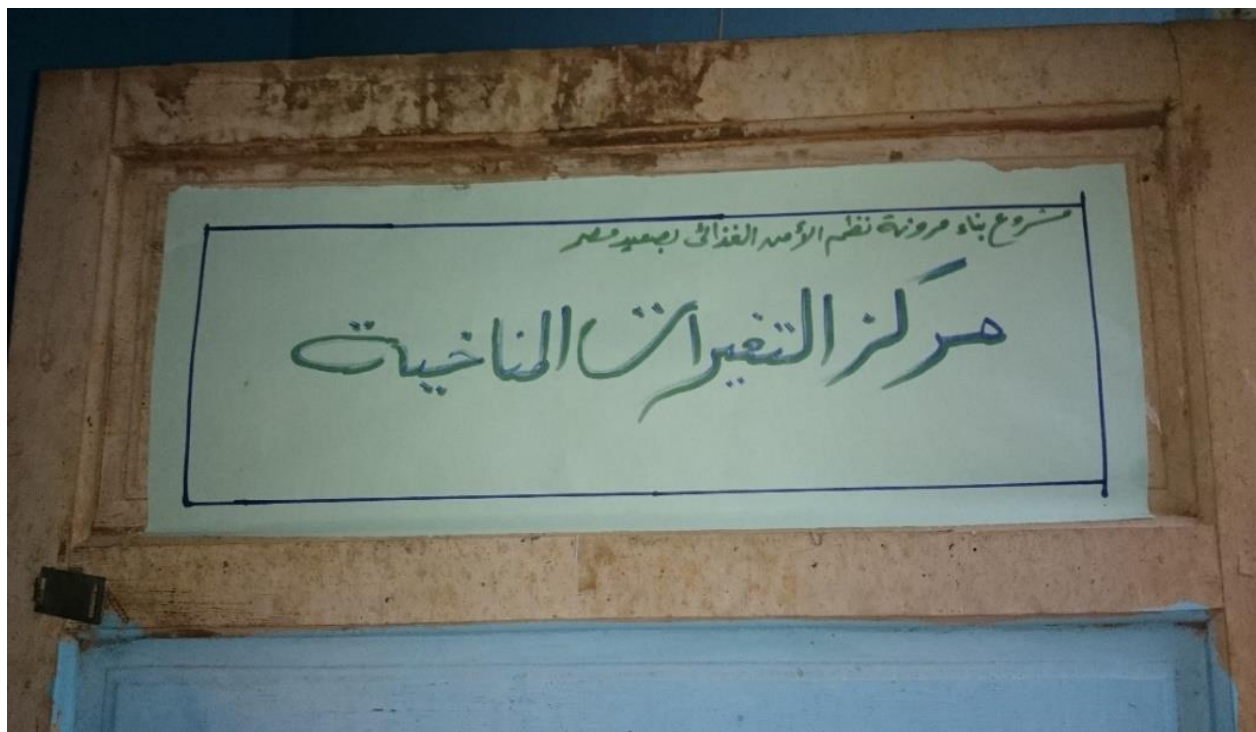
Success Story

The Head of the Agricultural Directorate in one of the project governorates (Qena), formed a permanent workforce for information and databases of the 20 trainees (including the two that did not succeed in obtaining a certificate). This team managed to design and enter a detailed database for the farmers’ health insurance system recently established by the government and is currently working on establishing a database for the 160 000 landholders in the governorate. In order to ensure sustainability, the team is now aspiring to establish a permanent unit that incorporates their activities in addition to their original field of work.

“Out of sheer enthusiasm, those of the team who own a computer, work voluntarily at home and bring the data they entered on a C.D.”

(The Director of Agricultural Directorate)

Figure 4: Sign on a Door “climate monitoring center”



I would not have imagined that a minor piece of information can save a crop. When the project expert told us that there was going to be rain in two days and that we should not irrigate the wheat fields according to schedule, we had great doubts, because we were sure of our irrigation schedule. Therefore, some of us refused to follow his advice while other followed it. Indeed, it rained unexpectedly, and those who had irrigated their fields incurred great losses, while those who had not were able to save their crops. We realized the value of information to our lives and produce.
(A Wheat Farmer)

Regarding the software, the project targeted developing a program linking climate stations that already generate five-day forecasts to a central hub, and relating this to agricultural practices in the form of advice/tips to farmers on how to address upcoming weather (climate adaptation solutions). The software is already developed and tested for one climate factor (temperature) and one crop (wheat). A website in Arabic language for this purpose has been developed and is ready for use. The content of the website has been jointly developed and will be managed and maintained by concerned entities, including those of ARC, Climate Change Information Center and Soil, Water and Environment Research Institute (SWERI), and relevant research institutes) in addition to the Egyptian Meteorological Authority. In collaboration with different stakeholders, some dissemination activities have already started since the issuance of the software in March 2015. These included local wired loudspeakers networks, Facebook posts, dissemination through extension workers, etc. Other dissemination activities are also included in this year's project work plan.



As for the second target (reaching over 130,000 direct beneficiaries from the system and over one million indirect beneficiaries from the potential scale-up of system use), based on the project management estimation, 5,000 and 20,000 people have direct and indirect access to the software, respectively. It is relatively difficult to assess this estimation; however, the abovementioned activities represent a strong basis to achieve the output target.

Figure 5: Negotiation on Land Consolidation



D-Improvement Areas

- The training on using computers could have been more comprehensive by including agro metrological data could be used to improve agricultural productivity. This would have increased awareness of the issue's importance and understanding the full context for which they are trained.
- The training for using computers professionally did not include specialized courses addressing climate change-related issues.
- The timing of the training was widely dependent on the schedule of the training centers, which did not comply with the work requirements and schedule of a part of the training candidates. Some of them merited training participation by virtue of their positions and capabilities, but were not recommended because they were needed in their respective work fields at the training time.
- Although extension workers participated in some project training activities, they are not sufficiently informed about and trained on the CCAOA, which is important for supporting the dissemination and sustainability of the system.
- While some dissemination activities have already been started, a strategic framework is needed for the dissemination and outreach aspects of the climate monitoring results, which is necessary for achieving the wider target (i.e. the second target for this output).

2.2.3 Introduction and use of water-saving irrigation and other adaptation techniques

A-Targets

1. Over 4000 acres directly benefiting from optimal irrigation efficiency low-cost solutions
2. All canals undergoing improved irrigation efficiency will also benefit from water user associations established and strengthened under the project

B-Baseline

Although water use efficiency was a common high priority for all stakeholders interviewed during the project inception phase as well as during the mid-term evaluation, the baseline study showed that no notable water saving technologies were applied in the project area. In addition, there was no self-organization among farmers using the same Mesqas (tertiary canals), which is the end unit in the regular irrigation system in Egypt (figure 6). The Ministry of Irrigation is responsible for the irrigation system, starting with the Nile River and ending with branch canals. However, it has no authority or responsibility in terms of the Mesqas, which run across farmers' own lands.

What is a Mesqa?

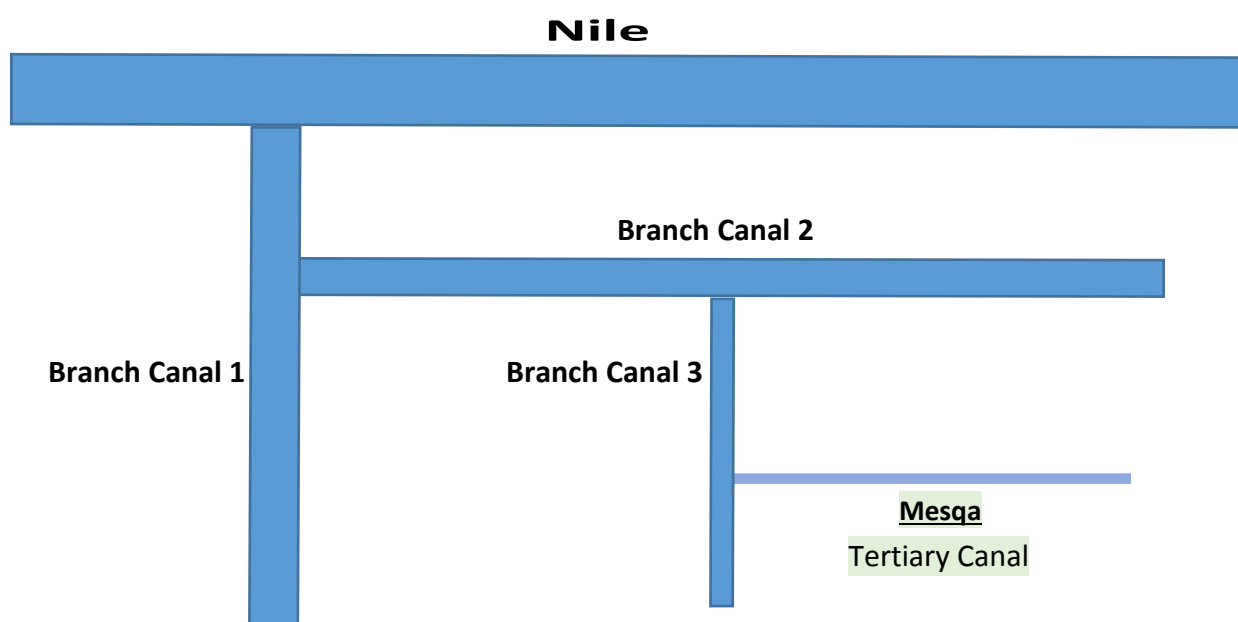
A system of irrigation canals, also known as a "canal network", transports water from its source to the fields, and is made up of many canals. Water is distributed from the main or primary canal (the Nile) by smaller secondary canals (the branches) to the tertiary canals (the Mesqas), which are the smallest canals. From these Mesqas the water finally enters the fields, where it is used to irrigate the crop. The Mesqas are positioned in the field.

Figure 6

Mesqas are often clogged by wastes and ecologically harmful to their environment. These problems are particularly acute at the end of Mesqas, where waste accumulates and little water arrives, which in turn jeopardizes the crop.

Due the complete lack of farmer organizations to address these issues, the condition of Mesqas has deteriorated severely, especially in light of general water scarcity. Additionally, the uneven ground level of agricultural land in most areas constitutes yet another irrigation problem. Since the prevalent irrigation method is flood irrigation, this ground level irregularity wastes large quantities of water and is harmful to both crop and soil. Moreover, land fragmentation contributes to further wastes of irrigation water.

Figure 6: Irrigation Network in Egypt



C- Achievements

In facing the irrigation system problems, the project applied a package of optimal irrigation efficiency, low-cost solutions, including:

- Establishment of Water Users' Associations (WUA)
- Improvement of Mesqas (open or piped)
- Canal clearing of weeds
- Laser leveling of soil
- Crop consolidation at Mesqa level
- Scheduling of irrigation by water users
- Strip irrigation

The establishment of the WUAs was the point of departure and the basis for all other water-saving activities. Since the law regulating those associations is not yet endorsed, the project, in consultation with the beneficiaries, decided upon a creative solution to overcome this legal obstacle, namely establishing the associations within the framework of the partner NGOs, as a specific committee and part of its structure. This required NGO membership on the part water users, which constituted a further step on the way to community organization. **Four WUAs have already been established and one is currently under establishment.**

The WUA played a central role in carrying out the other water-saving measures, and are growing in importance as they acquire experience. Regarding the improvement of Mesqas, the WUAs in cooperation with the project and in consultation with irrigation experts, examined the Mesqas and identified the most derelict and simultaneously most used by farmers. Irrigation experts then designed an optimally improved model (open Mesqas or Mesqas with pipes depending on the particular area). In some cases, the WUAs contributed to mobilizing and organizing farmers to clear the wastes from the targeted Mesqas, and supervised the commissioned establishment of Mesqas. Ultimately, the WUAs commissioned the work themselves which led to improved quality and reduced expenses while simultaneously adding to the capacity and experience of the NGOs.

The project completed the work on 4 Mesqas reaching a total of 2750 meters and irrigating a total of 235 feddans across 257 beneficiaries. Moreover, beneficiaries were trained on the use and maintenance of the improved Mesqas.

Figure 7: Strip irrigation



Beneficiaries and other stakeholders expressed very high satisfaction with the Mesqa improvements and confirmed the direct and clear impact on water saving, irrigated land areas and increased productivity. Furthermore, these areas no longer experience water disputes due to the increased availability on one hand and the satisfactory regulations established through the WUAs on the other hand.

Figure 8: Improved Mesqa



One indicator pointing to the success of the Mesqa improvement efforts is the fact that farmers expressed the wish to expand this activity, either in return for contributions to the actual work or to the financial expenses or both. This was the case both among farmers in the areas where Mesqas have been targeted as well as areas where no Mesqa improvements were carried out. Furthermore, irrigation officials in the governorates where Mesqa improvements were undertaken stated that the improved models met technical criteria and effectiveness standards. The last three water-saving activities by contrast did not rely on Mesqa improvements were subject to other selection criteria. Accordingly, they were not carried out in cooperation with the WUAs but rather with the project committees within the partner NGOs.

Land consolidation at Mesqa level as well as laser leveling of soil were interdependent activities, since in the first year of the project, laser leveling constituted an additional incentive in overcoming the skepticism and hesitation in the face of land consolidation for the purpose of planting a unified crop. The project in cooperation with the WUAs engaged in extensive

persuasion efforts and contributed to settling disputes and problems that occurred in light of these two activities (for instance, the necessity to remove palm trees and other trees from some areas). In total, 1055 feddan distributed among 4220 beneficiaries underwent land consolidation and laser leveling, while raised bed planting was implemented across 529 feddan⁶. **Thus, the total area where one or more optimal irrigation efficiency, low-cost solution was put in place amounts to 1,819 feddan.**

(The last three activities and those common to both water saving and the agricultural component will be addressed in further detail under agricultural activities)

Success Story

In areas across Suhag where the covered Mesqa system was applied, a considerable section of the old Mesqa ran through inhabited areas, causing health and ecological problems, including stagnant water and waste accumulation. Through improving the Mesqa, it was possible to cover an area 200 meters long and ten meters wide.

Local authorities sent a letter of appreciation to the project and announced the creation of a garden on the available area that will bear the project's title.

D-Improvement Areas

Unlike other project activities that require persuasion and awareness efforts, the Mesqa improvement activity is considered lucrative and needed. Farmers in fact compete for the implementation of this activity in their areas, since its positive impact is both direct and guaranteed. Accordingly, it would have been possible to involve beneficiaries to a greater extent, in the form of in-kind contributions, financial contributions, or contributions to the work process. This would have allowed for more a wider scope of improvements and a greater impact at the outcome level. Furthermore, some beneficiaries and NGOs mentioned work on some Mesqas starting considerably later than their anticipations.

2.2.4 Building resilience in agricultural production

A-Baseline

⁶ The last three activities and those common to both water saving and the agricultural component will be addressed in further detail in section ** of the report.

According to the results of the baseline study for the project, the most important factors that prevent farmers from applying any climate change adaptation practices are lack of knowledge and uncertainty about the impact of such practices.

It is worth noting that in the surveys handed out in the villages, these two factors interchanged in the level of importance, whereas the cost factor always followed the two factors in third place in all villages.

Although the extension service is mentioned in the villages' survey results as the first source of information (regardless of how weak and ineffective), the extension agents, as well as all other sources of information, have not tackled adaptation to climate change in any way.

Moreover, all relevant authorities and research institutions could have information and studies on the phenomenon of climate change and its impacts on agriculture; however none of them have any studies, or even guidelines, on how to adapt agriculture to this phenomenon.

Accordingly, almost none of the farmers had applied any technological adaptation solutions before the project started, and very few of them (about 5%) have been engaged in income diversification strategies, such as intercropping, high value crops, and/or organic farming.

B- Targets

1. Over 37,000 people to benefit directly and over 100,000 to benefit indirectly from access to heat-resistant strategic plants, and to learn how to change sowing dates, and other soft techniques to reduce climate risks.
2. The above figure includes about 10,000 beneficiaries engaged in income diversification⁷ schemes

C- Procedures and Achievements

In order to achieve these two targets, the project focused on **four crops** selected for different reasons:

- Wheat, which is one of the main crops of the region, as well as for food security. However, the current variety is not heat tolerant and the agricultural practices used for wheat makes it less productive and less tolerant to pests and diseases.
- Sorghum, as an alternative to maize, since it is more heat tolerant, requires less water, claims the land for shorter periods (about three months), is more salt resistant (even absorbs salt from the soil) and more diseases resistant.
- Cowpeas, as an intercropping crop with sorghum, since it contributes to income diversification, improves and enriches the soil, reduces the impact of heat shocks on sorghum, and reduces the risk of pests and diseases.
- Sugar cane, which is also a main crop in most of the project area. However, the current variety is highly water absorbent and has become very vulnerable to pests and diseases.

⁷ income diversification is not restricted to intercropping but also includes other activities addressed under point *** (Building resilience through livestock and poultry production)

The last heat wave proved the benefits of intercropping cow bean. We knew that the cow bean increases soil fertility, however we discovered that it also helps in facing sudden extreme rises in temperature and mitigating their damages to sorghum. Planting cow bean fodder between the lines helped air the corn plants and cool the temperature. Therefore, corn fields without intercropping were severely damaged, while other fields where there was cow bean did not incur great damage.

(Sorghum Farmer)

The project linked the introduction/dissemination of the four crops with a package of improved agricultural practices, which were partially or completely applied. It is notable that almost all these practices are also water saving solutions. The most important of these are:

- New heat-tolerant varieties
- Crop consolidation (allows laser leveling, saves up to 10% of land, increases productivity, decreases efforts and cost)
- Raised bed planting (saves 25% of water and fertilizers and 40%-50% of seeds, eases harvesting, reduces harvesting losses)
- Laser leveling of soil (saves water, improves productivity)
- Intercropping
- Changing planting date

At the start the project and contrary to the activities of outputs 1.1, 1.2 and 1.3, the agricultural activities under output 1.4 were met with major hesitance and fear on the part of the farmers, due to:

- General hesitance among small farmers to adopt risk-avoidant innovation
- Historical lack of trust in any official or semi-official parties
- The effect of other recent projects that did not succeed or were associated with risks of losing land due to debt
- The problems and fears specifically associated with land consolidation

For these reasons, in the **first season**, the project relied on **wheat and sorghum** to attract farmers to participate in the extension/demonstration fields (which should have special characteristics, the most important of which are:

- Having a space of no less than one feddan
- To be owned by a successful farmer
- To be on a road
- To have good soil quality
- To be provided with sufficient and regular amount of water

Intensive awareness activities on the new agricultural practices were organized to introduce the new interventions and encourage farmer's participation. For further encouragement, and as per its design, the project offered a package of **in-kind incentives** in the form of agriculture inputs. The number of farmers who participated with their fields for this purpose varied from one village to another, and the total number of extension fields for the first wheat season amounted to **38 fields**. The project experts, officers and local facilitators oversaw the accurate implementation of the agricultural instructions.

The wheat fields achieved great success in all extension fields, whereby the wheat harvest increased compared to previous years and surrounding lands at rates between **20%-50%**, with an average of 27 ardebs and a maximum of 32 ardebs (a record number). The average yearly wheat produce in the project's governorates amounts to 18 ardebs.

The project organized a wide-scale folkloric event- harvest days- to present the wheat harvest and weigh the samples in front of guests to prove the increase in productivity. Moreover the project organized farmers' and students' visits to the extension fields by non-beneficiaries from the project's villages as well as neighboring ones.

News of this impressive success spread throughout the region, and its impact was much larger and more effective than all convincing efforts. This helped draw the farmers to participate with their lands as extension fields in the next summer crop, which was sorghum, despite introducing sorghum as an alternative to maize being a much more innovative step than changing the variety of wheat or the process of planting. Moreover, sorghum was linked to cowpeas for intercropping, which was a completely new crop in the region. In spite of the fact that changing from maize to sorghum and cowpeas comprises a kind of changing well established paradigm, the extension fields in the first season amounted to 180 sorghum fields, of which 100 were intercropped, while 80 were not (Table 2)

As for the intercropping of cowpea with sorghum, responses differed. Some small farmers who do not own many cattle preferred to utilize all the land for sorghum. Also farmers, who rent the land for only one season or one year (as usual), do not consider the positive impact of cowpea on the soil and therefore do not tend to adopt intercropping with cowpea.

In the last season before the project began, one feddan of fine corn required 1000 pounds in expenses, and I sold the crop for 2100 pounds. Within the project and through planting on raised lines, changing the variety of corn and adopting different agricultural practices, one feddan cost me around 2000 pound, and I sold the crop for about 5000 pounds⁸

A farmer who achieved a record sorghum crop (without intercropping)

Furthermore, whether through intercropping or without, the sorghum fields achieved a major success, even though points of comparison were not available to the same extent as they were for wheat due to the sparseness of sorghum in the area prior to the project. This, in turn, reflected on the participation in the second wheat season, whereby the number of extension fields increased from 38 to 168 feddans, constituting a **342% increase** (Table:2).

Table 2: Development of Project Agricultural Production Area

Fields/Area Crops	Number of Extension Fields ⁹				Crop Consolidation Areas in Feddan				Sum In Feddan
	1 st Winter Season 2013- 2014	1 st Summer Season 2014	2 nd Winter Season 2014- 2015	2 nd Summer Season 2015	1 st Winter Season 2013- 2014	1 st Summer Season 2014	2 nd Winter Season 2014- 2015	2 nd Summer Season 2015	
Wheat	38	-	168	-	-	-	323	-	529
Sorghum	-	80	-	35	-	100	-	102	317
Sorghum + Intercropping	-	100	-	55	-	215	-	315	685
Sugar cane		-	-	25 ¹⁰	-	-	-	-	25
Sum.in Feddan	38	180	168	125		315	323	417	1556

Source: Calculated by the Evaluator based on project data

Moving into the second stage, based on consolidation of small plots, the idea of land consolidation was met with various challenges and conflicts, which required much time, effort, negotiation and persuasion. Among these were:

- The existence of personal conflicts between farmers in neighboring lands
- The existence of trees and palms which had to be removed as part of the borders, or in order to enable laser leveling
- The existence of even one farmer from among tens of others who refused to join the consolidation or backed out after agreeing, which negatively affected the project due to the need to find alternative spaces and starting the operation from the beginning

The role of physical borders on a farmer's need to safeguard his harvest and the social value attached to this Previous experiences in which some farmers lost their lands due to debts incurred while applying one of the projects

⁹ Regularly the area of an extension field is one feddan

¹⁰ Spring season 2015

Figure 9: Raised Bed Planting in a Wheat Extension field



Figure 10: Sorghums Extension field



Additionally, the idea of raised bed planting was also met with the need for persuasive efforts, albeit not as much as land consolidation. This came alongside the shortage of workers with the experience to implement raised bed planting, and in turn the increasing charges (the cost of labor to build one feddan of raised bed is approximately EGP 300).

The aforementioned factors led to the delay in the application of land consolidation for a whole season, whereby they were first applied with the sorghum season in the summer of 2014 on an area of 215 feddans.

In the last season prior to the project, the expenses of one feddan of wheat reached around 2000 pounds, and I sold the crop for around 4000 pounds. Within the project, raised bed planting and changing the type of crop as well as adopting new practices resulted in 3000 pounds of expenses, and I sold the crop for around 9000 pounds¹¹.

(farmer who achieved a record high wheat crop)

The turnout for sorghum in the framework of land consolidation was larger than that of the extension fields, because, despite the great success of the crop, nonetheless, fields of sorghum without intercropping are more vulnerable to losses due to bird attacks.

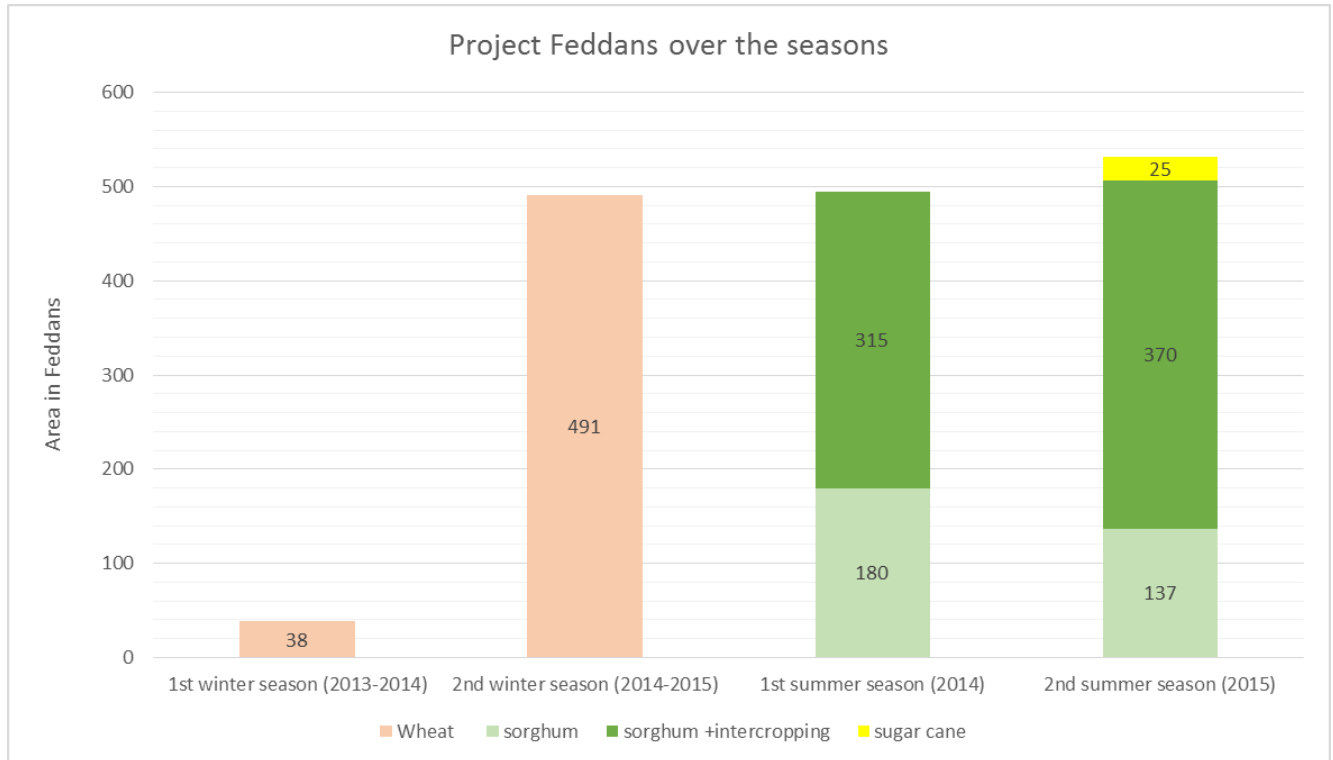
However, it achieved great success, directly contributing to encouraging wheat farmers for the 2014/2015 season, during which it enabled the farming of 323 feddans. This was followed by the 2015 sorghum season, during which the area of sorghum increased to a total of 315 feddans, or at a rate of approximately 47%. The rate of increase could have been even higher, were it not for the fact that the basic agricultural system in one of the villages of the project (Kalabsha)¹² collapsed at the beginning of applying the farming activities, thereby preventing the continuation of the agricultural component.

Taking all the abovementioned factors into consideration, it was expected that the majority of farmers would withdraw from unifying areas after laser leveling, and after benefitting from the package of in-kind incentives that the project offered in the first year. However, over 70% of the participants in the unification of shares continued in collective farming after the project stopped providing support for their lands and moved to other areas. Even the 30% (which is a very acceptable rate in light of the circumstances) that withdrew from land consolidation continued applying one or more of the other new practices.

¹¹ Unlike farmers' usual cost calculations, in both cases the expenses do not include the farmer's labor or the rent of land he owns.

¹² Kalabsha is a newly reclaimed village that relies on a giant floating pump operated by the government as the sole source of irrigation water. This pump went out of service.

Figure 11: Development of Total Project Agricultural Area



Currently, there is a waiting list of farmers who wish to participate with their lands, despite the decline in in-kind incentives, as in the second season the project only provided seeds, whereas it previously also provided machinery and fertilizers.

Furthermore, many farmers from outside the project are adopting the agricultural practices applied within the project.

It is worth mentioning that in the areas in which wheat was produced, there is a great demand for the produced wheat to use it as seed, and a reliable amount was indeed sold for this purpose, which reflects the great trust placed in the project as a whole.

I know of five villages around us, from which farmers came to inquire about the practices that led to our increased grain productivity. They began to implement those practices, however they did not organize themselves like we did or in any other manner, and they did not apply all procedures. Rather, each farmer or group of farmers only applied one or a few of the procedures.

(Farmer)

With respect to **sugar cane**, it is safe to say that farmers require little persuasion to grow this crop, since it is the first choice if water and land are available beyond what is required for the growing of seeds and fodder. This is due to the fact that sugar cane does not require intensive work, continues to grow on the land for 4 to 5 years and yields the greatest profit relative to other traditional crops.

There is a general tendency within the MALR's varieties strategy to diversify planted varieties crops, especially when a variety starts to deteriorate. For instance, the variety of sugar cane currently grown is being planted since 1954, which leads to lowered productivity and poor resistance to diseases and pests. The new variety introduced by the project does not represent a heat resistance measure, since heat generally does not jeopardize sugar cane crops, however it has the following advantages:

- Reduced water consumption
- Improved chills resistance
- Reduced risk of physiological thirst (in the event of heat shocks crops may be unable to absorb available water)
- Higher resistance to diseases and pests
- Stable productivity (across 4 to 5 years)
- Higher percentage of sugar (which may amount to a better price for the produce among sugar factories)

In general, it is difficult at this point to evaluate sugar cane production since it remains in its early stages.

D-Improvement Areas

- There is a demand-supply imbalance with respect to mechanization in the region at large. Moreover, most available machines are old and in need of maintenance. This situation has caused several problems that intervened with agricultural practices that entail mechanized steps. Most importantly,
 - Machines arrived late, which sometimes caused delays in the recommended planting dates.
 - The machines sent by mechanization stations were often old and in poor condition, which negatively impacted agricultural practices such as laser leveling and deep ploughing.

- Obtaining diesel fuel for the machines was often difficult in areas where special permits are required, especially if no one was assigned with acquiring these permits.
- Pesticides were not included in the incentive package provided by the project. However, this presented a problem and negatively affected some fields, since they were either unavailable or only available at poor quality.
- There is room for increasing the role of institutions directly related to agriculture such as agricultural directorates, agricultural extensions and agricultural cooperatives.
- A detailed cost-benefit analysis of each intervention and each crop is needed for project documentation and, equally importantly, would be a very effective tool for dissemination and outreach.
- Quantitative tracking of non-beneficiaries who adopt new project agricultural practices within, as well as outside of, project villages are not included in the project monitoring and reporting.

The big tractor broke down on the road where it remained for five days, during which the administrative and practical steps necessary for repairs were underway. We were unable to work until the tractor was fixed and when the tractor finally arrived it took several days to obtain the necessary diesel fuel, since we had to complete administrative procedures with the supply directorate. The tractor was moreover unfit for deep ploughing, so we were unable to finish the work satisfactorily, which in turn negatively affected the area's productivity compared to other villages.

Chief Executive of a Partner NGO

2.2.5 Building resilience through livestock and poultry production

A-Baseline

Similar to the situation in the field of agriculture, livestock production had been negatively affected by climate change and no efforts have been made to address the issue. Accordingly, the resilience of community livestock to climatic shocks was very critical, which represented an additional factor increasing food insecurity in the region. Community members did not have skills or information on how to reduce climate risk on livestock production, nor did they have access to proper veterinary services prepared to reduce climatic risk. Since livestock production of small animals and poultry are more or less a female business, the baseline study focused on women as a target group for this activity. The results of the baseline study showed that:

- No women were trained on reduction of climate risk on livestock

- Only about 2% of respondents to the baseline survey indicated inadequacy of veterinary services in their villages.
- No access to specialized livestock financing schemes was available in target communities

B- Targets

- Over 36,000 women will be trained on reduction techniques of climate risk to livestock
- Over 90% of women will be engaged in raising livestock
- 18,200 women will have access to specialized livestock revolving schemes during project life.

C- Procedures and Achievements

Even though the livestock production activity originally targeted women, procedurally, this was not the case during implementation. In the baseline study, female participants expressed their enthusiasm about the activity; however they were not aware of the formal procedures it entailed, such as signing papers, offering guarantees and committing to repayment. When it became clear that the goat activity, which was the initial activity for this target, required such formal steps, most families refused to involve the women in them. As a compromise, the project and the local communities agreed that the women obtain the goats while a male member of the family (the husband in the case of married couples or a close relative in the case of single women) is in charge of formalities.

The notion underlying this activity is income diversification, as an important means to cope with the hazards of climate change. After consulting with local communities and relevant authorities, the project identified the following intervention areas:

- Breeding goats
- Raising rabbits and ducks
- Beekeeping
- Alternative livestock fodder
- Improving productivity of poultry under increasing temperatures
- Institutional capacity building

The production component, i.e. the first four activities, relies on a revolving lending mechanism, whereby credit and repayment are in-kind transactions in the case of goats, and monetary transactions in the remaining areas. Due to the limited baseline capacities of the partner NGOs, the project opted to start the lending schemes with one type of animal only. Other animals will be successively introduced in accordance to the NGOs' response to the capacity building programs as well as the on-the- job training they are being exposed to.

In response to the priorities of the local communities, the project began with the goat-related credits.

1. Goats

Selecting goats as an income diversification activity was based on the following considerations:

- Goats can tolerate high temperatures

- Goats are easily fed since they eat several kinds of fodder, leftovers and agricultural byproducts.
- Goats do not require much space.
- Goats are relatively inexpensive to keep.
- Goats usually produce offspring twice a year, which is in keeping with the project's duration and the revolving lending mechanism.
- Goats do not cost as much as larger cattle, which allows for a wider base of beneficiaries and reduces loan risks.

The procedure for in-kind goat credits consisted of the following steps:

- The project conducted a feasibility study on raising goats.
- Partner NGOs recommended beneficiaries based on certain criteria, most importantly:
 - Beneficiaries should be of low income
 - Beneficiaries' income should nonetheless suffice for keeping and caring for the goats.
 - Beneficiaries should dispose of sufficient space to raise the goats.
 - Beneficiaries should be known to be trustworthy and likely to repay the credit.
- The project officers and the facilitator considered the situation of each recommended beneficiary so as to ensure they meet the requirements and identify the final list of beneficiaries.
- The number of goats that each beneficiary can take charge of was determined in consultation with the beneficiary (number of goats ranged between one and three).
- Awareness and training activities regarding raising and feeding goats were conducted with the beneficiaries.
- The goats were delivered (the target was for most of the goats to be expecting delivery, or to recently have birthed and for each village to obtain three installments of goats).
- The project is in charge of providing bucks (one per village) to inseminate the goats, delivered to the partner NGO.
- The project is in charge of insuring the goats.
- The project covers purchase, transportation and insurance expenses.
- The NGO's board of directors is obligated to the project to guarantee the repayment of the total value of the in-kind credit.
- Beneficiaries are obligated to repay 5% of the goats' value to the NGO (3% credit risks and 2% administrative fees).
- A year after delivery, beneficiaries are obligated to deliver (from the goats' offspring) the same number of goats they received to the NGO. The goats should be in the same physical condition they were received in.
- The cycle is repeated after the NGO redistributes the goats it received in repayment.

According to periodical project reports, the following achievements can be noted:

- 1000 women were trained on raising goats in the years 2014 and 2015.
- 1027 goats were distributed.
- 5 bucks were delivered to five villages.
- The total number of beneficiaries reached 510.

- All goats were insured, with the exception of kids (insurance regulations do not permit the insurance of goats younger than three months)

The activity faced several difficulties, particularly in the beginning, most importantly:

- The providers that were officially registered and that met the project's procurement prerequisites did not dispose of sufficient goats. Moreover, breeds of better productivity and higher climate tolerance than those available in the region were originally targeted. However, even after modifying the conditions for required breeds and repeatedly announcing tendering, it remained difficult to procure the goats, since offers were relatively costly and numbers remained below those needed for the region. This led to delays in implementing this activity. The project addressed this problem through contracting the *National Agency for Civil Projects Services* NACPS that were indeed able to provide the required number of goats in the installments that were delivered to date.
- The health and physical condition of a large portion of the delivered goats was below satisfactory levels, since the percentage of pregnant goats was lower than anticipated. Similarly, a number of goats were below the expected weight and, in limited cases, had eye infections (70 out of 1200).
- It was observed that pregnancy weakened female goats, increasing their susceptibility to fatigue and mortality hazards during transport. To mitigate this, the project has decided to limit the number of pregnant goats to be supplied from the vendors.
- Even though the local goat breed that was distributed is heat-resistant and accustomed to difficult climate, its productivity is rather poor; this is why the initial plan was to procure different breeds. However, since this was not possible due to market constraints, the project attempted to compensate this weakness through high quality bucks for the insemination process. Setting high standards for the required bucks constitutes one way of improving the breed, however it also rendered the procurement more difficult. Therefore, there was a delay in delivery, which prompted beneficiaries to suffice with local breeds of bucks.
- Mortality rates in the first two weeks after receipt among the goats (particularly in the first installments) were relatively high (around 8%). Most losses occurred during transportation or in the first few days upon delivery. The problems underlying this situation were studied and addressed, not only in terms of technical procedures, but also through modifying procedural regulations. Thus, the contract with the supplier was altered so as to place him in charge of veterinary care and vaccination and hold him responsible for animals deceased during transportation. Additionally, insurance conditions were adjusted such that insurance became effectual immediately after delivery, rather than 48 hours later as was previously the case. These measures caused insurance agencies and suppliers to take greater care in dealing with the animals and led to reduced mortality rates in the later installments.
- An inspection committee is established to affirm that the supplied goats met the technical specifications set by the project experts. Goats that do not meet those standards will be rejected, and the suppliers are now obliged to replace them.

- In spite of all problems related to the goat lending, the partner NGOs have been receiving numerous applications for new loans. The average number on the waiting lists amounts to about 200 applications per project village.

2. Alternative fodder

One of the limiting factors in raising animals in Egypt is the high cost of fodder, particularly for the poor families in the project area. These expenses can be expected to rise with climate-induced reductions in the yield of clover and byproducts of other crops per unit of land area.

The project introduced Silage as an innovative technique that uses agricultural waste as a main constituent, upon supplementation with low-cost additives (molasses and bran) for improvement of its nutritional value in animal fodder. The cost of preparing the mix is estimated at L.E. 250/ton. A daily intake of 2 kg will reduce an animal's need of traditional fodder by 30%, increase profitability for smallholders, reduce the demand for berseem and maize, consequently availing its cultivation land and water for other crops and contributing to relieving climate-induced pressures on resources. The technique will also utilize agricultural waste that would otherwise be disposed of by burning.

The project applied and demonstrated the production and use of Silage in all project villages. Most of the respondents were highly satisfied with the new fodder. Two respondents related bad experience since the produced fodder was of a low quality. The project expert explained that this case was due to some technical mistakes that occurred during the production.

Stakeholders and farmers consider the new fodder as a significant opportunity to improve the rentability of animal production.

For dissemination of the new fodder, the project organized several training and awareness activities and produced an illustrated brochure.

3. Improving the veterinary units

Poor veterinary services are considered one of the most salient problems facing animal production among small producers in general, not just project beneficiaries. As a complement to the goat activity, the project targeted the improvement of governmental veterinary units in project villages, this included buildings, equipment and human capacity building. Improvements were undertaken after basic needs assessments. Partner NGOs participated in all phases of this activity.

Veterinary officials in the governorates generally expressed their satisfaction with these improvements, albeit requests for further equipment and training.

The number of beneficiaries in this respect approximately amounted to 25,000 recipients of improved veterinary services.

4. Beekeeping

This activity is considered in its early stages. To date, technical and economic studies were conducted, target groups were identified and potential beneficiaries were trained. Trainees in general expressed their satisfaction with the training, yet expressed concerns about marketing possibilities.

D-Improvement Areas

In addition to the problems mentioned above which the project was largely able to address, the following areas require improvements:

1. Goats

- In light of the physical and health condition of a large percentage of the supplied goats, a repayment period of one year is relatively short. This may lead to poor repayment rates and hamper the repetition of the credit cycle.
- Goat prices are higher than the market price, especially in light of the breed and physical condition of the animals, even though these prices remain significantly lower than those obtained in the public tendering process.
- The late delivery of bucks delayed the project's cycle especially since not all beneficiaries have access to local bucks. The beneficiaries who resorted to local bucks did not achieve the breed improvement targeted by the project.
- A large percentage of beneficiaries cannot bear the expenses of feeding the goats for several months in the absence of an income that may cover these expenses.
- Veterinary services are only sporadically available and are nearly entirely limited to vaccinations. The beneficiaries seek veterinary services in the case of severe illness or to document deceased cases (the insurance requires prior consultation of veterinary services to issue compensations for deceased animals).

2. Veterinary service

- No regulated mechanism is in place on the part of the project or the NGO to ensure veterinary services are delivered to goat beneficiaries.
- Veterinarians still require further advanced training, especially on equipment delivered by the project (most importantly sonars).
- Some equipment that the project agreed to provide veterinary units with was delivered late due to customs clearance delays by the suppliers.
- Governmental veterinary administrations, albeit satisfied with improvement of units in general, believe they were not sufficiently involved in the goats procurement steps and could have further contributed to the greater success of the goat component by delivering technical input in addition to the project experts.

3. Alternative fodder

- More disseminations and training activities are needed in light of the importance of this component.
- The farm machines available in the region are limited in number, difficult to access and relatively costly, which hampers the implementation and dissemination of this intervention.
- The silage activity was not complemented with consistent veterinary monitoring to follow up on the health and growth of animals that received silage.

4. **Beekeeping**

- The project's beekeeping plan lacks a marketing component, which is especially important in the case of this product as it is entirely novel to participants who consequently have no experience in marketing it.

COMPONENT 2

Capacity building for climate knowledge and adaptation replication

2.2.6 ***Awareness and advocacy***

A- Baseline

Prior to the project, climate change was not considered an issue in any notable manner in the project area. On the national level, studies were available on climate change and its impact; however no mechanisms or programs for how to deal with this phenomenon or disseminate the information to officials and farmer were in place, such as advocacy meetings, brochures or other media production.

B- Targets

1. Software on climate risk management have been developed and launched nationally to connect climate stations of different government agencies and develop adaptation guidance for each climate scenario for use by online users nationwide.
2. 300 officials at local and central government, as well as parliament¹³, are aware of climate proofing agriculture and water management.
3. At least five different printed awareness materials were produced.
4. At least 4 different press releases were issued.
5. At least 10 TV and 10 radio spots were produced and aired.
6. At least 10 awareness and advocacy events were held for new parliamentarians and policy makers.
7. 300 students from the three key universities in Southern Egypt benefit yearly from the lessons learned from the project's interventions.

C- Achievements

- Software on climate risk management was developed

¹³ There is currently no parliament in Egypt.

- 100 staff members of different agricultural directorates were trained on using computers¹⁴.
- 806 extension workers were trained in the field of practical methods to mitigate the negative effect of extreme weather events on wheat cultivation
- 350 officials are aware of climate proofing agriculture and water management
- 80 advocacy meetings were held at local and central government. The officials reached were from different levels, starting from the extension workers at the local level and reaching the heads of concerned Agricultural Research Centers and the Minister of Agriculture.
- Four brochures and 50 press releases were issued. The positive results achieved by the project, and the tangible effect on farmers, have generated an unforeseen interest by the media to follow and report on the different project activities.
- 50 articles were written about the project.
- The project is now widely known in its governorates and among the agricultural circles. It is also increasingly recognized as good practice.
- 5 Facebook groups, one for each governorate, were established, with an average number of 500 participants per group. In addition, a YouTube channel with 1000 views to date is online.
- 22 TV spots were produced and aired.
- 10 radio spots were produced and aired.

D-Improvement areas¹⁵

- Even though many notable awareness and advocacy activities were successfully implemented, they were not part of a comprehensive dissemination and outreach strategy.
- The training activities did not focus sufficiently on the training of trainers (ToT).
- No comprehensive training material was produced so as to ensure the sustainability of the training.
- The printed material (posters, brochures and booklets) was limited in comparison with the importance and diversity of topics.

¹⁴ The training is discussed in detail in section **

¹⁵ ¹⁵ Other potential areas of improvement were mentioned in section (*)

2.3 Efficiency

**Evaluation Question: To what extent were project activities cost-efficient?
(Financial Efficiency)**

Mid-term evaluations in general do not allow for the accurate assessment of cost-benefit relations since the project remains in flux. However, the evaluation identified quantitative and qualitative indicators based in part on project documents and reports, but mostly on the judgment of the experts, the partners and the evaluator herself. These indicators clearly point to the overall high cost efficiency of the project up until the midterm evaluation. Moreover, a few negative indicators were identified as well, and should be addressed to achieve higher cost-efficiency in the upcoming phases. All indicators are described in the following.

2.3.1 Efficiency of project management and logistics

A- Positive cost-efficiency indicators

- The project was granted headquarters in governmental buildings free of rent. The project's decision to request a leasing agreement was nonetheless well-advised so as to ensure the continued availability of the space even under changing administrations/leaderships. Moreover, the agreed rent remains much lower than the actual market rate of the project's offices.
- Based on the detailed calculation of needs and expenses, the project rented cars based on permanent contracts for transportation purposes, thus allowing for flexible movement and reducing expenses.
- The project formulated its salary scheme based on the criteria of MALR rather than international standards, which also significantly reduced expenses.
- The project disposes of a competent financial management unit, which manages to meet the standards of both WFP and the Egyptian government.
- The project's office equipment adequately meets its needs, yet not superfluous equipment or supply was purchased.
- The project was designed so as to assign a significant role to local communities and their organizations as well as volunteer work. This significantly reduced labor expenses within the project, since the budget for salaries remains rather low relative to the scope and diversity of activities and compared to similar projects.
- The project consulted technical experts based on contractually regulated recompense depending on the amount of actual work, which also reduced the expenses associated with technical consultancy.

B- Negative cost-efficiency indicators

- Since the project's salary scale is aligned with that of MALR as a partner, age and years of experience both generally and within a particular field were not taken into account in salaries, which are factors that should have been considered.

2.3.2 Efficiency of project activities

A- Positive cost-efficiency indicators

- The project’s rationale is based on an initial pilot model and generally determines its direction according to the baseline results. The latter revealed that the main obstacle facing climate change adaptation measures is a lack of information and certainty. Consequently, the project’s actual results is not restricted to direct beneficiaries, but is predominantly reflected in the adaptation and dissemination of ideas through awareness, imitation and reach out. This amounts to a cost-benefit relation in favor of the project.
- Initially, the project offered wide and expensive incentives to attract farmers to the activities, however, as soon as the activities yielded positive results, these incentives were reduced. Further future reductions were announced, yet this did not negatively affect the demand on the project. Rather, waitlists for participating in the project were formed.
- A rapid assessment of the approximate market price of a group of activity-related purchases compared to the price obtained by the project yielded the following results:

Table (4): Project Procurement Prices Versus Market Prices

	Over Market Price	Around Market Price	Under Market Price
Seeds per kg			
Agricultural machineries per hour ¹⁶			
Fertilizers per Kg ¹⁷			
Improved Mesqas per m ¹⁸			
Goats per head ¹⁹			
Equipment for the veterinary units			
Rehabilitation of the veterinary units ²⁰			

¹⁶ Due to cooperation agreements with governmental providers

¹⁷ Subsidized

¹⁸ The commissioned Mesqas were carried out at market prices obtained through auctions, while the Mesqas that were carried out by the partner NGO were below market price since they worked on the basis of cost recovery (non-profit)

¹⁹ Higher than the unofficial market price. The project cannot deal with unofficial markets since they are against financial regulations. However, the obtained price remains lower than the official market price obtained through tenders and deemed too high to accept.

²⁰ Carried out by partner NGOs

- The project largely relied on electronic dissemination and outreach techniques in the form of a website and Facebook page, which is a virtually expense-free and widespread method. The online community that was created in this manner is growing fast.
- The project selected activities with low expenses, such as goat raising and resorting to silage. All procurement processes took place through auctions and according to set regulations (the project recently appointed a purchase officer).
- Performance as it acquired experiences throughout the different phases, which was reflected in the financial situation as well. For instance, the contract with the goat suppliers was adjusted to provide more resources through adding a clause that declared the supplier responsible for vaccination and veterinary care during transportation in return for a relatively slight fee (25 pounds per goat). Similarly, the contract with insurance agency was altered, such that the insurance takes effect immediately upon delivery, rather than 48 hours after delivery, as was the case. Moreover, the project adjusted the Mesqa component due to the high prices in the private sector (commissioner) and transferred the work to the partner NGOs, who replaced the commissioner in a cost-covering non-profit manner.

B- Negative cost-efficiency indicators

- It would have been possible to save on project resources by involving beneficiaries in the improvement of Mesqas as labor in the form of in-kind contributions or through partial covering of expenses. This would have allowed for a larger number of Mesqas or for longer Mesqas using the same budget.
- In spite of all the efforts undertaken by the project to contact an officially registered supplier and in spite of the auctions during which suppliers offered unacceptably high prices, the fact remains that goats are available in some way or another to small and large-scale suppliers who operate unofficially. Perhaps a creative solution to this problem could have been found, as was often the case with other challenges that the project faces, so that goats could be obtained at better prices and higher quality.
- With respect to the goat activity, cost-benefit rates could have possibly been improved through a few complementary procedures that are low in costs but high in effectiveness, such as providing more regular veterinary services or providing fodder in the initial period during which beneficiaries have no income as yet (this period was relatively long due to the reasons mentioned in the effectiveness section **).

**Evaluation Question: To what extent were project activities time-efficient?
(Time Efficiency)**

Due to the late start of the project, what would have originally been the first year (March 2013-Mrch 2014) did not witness notable activities. The last annual report of the project (March 2015) reflects the activities of the second year, but it technically and financially refers to the target mentioned in the project document in the first year. Accordingly, the evaluation of time efficiency refers to the period 2014-2015 as the first actual project year.

Consequently, the budget allocated to the project actually amounts to \$1,389,146 up until the last presented report (table no. 5). According to the project report, the total of expenses reached approximately \$926,329 (table no. 6), i.e. around 67% of the planned budget, which constitutes a relatively small percentage in absolute terms, yet is largely justified in light of the initial difficulties that are mentioned above. The project attempted to compensate this circumstance throughout the following six months; by the time of the midterm evaluation the project had expended all available resources, with many activities now dependent on renewed funds

Table 5: Planned Project Budget

ITEM / ACTIVITY / ACTION	AMOUNT
Output 1.1. Community Mobilization	23,452.33
Output 2.2. Documentation of lessons learned	7,548.85
Output 1.4 Building Resilience in Agricultural Production	243,857.52
Output 1.5 Building Resilience through livestock and Poultry Production	164,399.95
Output 2.1. Training of Gov. Officials	79,329.68
Output 1.3 Introduction and use of Water Saving Irrigation	136,266.47
Output 1.2	36,639.65
Output 2.3	39,295.28
Output 2.4	39,703.32
Project Execution Costs	155,836.21
TOTAL	926,329.26

Table 6: Budget Distribution Across Project Duration

	Upon signing the agreement	One Year after Project Start	Year 2	Year 3	Year 4	Total
Project Funds	1,389,146	2,160,904	1,951,661	791,178	100,000	6,392,888

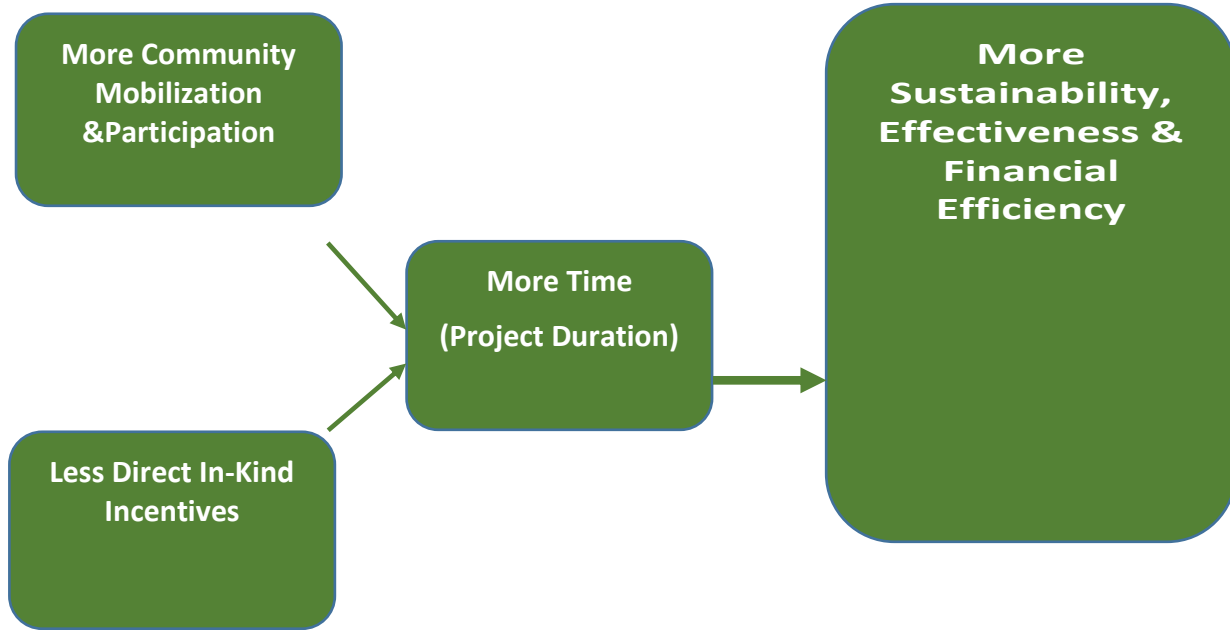
In general, the implementation of activities is largely, however not entirely in line with the time schedule with the mentioned adjustment. Nonetheless, some activities were not launched or were delayed.

The time-efficiency of the implemented activities varied from one activity to the other, with underlying causes also differing from case to case. Some of the activities that faced problems in this respect were:

- Activities that required high degrees of community mobilization and persuasion efforts, such as changing the types of crops and adjusting the farming seasons
- Activities that were met with serious obstacles, such as land aggregation agreements or delays in the delivery of machinery
- Activities that were delayed due to supply difficulties, most importantly the supply of goats and the equipment for the veterinary services which is being held by the customs authorities for bureaucratic reasons
- Activities that were delayed due to unexpected incidents such as the collapse of the irrigation system in one village
- With the increasing pace of implementation, some activities were delayed due to ceiling of the transfers to project count limited to US \$100,000 in the project Standards of Operation (this problem was less influential after the ceiling was raised to US \$200,000).

The first problem merits further discussion due to its importance and complexity, and its relevance to the project's rationale. Following a bottom-up approach requires intensive awareness, persuasion and community mobilization efforts in order to achieve higher levels of community participation and outreach. This in turn is crucial to capacity building and change in the community and can increase the feasibility and effectiveness of the activities as well as ensure sustainability. However, this requires much time and capacities. By contrast, a top-down approach, while faster and more time-efficient, lacks all these advantages and most importantly jeopardizes sustainability. From this perspective, the delay in some of the activities is outweighed by the high degree of community participation and organization that the project was able to achieve.

Figure 11: Participation and Sustainability



The above elaboration does not mean to suggest that all or most of the activities were delayed or interrupted, as illustrated in Table 7. The table depicts all activities, indicating that the vast majority of planned activities has either been completed or is underway.

		Crop Production		Animal Production	Irrigation	Information management
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Table 7: Implementation State of Projects Interventions

Governorate	Village	Heat tolerant Wheat varieties	Heat tolerant Sorghum	Heat tolerant tomatoes	Water saving cane	Intercropping	Change of sowing dates	Low – cost nutrients for improved harvest	Postharvest	Rabbit loans	Ducks loans	Goats loans	Bees loans	Alternative fodder	Nutrients for Poultry heat	Irrigation management	Sprinkle/drip irrigation	Linkage to on – line warning system	SMS in extension	
Aswan	Kalabsha		Sorghum in Aswan is threatened by birds attacks							Rabbits have poor performance in high temperatures of Aswan ,Luxor and Qena							Soil salinity			
	BenbanBahary																			
Luxor	Mansouria													Date wasps in the area						
	Kommier																			
	Nego ,eKebly																			
Qena	Halfa3																			
	Maharza																	Old land		
Sohag	Samhoud																			
	Ali Ibn Abi Taleb				Sugar cane is not planted in the area															
	Nazlet Ali																			
EL Naza El Bahria																				
Assuit	ELKhawalid																Old land			
	El ona																			
	El Loqa																			

2.4 Sustainability

Evaluation Question: Are the project activities and results likely to continue after its termination?

Source: Extracted by Evaluator based on project data

Done	On going	Not yet	Not applicable
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In strategy and application, the project offered strong elements that would enable or guarantee the sustainability of its activities and/or results.

A number of the project's results contain within them, due to their nature, the basis for self-sustainability, based upon which a number of other activities and results, such as the climate alert system, and disseminating and updating agricultural instructions to face them, as well as managing the rotating funds and supervising the projects funded by them, and managing the collection of assets and maintaining the irrigation canals.

However, the project was able to place strong foundations for sustainability, which introduce high opportunities for the continuation of other activities and results. The evaluation also revealed some factors that could decrease the chances of sustainability that were not taken into account. Below is a review of the supportive factors and threats.

A- Sustainability Supporting Factors

- The project is of joint ownership and responsibility between the Ministry of Agriculture and the World Food Programmed (WFP), and as such, the ministry is an essential partner in the project and a main beneficiary of its results.
- The project's unprecedented reliance on the full participation of the target groups and their organizations at community level in all stages.
- The project's coordinating committees, from the central level to the grassroots level, includes representatives from many ministries and governmental authorities, and the project succeeded in creating strong linkages with these.
- The project's alignment, not just with the national strategies and priorities, but also its alignment with and direct participation in the technical aspects of the Ministry of Agriculture's action plans. This was represented in the project's adoption of the varieties that the ministry targets spreading as part of its strategy. It was also seen in the adoption of raised bed farming, and the rehabilitation of Mesqas, both of which are part of the Ministry of Agriculture's nationwide aims. Furthermore, the project makes a major contribution to the National Wheat Campaign through applying and spreading the general recommendations issued by the Crop Research Institute (affiliated to the Ministry of Agriculture), especially Upper Egypt. All these factors create a direct benefit for state organizations in supporting the project's sustainability on an institutional level and merging its components within its structure.
- The inclusion of the project's offices, whether the headquarters or the governorate offices, inside governmental directorates, and through official decisions. Further, in order to protect the project's headquarters in light of the repeated changes in leadership, the existence of an institutional governmental party that takes responsibility for, and participates or takes complete ownership of all the project's activities
- The project's reliance in its technical aspects on permanent official research bodies, some of which are affiliated with regional universities, while other are affiliated to governmental research centers (most of them are affiliated with the agricultural research centers affiliated to the Ministry of Agriculture). Even the experts who cooperated with the project on an individual basis belong to the same authorities, which

created organic ties and mutual concerns in the project with the related research institutes

- The project's reliance in its agricultural components on domestic varieties, which were recommended by Egyptian research institutes, rather than imported crops. This increases the chances of sustaining execution through the existing mechanisms, whereby it would have been much more complicated and difficult had the project relied on imported seeds, especially as the seeds used are breeding (fundamental) seeds, which means they can be used for replanting for 4-5 years
- The existence of a simplified plan and explicit or implicit agreements for the handover after the completion of the project
- The office space of the Headquarters is additionally secured through an open-ended legal lease contract, so long as the project continues the formalization of relations with the partner authorities, and documenting in different ways through cooperation agreements that define current and future responsibilities

B- Sustainability Threatening Factors

The following factors could diminish the potential of project sustainability. Overall, their weight and effect are much slighter than those of the sustainability supporting factors, and are furthermore amenable to correction, as referred to in the recommendations:

- Although there is no dispute over the fact that communal participation and volunteer work are in and of themselves positive factors which support sustainability on principle, nonetheless, the degree of dependence on them in certain activities surpassed the secure limits, or at the very least will surpass them by the end of the project. This applies to the dependence on volunteers to operate the Climate Change Centers in the partner NGO and committees affiliated to the NGOs in the different activities, as well as the facilitators who do the day-to-day supervision on most of the activities in the community
- Some of these volunteers, such as university graduates who are working on the Climate Warning System as well as the board members of the partner associations themselves could change their priorities or directions upon the emergence of other elements, such as leaving the village or beginning demanding professional work, or entering other projects in completely different fields
- Others, such as facilitators and board members, could become unable to continue executing current and future activities with the same level of competence. Even before the project is completed, and with its significant role in supporting, facilitating and managing the operations, the inability of partner associations to absorb the activities and the burdens associated with them has indeed been one of the reasons behind delaying the execution some of the activities, or executing them as a slow pace. Further, some of the NGOs' representatives expressed skepticism over the associations' capacity to manage more components through its own capacity alone after the project is completed

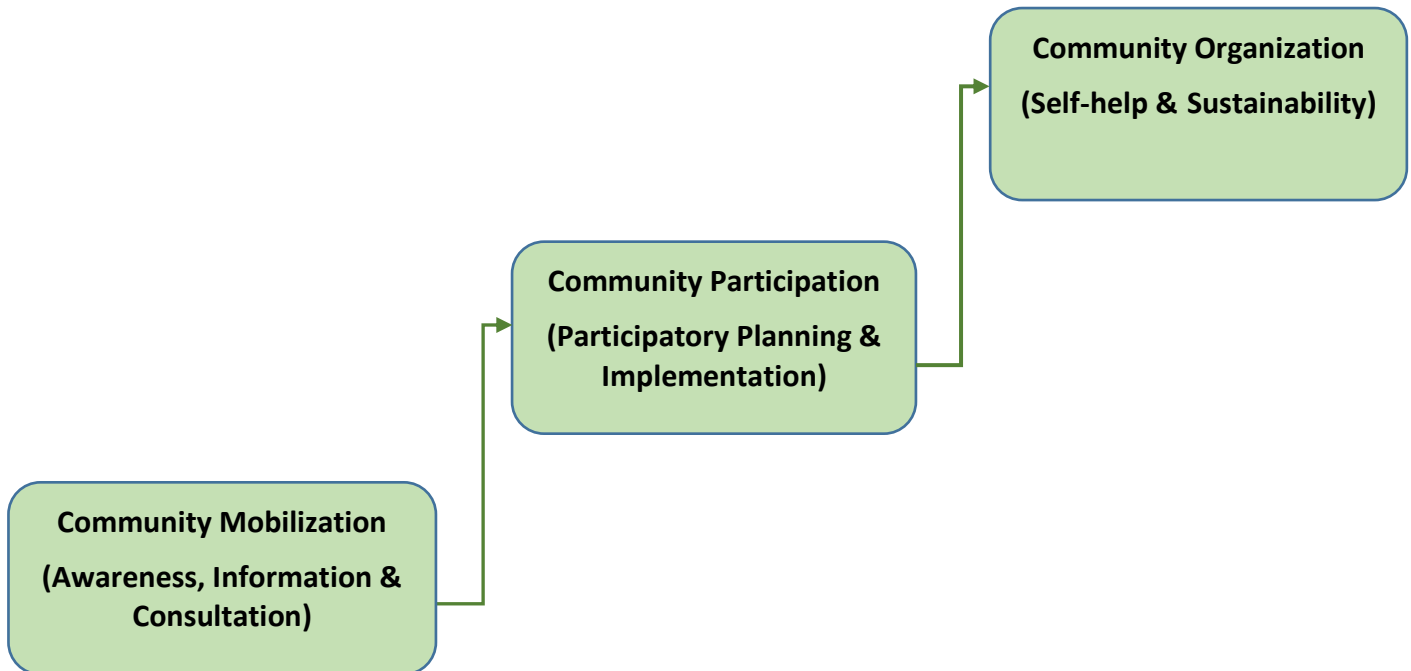
- The final facet of the last two factors is the low level of recourse to and integration of workers in related authorities on a fundamental level in the project's activities (i.e. agricultural associations, agricultural guidance, veterinarian services, information centers in the center and the governorate). Although the workers were represented in the coordination committees and participated to varying extends in the planning and execution, and while some of them received training through the project, nonetheless, the development of their capacities in the activities as an active factor did not occur at a sufficient level, which could have eased the burden on the volunteers' efforts, and contributed to supporting sustainability
- The partner NGOs were not provided with enough resources to fund the management and sustainability of the activities, as the 3% they receive from the price of goats is extremely low, and does not fulfill the requirements from it currently or in the future
- Despite this high level of dependence on partner associations, yet the building up of their institutional in-kind and human capacities were not given the amount of attention commensurate with the level of work and challenges
- Certain activities require inputs that aren't always available, such as seeds and fertilizers, or expensive machinery which is not available in the suitable numbers and quality for the area, such as plowing machines and mowers and waste grinders

Evaluation Question: Has the project sufficiently built local capacities, ownership, and responsibility?

In all phases of the project cycle and, at all levels and with all relevant stakeholders, the project applied the participatory approach. However, at the community level, the kind and grade of participation, sharing responsibility and carrying ownership was not only very significant and effective, but also pioneering.

In this respect, the involvement of the local communities evolved throughout the process, starting with community mobilization and reaching active community participation, and finally community organization (figure 12).

Figure 12: Development of Community Involvement in Project Activities



There is no doubt that this level of community organization and what it requires in awareness activities, training and capacity building, and their results in building confidence, capacity, enablement and ownership are considered among the most important results, and not simply that, but also social assets that are the foundations of sustainability.

Evaluation Question: Do the applied interventions have potential for replication?

The chances of spreading the project's ideas and activities and their potential for replication are very high. In fact, they have already started through the adoption of varying numbers of the project's practices, whether by non-beneficiaries within the project's villages, or in neighboring villages. However, the numbers of these cases have yet to be accurately monitored and quantified, yet most of the respondents during individual and group meeting reported such cases in their areas, mainly related to agricultural practices and developing irrigation canals, as well as producing alternative fodder.

This high potential for replication is due to various factors, the most important of which are:

- The project's activities meet a real need and priority for farmers, especially after the boom the project achieved in awareness among farmers of climate change issues and their effect on them

- The project’s activities coincide the programs executed or sought by government bodies, which facilitates these bodies’ support for any activities that fall in line with these projects, or at the very least do not obstruct them
- The baseline studies proved that the most important factors for not adopting climate change adaptation mechanisms are lack of knowledge and lack of belief (and not funding, as many assume). As such, the potential for spreading and replicating the main results of the project do not depend on launching a new project or receiving financial support from the state
- Spreading the ideas of the project was difficult at the beginning, due to the lack of trust and fear of risk, and as such it required a lot of effort for persuasion. However, after the achievement of tangible results, and word spread of these results, whether through targeted awareness forums and visits to the project’s fields, or spontaneously through acquaintances and relatives, applying the project’s practices became a target, despite the withdrawal of in-kind incentives, and the non-existence of such incentives for farmers who adopted the practices
- The project gave local communities that worked in it, as well as neighboring communities, a model and example, and a lesson that farmers self-organizing and helping themselves face their own problems can help them improve their situation and solve their own problems

3 Conclusions and Recommendations

3.1. Overall Conclusions

- I. Prior to addressing the DAC Evaluation Criteria (relevance, effectiveness, efficiency and sustainability²¹), it is important to mention that the project “Building Resilient Food Security Systems to Benefit the Southern Egypt Region project” is of a **strategic value** that goes beyond standard evaluation criteria. This is due to its **innovative and pioneering nature**, from two different points of view:
 - a) The project philosophy and design represents a conceptual innovation in the **WFP-programmatic scheme**, where it represents a new and comprehensive model for increasing food security in the frame of climate change adaptation.
 - b) The project also represents a pioneering model in the scheme of **community-based interventions**, where it literally started from “scratch”, informing the people of the meaning of the new vocabulary “Climate Change” and ended with a community-led climate change adaptation package.

Generally, the project evidently succeeded in proving the reasonability and justification of the model from both points of view.
- II. The project concept and strategy are **highly relevant** to national strategies for both agricultural development and climate change adaptation, as well as to the needs and

²¹ Impact cannot be included in a MTE

priorities of the target groups. Moreover, the project implementation plans conform to its concept and the approved project document. The project design characteristics and assumptions are not only still valid, but also more relevant compared to the time in which the project was identified and designed.

- III. Until the MTE, the project was implemented in a widely effective manner in accordance with the project design. The project adaptation measures have demonstrated significant success. However, the progress towards objectives relatively varies from one activity to another. Community mobilization, building resilience in agricultural production and water solutions were the most successful and effective activities.
- IV. Regarding the outcome objective: “Improve the adaptive capacity of the Southern region of the country in the face of anticipated climate-induced reduction in food production”, the project succeeded in increasing the resilience to climate change for direct beneficiaries and some of non-beneficiaries who adopted project’s practices. This is clear in the increase in agricultural productivity, the income diversification, the achievement of community organization, water saving, and increasing community’s awareness of climate change issues. However, the wide scale, long-term results are dependent on the project’s outreach, dissemination and up-scaling strategy, as well as on the cooperation and capacity of the partner NGOs’ along with other stakeholders, most of which are affiliated to the Ministry of Agriculture.
- V. The project was specifically distinguished in applying a participatory approach at all levels, beginning with the grassroots level, to the central level in Cairo, as well as and in all phases, beginning with project design and planning phase to implementation of activities based on community ownership and responsibility.
- VI. Most efficiency indicators clearly point to a **cost-efficiency** for most activities of the project. Regarding **time-efficiency**, in general, the implementation of some activities is relatively in line with the time schedule, disregarding the late start of the project. The time-efficiency of the implemented activities varied from one activity to the other, with underlying causes also differing from case to case. However, a main reason for some delayed activities is giving much value and priority to community participation, building the basis for more sustainability. Intensive awareness, convincing efforts and community mobilization were very time-consuming, particularly regarding critical or completely unknown innovations.
- VII. Some of the project results are relatively sustainable by their nature, such as raised awareness, changed attitude and community mobilization and organization. However, the project placed strong foundations to sustain the other results. In strategy and application, the project offered strong elements that would enable or guarantee the **sustainability** of its activities and/or results. Some factors that could decrease the chances of sustainability are identified.
- VIII. The ratio of women in the project staff (35%), training participants (30%) and volunteering facilitators (30%) is satisfactory. Although crop cultivation and land ownership is almost entirely a male-dominant issue in SE, the project endeavored to work with females, reaching a 15% rate of females among the beneficiaries of agricultural interventions (demonstration fields and land holding consolidation), which is a very good ratio in this context. However, regarding the goats lending activity, the project did not sufficiently address the gender issue.

The project’s document focused on women as a majorly targeted group in the micro-financing (revolving fund) activities. Indeed, the socio-cultural conditions represented an obstacle hindering women’s involvement, since most families rejected the idea that women deal with official documents. Therefore, in the process of goats lending, men took over the official aspects, while it is assumed that women are the actual owners of the goats, and the FGDs indicated that in many cases. In spite of those obstacles, the project could have given more attention to the gender aspect, instead of easily giving in to local traditions.

Finally, the following table includes the **evaluator performance rating** of the project aspects and components.

Table 8: Project Performance Rating

Evaluation Criteria	Sub-Elements	Rating²²
Project	Overall	<i>Highly Satisfactory</i>
Innovation/Pioneering	Conceptual Innovations	<i>Highly Satisfactory</i>
	Technically	<i>Satisfactory</i>
	Community Involvement	<i>Highly Satisfactory</i>
Relevance	Overall	<i>Highly Satisfactory</i>
	Relevance to National Strategies	<i>Highly Satisfactory</i>
	Relevance to beneficiaries’ needs and priorities	<i>Highly Satisfactory</i>
Effectiveness /Results	Overall	<i>Highly Satisfactory</i>
	Community Mobilization	<i>Highly Satisfactory</i>
	Climate change and adaptation online application	<i>Satisfactory</i>
	Water saving irrigation	<i>Highly Satisfactory</i>
	Building resilience in agricultural production	<i>Highly Satisfactory</i>
	Building resilience through livestock and poultry production	<i>Marginally Satisfactory</i>
	Training of government technical staff	<i>Satisfactory</i>
	Sharing project results and lessons learned and mainstreaming new approaches in local and national planning	<i>Satisfactory</i>
	Documentation of lessons learned and best practices	<i>Marginally Satisfactory</i>
Efficiency	Overall	<i>Satisfactory</i>
	Cost efficiency	<i>Satisfactory</i>
	Time efficiency	<i>Satisfactory</i>

²² The overall rating of an element is not a mathematical average of the sub-elements’ ratings, since the sub-elements are not equal in importance and impact on the entire result.

Sustainability	Overall	<i>Highly Satisfactory</i>
Gender Aspect	Overall	<i>Marginally Satisfactory</i>

3.2 Overall Recommendation

Framework Recommendation²³

Reforming and significantly building the capacity of extension services, veterinary services and agricultural cooperatives is an indispensable pre-condition for strategic and wide-scale agricultural and rural development in Egypt, in particular regarding the adaptation to climate change

- I. It is highly recommended to extend the project duration on a no-cost basis for at least one year above the originally planned duration. This is not only to compensate for the late start of the project, but also due to the identified strong correlation between the very time-consuming community mobilization and organization on one side and the effectiveness and sustainability of the project activities on the other side.
- II. The timeframe of the project results' matrix should be adjusted in accordance with the delayed start and the resultant shifting of the activities.
- III. The project is particularly diverse and wide in scope, with respect to areas of intervention, activities, as well as spatial allocation. The number and extent of the activities, as well as the number of beneficiaries and target groups will continue increasing. This necessitates an elaborated, effective and unified monitoring system that provides access to aggregated and disaggregated data through adequate software.
- IV. The monitoring system should not be restricted to the indicators included in the project log frame. In light of the experience gained, some indicators in the project log frame should be adjusted, while other indicators and sub-indicators should be developed.
- V. The monitoring system is vital for the follow-up on activities, the improvement of performance, the safeguarding of effectiveness and the facilitation of decision-making. Moreover, it would represent the basis necessary for the final evaluation of the project. Therefore, it should be developed and launched by competent experts and staffed appropriately. The project officers should be trained on using the system.
- VI. The project has overall and detailed experiences that constitute remarkable success models, however they require quantitative assessment and documentation on different levels:
 - a. Rigorous scientific documentation for research purposes
 - b. Educational documentation for of extension and training purposes
 - c. Advocacy documentation for lobbying purposes and supporting decision-makers

²³ The evaluator is aware that this recommendation is not within the mandate or the capacity of the project; however, it addresses the framework on which the replication of the project depends.

- d. Media documentation for awareness and outreach purposes
- VII.** The baseline study revealed that a failure to adopt the new agricultural practices did not primarily result from the associated expenses but from the lack of information regarding the technical know-how and the uncertainty about results (fear of taking risks). Nonetheless, it was necessary in the beginning for the project to offer in-kind incentives to beneficiaries so as to encourage them to participate. However, now that the adopted practices have proven very successful, the priority should shift to disseminating the information and training as well as offering technical supports to reduce risks, while in-kind support may be reduced and ultimately terminated.
- VIII.** In order to achieve the very ambitious quantitative project targets, the project needs a comprehensive strategy for outreach and dissemination, formulated by high qualified experts and reflected in action plans for the next years.
- IX.** The above recommendations require a re-distribution (re-allocation) of available funds in favor of adaptation through capacity-building and wider outreach and dissemination.
- X.** Due to the different levels and kinds of experience among project officers in the different governorates, the following is recommended:
 - a. Developing a salary scale that takes into account differences educational backgrounds and years of experience
 - b. Organizing trainings that include professional and soft skills
 - c. Allowing for more experience exchange through establishing a monthly meeting as well as other irregular meetings/visits
- XI.** A detailed hand-over plan for the end phase of the project should be put in place so as to achieve greater sustainability of results and activities.

3.3 Specific Conclusions and Recommendations

3.3.1 Community mobilization

Community mobilization was one of the project's most successful activities, whereby its effects surpassed the achievement of direct outputs and realized tangible and sustainable social change. This was true whether regarding awareness on climate change and how to adapt to it, or (perhaps more importantly) through building the community's sense of self-confidence and belief in its abilities, and inducing NGOs to abandon the idea of charity work and engage in development work that is directly productive. This chiefly contributes to increasing the potential for sustainability for the project's activities and results. Further, what adds to the value of this component is its potential for replication, without the necessity for extra costs or a supporting authority. Since partner NGOs are the main center of gravity for the project, whether in executing activities during its duration or achieving sustainability following it, the following recommendations are called for:

1. Building up the institutional capacities of partner NGOs, which includes:

- Creating a **training program** to build the institutional capacities of NGOs generally, and which includes main points addressing their work, such as management, financial management, computer skills, negotiation, communication, and the legal grounds that govern them
 - The program should include a comprehensive **training portfolio** of high quality and professionalism in terms of content and methods of presentation.
 - Training should occur on two levels: a) for the target group directly (Boards of Directors, employees, committees and project facilitators), and b) training of trainers (TOT) targeting distinguished trainees.
 - The ownership of the training portfolios should be under the partner NGOs to undertake the training for other NGOs, for which a need for training arises, with increasing adaptation of project ideas and activities. Such training should occur with financial compensation that can contribute to the resources of the partner NGOs
 - The same training course should be arranged with adjustments for agricultural cooperatives in the project villages.
2. The project should not depend fully on volunteer work in managing its activities through partner NGOs, as this will make it impossible to sustain and grow the project's activities, especially after project termination.
 3. A secure level of financial sustainability must be achieved in the Partner NGOs, and it is recommended that in this area, the NGOs should be a **service providers** in the frame of project activities, such as acting as a mediator in providing seeds or facilitating the provision of extension or veterinary services, as well as raising the overhead that the NGOs receive in return for managing the project activities (the 2% it received of the price of goats is very low).
 4. The partners NGOs should create a union/bound. This would allow for communication and exchange of expertise during the project. Further, it should work on the project's sustainability after its termination in coordination with government bodies that would take up specific roles in accordance with the handover plan at the end of the project. The union can also provide support to individuals and associations that wish to apply one or more of the project practices.

3.3.2 Climate change and adaptation online application

Despite the fact that this activity had not been working at its full capacity yet, it is nonetheless very promising and welcome among all partners, as it is one of the most important factors in terms of effectiveness, spread and sustainability. Great attention and efforts should be given to this component including:

1. The dynamism of application, i.e. guaranteeing the expansion of the component related to agricultural practices to include other crops and updating it to include adaptation methods in accordance with the renewal of conditions, on a permanent basis. This

requires a detailed plan on the roles, funding and ownership, and obtaining ministerial decisions, as part of the project's handover.

2. Expanding the circle of application users and information disseminators through integrating and training the largest possible number of related local and mediating organizations in its use. This is in addition to partner NGOs, such as agricultural cooperatives, extension agents, the information centers at governorate and district levels.
3. Promoting the project electronic community through Facebook to announce it on a wide scale (40% of Egyptians use Facebook, which provides a major opportunity for dissemination).
4. The use of other means to disseminate the results of the electronic application, such as SMS on mobile phones (the rate of mobile coverage in Egypt is 117% of the population).

3.3.3 Water saving solutions

It is important here to mention that this activity does not only include the rehabilitation of Mesqas as would appear at first glance, but rather it also includes all practices related to saving water, such as introducing water saving varieties, raised bed planting, laser leveling of soil, crop consolidation, new scheduling of irrigation, clearing canals of weeds, and strip irrigation.

All these technological interventions met great success, which led to the provision of at least 30% of the irrigation water. Further, the organizational factor had a major impact on the success of these interventions, which comprised of establishing water user associations. Those associations in some cases acted as contractors for the rehabilitation of Mesqas, which led to decreasing costs. However, there are minor weaknesses which are advisable to address, such as:

1. The association should not work as an executive contractor and as a recipient of the completed canal simultaneously, as this represented a kind of conflict of interests. Concentrating the association's work to execution is more effective and efficient, and as such it is better to continue in this role while other parties should carry out the follow-up (e.g. a committee consists of representatives of the Irrigation Sector of the Ministry of water Resources and Irrigation (MWRI), Irrigation Directorate at governorates' level, National Water Research Centre (NWRC) and /or universities)
2. Developing Mesqas represents a demand with immediate and clear returns, and as such does not require large efforts for convincing, but rather requires larger efforts for organization and the resolution of conflicts. It is possible that the beneficiaries can contribute to the rehabilitation of Mesqas, whether through labor or contributing the required resources, or even through financial contribution.

3.3.4 Building resilience in agricultural production

The following factors guarantee that there is no doubt regarding the success of this component in achieving its targets, not only on the level of direct output, but also in the outcome in terms of building resilience and increasing income and food security for the beneficiaries:

- The clear increase in production
- The increase of demand on farmed land from one season to the next, to the point where there is currently a waiting list
- Numerous cases of adopting one or more of the project's agricultural practices; although these cases are not yet documented, they were reported during all meetings
- Demand for the yield to be used as seeds in the land of non-beneficiaries in the project villages and neighboring villages

However, the effect of this over the short period that has elapsed of the project's duration is still restricted to the direct beneficiaries, and farmers who have adopted one or more of the practices applied in the project. The long-term impact depends mainly on two factors:

- The cooperation of the authorities responsible for agriculture, which is dependent on the ability and willingness to cooperate
- The project's outreach and dissemination efforts

Regarding the responsible authorities, in addition to the fact that WFP's main partner is the Ministry of Agriculture, several authorities affiliated to the Ministry of Agriculture or other related ministries were integrated into the Central Steering Committee and the coordination committees at the other levels. Furthermore, the project works in accordance with the state strategy. However, the structural weakness in certain responsible actors (agricultural extensions service and agricultural cooperatives) threatens the sustainability of the project's success. Nonetheless, the project can realize some improvements in its villages., and as such, the following is advised:

- Organizing training programs for the agricultural cooperatives and extension services.
- Integration of agricultural cooperatives and extension services to a larger extent in the execution of some of the project activities, such as the reliance of agricultural extension workers as trainers after they are trained, and cooperation with the NGOs in providing the requirements for production or communication with the authorities responsible for producing seeds or contributing to marketing some of the crops. This is in addition to what was previously mentioned regarding effectively integrating them in following up on climate monitoring and disseminating its instructions.
- Conducting quantitative studies and establishing monitoring system for the agricultural activities
- attempting to grow other crops in addition to cow peas as intercropping produce, since not all beneficiaries need cow bean to the same extent

3.3.5 Building resilience through livestock and poultry production

Livestock production is an appropriate means to build resilience, and selecting goats in particular is indeed advisable due to their heat tolerance, low expenses and short reproduction cycle. However, implementation difficulties relatively hampered this activity's success, though not to an irreversible extent. Furthermore, the project and the partners did in fact acquire sufficient experience to address many of the negative issues. To increase this activity's effectiveness, the following is recommended:

- Attempting a second time to procure goat supplies of better conditions and at advantageous prices without violating any financial regulations (contacting livestock cooperatives or even establishing small local firms or contracting livestock institutions and institutes to raise the required breed)
- Providing high-quality bucks promptly in larger numbers than was decided (one buck per village), since the ideal ration amounts to one buck per 20-15 goats
- Supporting preventive veterinary care rather than just vaccination and care in the case of illness, in addition to providing sustainable resources for the recompense and transportation of veterinaries. For instance, future installments couple require that the beneficiary pay a regular monthly amount to the NGO in order to improve veterinary services and provide medicine (special additional insurance), while the project may commit itself to covering the expenses of current installments of goats that have not birthed as yet.
- Monitoring the cases of goats that have not birthed as yet among the currently delivered installments (i. e. the goats that haven't entered the reproduction cycle), and providing in-kind support to fodder needs (so that the funds are not expended on other items). This is due to the fact that fodder expenses are not possible for poor families to bear for several months, as is currently the case for some beneficiaries.
- Extending the period for the repayment of current installments to by another six months after the bucks are delivered

