Baseline Report

Household Listing and Farm Household Baseline Surveys for the Food Security and Agribusiness Support (FAS) Activity and Improving Maternal and Child Health Nutrition Services (IMCHN) Activity

Activity Name: Evaluating Impact and Building Capacity (EIBC) Project

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List of Abbreviations

ARDII	Agribusiness for Rural Development and Increasing Incomes
BMI	Body mass index
BMIZ	Body mass index z-score
CAPI	Computer-assisted personal interviewing
CAPMAS	Central Agency for Public Mobilization and Statistics, Egypt
CDDS	Child Dietary Diversity Score
DHS	Demographic and Health Survey
EIBC	Evaluating Impact and Building Capacity
EGP	Egyptian pounds
ELMPS	Egyptian Labor Market Panel Survey
FANTA	Food and Nutrition Technical Assistance
FAS	Food-Security and Agribusiness Support
FtF	Feed the Future
HAZ	Height-for-age z-score
HHDS	Household dietary diversity score
HIECS	Household Income, Expenditure, and Consumption Survey
IFPRI	International Food Policy Research Institute
IMCHN	Improving Maternal, Child Health and Nutrition Services
IYCF	Infant and young child feeding
MOALR	Ministry of Agriculture and Land Reclamation, Egypt
MOHP	Ministry of Health and Population, Egypt
N	Number of observations
ORS	Oral rehydration solution
RCT	Randomized control trial
SD	Standard deviation
SE	Standard error
Sign.	Significance level
SMS	Short Message Service
SS	Summer season
TV	Television
WS	Winter season
ZA	El-Zanaty and Associates

EXECUTIVE SUMMARY

This baseline report is part of a project funded by the United States Agency for International Development (USAID) and implemented by the International Food Policy Research Institute (IFPRI) to evaluate the Feed the Future Egypt, Food-Security and Agribusiness Support (FAS) and the Improving Maternal and Child Health and Nutrition Services (IMCHN) projects. The evaluations of FAS and IMCHN are conducted in two main phases: (1) the baseline study, and (2) the evaluation study. This report presents the results of the baseline study.

For the baseline study, IFPRI in collaboration with El-Zanaty and Associates conducted a household listing survey from March 29th to April 2nd, 2018 followed by a farm household baseline survey from April 9th to May 8th, 2018 in six Upper Egypt governorates (Assiut, Beni Suef, Luxor, Menya, Qena, and Sohag). A total of 40 enumerators, 10 technicians (for the collection of anthropometry data within the Farm Household Survey) and 10 supervisors were involved in the data collection. Data for both surveys was collected using Computer Assisted Personal Interview (CAPI) technology.

This baseline report summarizes the findings of both surveys. The results of the listing survey analysis serve to inform USAID about farm households' project participation and treatment by FAS and IMCHN, in addition to establishing the sampling frame for the baseline study. The results of the farm household baseline survey analysis determine the baseline indicator values against which FAS and IMCHN will be evaluated in Phase 2. In addition, the analysis of the farm household baseline survey provides new evidence that can help to improve policy and program design and implementation to better leveraging agriculture-health-nutrition linkages in Upper Egypt.

Household Listing Survey

In order to construct a sample for the listing survey, IFPRI relied on information provided by FAS and also selected a comparison group based on a random walk method. For the FAS farmers, IFPRI selected 1,918 farmers out of a list of 3,333 farmers provided by FAS based on a stratified sampling approach following the key parameters of the evaluation project design. The targeted sample size for the comparison group was 2,111 farm households, equivalent to 110.1 percent of the targeted treatment households. To construct a valid comparison group, households were randomly selected, using a random-walk method. To be comparable to FAS households, comparison group households needed to meet key FAS eligibility criteria. Unlike in many previous surveys using the random-walk method, which defined the starting point at a central landmark in a cluster (e.g., main market, mayor's office, school, bus stop), IFPRI defined the starting point as the address of the last visited FAS farm household to reduce the so-called "main street bias." As an indication for accurate implementation of the household listing survey and the formulation of survey questions (which are identical for the treatment and comparison groups), none of the randomly selected non-FAS households reported to have committed to a FAS forward contract and only 11 households (1.0 percent) reported that a household member ever attended a FAS training.

Challenges related to FAS: Field work related to the household listing survey revealed critical problems in identifying selected FAS farm households that were actual project participants. In total, only 60.3 percent (1,135 out of 1,918) of the listed FAS farmers could be identified and verified by the FAS partner associations to participate in the project. There was no trace of one in four listed FAS farmers (24.9 percent), meaning that the name of this person and his personal information was unknown to the association representatives and other local leaders consulted. In one association in Assiut, no listed FAS farmer could be found. In many other associations, a considerable number of listed FAS farmers could not be identified. Even more concerning than the low number of participating farmers as identified by the FAS partner associations is the low number of possible FAS beneficiary households. The collected data of the household listing survey suggest that only 69.2 percent of all verified, listed FAS farmers committed to a FAS-facilitated forward contract signed individually or by the partner association on behalf of the participating farmers. By definition, all farmers listed on the FAS list, however, should have committed to a contract. Furthermore, only 14.9 percent of all verified, listed FAS farmers (175 individuals) ever attended a FAS training for producing and marketing vegetables or herbs and spices.

Challenges related to IMCHN: IFPRI developed the survey sampling for the baseline study of IMCHN evaluation based on information from the project's Implementation Plan and different survey data sources of the Egypt Central Agency for Public Mobilization and Statistics (CAPMAS) and Raeda Refia (community health workers) distribution per governorate by MOHP. IFPRI's estimates suggest that, if each Raeda Refia serves 500 households on average as given by the program's design, at least every fifth randomly selected target households in any considered Upper Egypt governorate except Menya should be served by a Raeda Refia under the least-targeted coverage scenario. Under the most-targeted coverage scenario, more than two-thirds of randomly selected target households in any considered Upper Egypt governorate except Menya should be served by a Raeda Refia. In Beni Suef and Luxor, there should be full coverage, if the program is well targeted. Overall, IFPRI estimates suggested that roughly 30–40 percent of all sample households should have been visited by a Raeda Refia within the past year. By program design, these households should have been visited four times over the past one year. However, results from the listing survey suggest that only 1.5 percent of these households (33 households) received a visit from a Raedat Refia in the 12 months prior to the household listing survey. Of those 33 visited households, more than half (19 households) were visited once in the past 12 months, about one-fourth (9 households) were visited twice or three times, and less than one-fifth (5 households) was visited four or more times. This finding suggests that the Raedat Refiat program reaches a much lower percentage of the target population than planned, at least in the sample areas of IFPRI's baseline study.

Farm Household Baseline Survey

The *farm household baseline survey* was completed for a total of 2,246 farm households, 1,129 FAS farm households and 1,117 comparison group farm households. In addition to determining the baseline indicator values against which FAS and IMCHN will be evaluated in Phase 2, the survey also represents the most comprehensive farm household survey conducted in Egypt to

date as it combines agricultural, household, and nutrition information. Analysis of the survey thus provides new evidence that can help to improve program design and implementation to better leveraging agriculture-health-nutrition linkages in Upper Egypt.

Results from the survey show that the farming systems are very intensive. There is very little fallow land, nearly universal use of synthetic fertilizer, and widespread usage of pesticides on all common crops. Preliminary results even suggest that fertilizer and pesticides are sometimes overused. The vast majority of farmers use traditional flood irrigation. Less than 2 percent of farmers have drip irrigation systems. Further improvements in productivity and profitability can thus be expected from more efficient use of fertilizers and pesticides and more efficient irrigation systems. Nearly all farms in the survey are highly commercialized. Most harvest batches were sold all at once—and not sold in different charges to several buyers. The marketing patterns also suggest that the interviewed farmers are well integrated in specialized value chains for (most of) the cultivated crops.

Agriculture links to nutrition directly through the home consumption of farm produce and indirectly through farm incomes, among other channels. We found from the survey that farmers cultivated crops largely for commercial purposes and kept only small shares of the harvest for own consumption, implying that the indirect, income link generally dominates the direct, own-consumption link. With respect to the income pathway, the findings support the importance of "income-food consumption" channel, where higher incomes lead to more diverse diets. But there are also indications that increasing income may lead to overconsumption of high-calorie foods that affect nutrition. The nutrition practices that the survey assessed revealed several areas for improvement. Only half of all children were being breastfed age-appropriately. We found that the feeding practices of children 6 to 23 months of age were often inadequate: Few children were fed iron-rich foods, feeding frequency was too low, and the dietary diversity of children's meals was suboptimal. The assessment of the dietary diversity of mothers and that of the household revealed a similar picture: The consumption of micronutrient-rich foods, such as animal-source foods and fruits, was limited.

Finally, any agricultural and nutrition intervention will need to take into account the very low literacy levels of the study population: Over half of the mothers of children aged 0 to 5 years could not read, and only one-third were able to read fluently. While nearly all households have cellphones, the use of text message for nutrition and health education is therefore likely to have little impact.

Next Steps

Phase 2 of the FAS & IMCHN evaluation project is planned to start in April 2019 and will consist of the evaluation study. It will include the implementation of the farm household follow-up survey, analysis of this follow-up survey, and estimation of changes in project outcome variables between the baseline survey and the follow-up survey that plausibly can be linked to the interventions of FAS and IMCHN. IFPRI will present the findings in the evaluation report.

I. OVERVIEW OF THE FAS-IMCHN EVALUATION PROJECT

The United States Agency for International Development in Egypt (USAID/Egypt) awarded the International Food Policy Research Institute (IFPRI) a grant for the implementation of the Evaluating Impact and Building Capacity (EIBC) project. One important component of the EIBC project is a joint evaluation of two USAID-funded projects that are implemented in rural Upper Egypt. The first project is the Feed the Future Egypt, Food-Security and Agribusiness Support (FAS) project;[1] the second project is the Improving Maternal and Child Health and Nutrition Services (IMCHN) project.[2]

A. Evaluation Project Objectives

The overarching objective of the FAS-IMCHN evaluation project is to learn whether promotion of agribusiness activities, along with nutrition and health promotion activities, improves rural household livelihoods, household dietary quality, and nutrition of young children and their mothers (IFPRI 2017a, 2017b). The evaluation project will also contribute to a better understanding of the linkages between agriculture, health, and nutrition, where gender issues are likely to play a pivotal role.

The purpose of the evaluation project is to:

1) Estimate the effects of FAS on project outcome indicators—especially household income (measured by total household expenditure), household and individual dietary diversity, and maternal and child nutrition—among farm households; and

2) Estimate the effects of IMCHN on maternal and child health and nutrition knowledge among mothers/caretakers of young children from farm households.

Consistent with the objectives of the FAS-IMCHN evaluation project (IFPRI 2017a), the evaluation has been designed to assess the effects of FAS and IMCHN on a number of primary and secondary outcomes.

The primary outcome variable of the FAS evaluation is:

Total household expenditure per capita, as proxy for household income.

The secondary outcomes of the FAS evaluation are:

1) *Farm production and output*, measured by yields and sold harvest shares of commonly cultivated crops by season;

[1] We use the abbreviation "FAS" interchangeably to refer to the project and the project staff.
[2] We use the abbreviation "IMCHN" interchangeably to refer to the project and the project staff.

2) *Household dietary diversity*, measured by the Household Dietary Diversity Score (HDDS) (Swindale and Billinski 2006);

3) *Women's dietary diversity*, measured by the Minimum Dietary Diversity for Women (MDD-W) score (FAO and FHI 360 2016);

4) *Infant and young child feeding (IYCF) practices*, measured by the standardized IYFC indicators (WHO et al. 2010); and

5) *Nutritional status of young children and their mothers*, measured by anthropometric indicators (height-for-age z-score [HAZ], weight-for-age z-score [WAZ], and BMI-for-age z-score [BMIZ] for children and body-mass-index [BMI] for women), and prevalence of child stunting, wasting, and overweight and prevalence of women's overweight and obesity.

The primary outcome of the IMCHN evaluation is:

Child and maternal health and nutrition knowledge of mothers/child caretakers, assessed based on a series of questions on knowledge of danger signs of malnutrition and illness during pregnancy and childhood, recommended diets and unhealthy diets, appropriate IYCF practices (breastfeeding and complementary feeding), optimal hygiene practices for the prevention of diarrhea, and health risks associated with overweight and obesity.

The secondary outcomes of the IMCHN evaluation are identical with the FAS secondary outcomes 2–5.

B. Evaluation Project Phases

The evaluation project is conducted in two main phases; (1) baseline study, and (2) the evaluation study. This report presents the results of the baseline study and hence marks the completion of Phase 1.

Phase 1 includes two main components: The implementation and analysis of (a) the household listing survey and (b) the farm household baseline survey. IFPRI conducted the household listing survey in March–April 2018 followed by the farm household baseline survey in April–May 2018. The findings of both surveys are summarized in this baseline report. The results of the listing survey analysis serves to inform USAID about farm households' reach, participation, and treatment by FAS and IMCHN, in addition to establishing the sampling frame for the baseline study. The results of the farm household baseline survey analysis determine the baseline indicator values against which FAS and IMCHN will be evaluated in Phase 2.

In addition, IFPRI expects that findings from the farm household baseline survey will also generate new evidence that helps to improve policy and program design and implementation

in terms of better leveraging agriculture-health-nutrition linkages in Upper Egypt.[3] The novelty of the evidence comes through two major contributions: First, the farm household survey is the most comprehensive dataset on agriculture and farm household characteristics in Egypt to date, which allows for linking farming with household and individual characteristics and wellbeing, including expenditures and health and nutrition outcomes. Second, little evidence exists on how agriculture can better be leveraged to improve nutrition outcomes at the global level as well as for Egypt. As such, the findings from the farm household baseline survey can make an important contribution to the relevant literature by narrowing the existing knowledge gap on improving nutritional outcomes through nutrition-sensitive interventions in agriculture.

Phase 2 consist of the evaluation study. It will include the implementation of the farm household follow-up survey, analysis of this follow-up survey, and estimation of changes in project outcome variables between the baseline survey and the follow-up survey that plausibly can be linked to the interventions of FAS and IMCHN. IFPRI will present the findings in the evaluation report that will mark the completion of Phase 2.

C. Description of FAS and IMCHN

Tables 1.1 and 1.2 provide overviews of FAS and IMCHN. The following subsections describe the components of each activity that are relevant for this evaluation project.

Table 1.1. FAS project overview

Project name	*Feed the Future Egypt Food-Security and Agribusiness Support*
Implementer (primary)	*Cultivating New Frontiers in Agriculture (as part of the Volunteers for Economic Growth Alliance)*
Cooperative agreement no.	*263-A-15-00022*
Total estimated ceiling of the evaluated project	*US$23 million*
Life of project	*July 2015–June 2020*
Active geographic regions	*Rural areas in seven Upper Egypt governorates (Aswan, Assiut, Beni Suef, Luxor, Menya, Qena, Sohag)*
Development objectives	*Project goal: To increase the income of 14,000 Upper Egypt smallholder farmers, enhance food security of farm households, and improve the nutritional status of women and young children.* *Project components: (1) improved on-farm production; (2) more efficient postharvest processes; (3) improved marketing of agriculture crops and products; and (4) improved nutritional status, especially for women and children.*
USAID office	*USAID/Egypt*

Source: VEGA (2015a); VEGA (2016).

[3] In the rest of the report, we use the abbreviation "IFPRI" to refer to the IFPRI researcher team working on the FAS-IMCHN evaluation study.

Table 1.2. IMCHN project overview

Project name	*Improving Maternal and Child Health and Nutrition Services*
Implementer	*Maternal and Child Survival Program partners, led by Save the Children*
Cooperative agreement no.	*AID-OAA-A-14-00028*
Total estimated ceiling of the evaluated project	*US$5.9 million*
Life of project	*April 2016–March 2018 (recently extended to June 2019)*
Active geographic regions	*Phase II implementation at scale: all Lower and Upper Egypt governorates, and five border governorates*
Development objectives	*Project goal: To end preventable child and maternal deaths within a generation. Project objectives:* *1. To develop a national strategy for Egypt's community health workers that reflects the Family Health Package of the Ministry of Health and Population (MOHP) and will support MOHP in reaching the targets of the Sustainable Development Goals.* *2. To develop a national training system for the Raedat Refiat program and implement it at scale in all 23 governorates of Egypt.*
USAID office	*USAID/Egypt*

Source: Jhpiego et al. (2017).

Food-Security and Agribusiness Support Project

FAS is one of USAID/Egypt's core agricultural activities, supported by the US government's FtF initiative (USAID 2018). FAS is implemented by Cultivating New Frontiers in Agriculture (CNFA) under USAID/Egypt's Agribusiness for Rural Development and Increasing Incomes (ARDII) program. FAS is a five-year project that started on July 1, 2015. It uses a market-driven approach to increase agriculture-related income of smallholder farmers in Upper Egypt through strengthening sustainable horticulture value chains for domestic and export markets (USAID 2018).

Project Objectives, Targets, and Target Population

The Project Description (VEGA 2015a) and Year-1 and Year-2 Work Plan (VEGA 2015b, 2016) define the main project parameters[4].

The project objectives of FAS are:

- To increase the income of 14,000 Upper Egypt smallholder farmers,
- To enhance food security of farm households, and
- To improve the nutritional status of women and young children.

To achieve these objectives over the project lifetime, FAS has four project components:

1) Improved on-farm production

[4] The project objectives have been changed in October 2018. Yet, these changes can only be reflected in future IFPRI activities, since this is post the design of the evaluation project, and the implementation of the baseline surveys. To date (17 January 2019), IFPRI has not been officially informed of the changes in FAS project and did not receive any documents describing those changes.

2) More-efficient postharvest processes
3) Improved marketing of agriculture crops and products
4) Improved nutritional status, especially for women and children

The project targets include (among others):

- A 12 percent annualized increase in household income in net present value (≈ US$380 per household per year) for over 14,000 horticulture-based smallholder farmers,
- Up to 50 percent of increased yields of selected horticulture crops, and
- Upwards of 36,000 farm families benefiting from nutrition-sensitive messaging.

Increasing household income of smallholder farmers is FAS's primary project objective, while other goals and targets are intermediary or subordinate to that. The main target population is farm households that cultivate vegetables, herbs and spices, or fruits at small scale and sell the products for income generation. Smallholder farmers are defined as farmers with a farm size of 10 feddans (1 feddan = 0.42 hectare = 1.038 acre) or less per household (CNFA 2016). To reach the target population, FAS works through formalized farmer associations and farmer groups from agricultural cooperatives.[5] FAS's intervention areas comprise rural communities (villages) in seven Upper Egypt governorates (Aswan, Assiut, Beni Suef, Luxor, Menya, Qena, and Sohag).

FAS works with more farmer associations than farmer groups from agricultural cooperatives. For the ease of readability, the term *farmer groups from agricultural cooperatives* will be omitted in the rest of this report; the term *associations* will refer to both farmer associations and farmer groups from agricultural cooperatives.

Project Activities and Implementation

To realize the project targets, FAS implements various complementary activities under each project component that, at least for the agriculture-related project components, are often specific to the needs of the farmers within the association (VEGA 2015a, 2016). Because the project adopts a value-chain development approach, FAS selects the value chains to be promoted based on the interest and capacity of the farmers to produce a specific horticultural crop and the demand of potential buyers (processors, exporters, and domestic wholesalers) for this crop, in addition to logistical considerations of project implementation. For enrolling associations and their farmers into the project, FAS assesses the capacities of potential associations and surveys farmers about their agricultural assets, experiences, and production and marketing practices, using predefined selection criteria. To reach 14,000 beneficiary farmers over the project lifetime, FAS is rolled out gradually. By the end of the second project

[5] Farmer associations are registered with the Ministry of Social Solidarity, and agricultural cooperatives are registered with the Ministry of Agriculture and Land Reclamation. Farmers' membership in an association is voluntary, usually subject to fees, and based on the specific purpose of this association (e.g., for promotion of horticultural production). A cooperative has a general agricultural development purpose, and all farmers within the cooperative's catchment area are formal members of that cooperative free of charge. Some farmers of a cooperative may form a farmer group for pursuing common interest. Farmers can be members of both a farmer association and agricultural cooperative.

year in June 2017, 2,000 farmers should have been treated by FAS (for at least one full agricultural season). Then, an additional 4,000 farmers per year should be treated (for at least one full agricultural season) until June of each following project year.

Most (marketable) vegetables and herbs and spices are grown during a particular agricultural season and mostly in only distinct governorates and distinct areas within a governorate, because of different heat tolerance and soil quality. All of the considered fruits are perennial and are harvested only once per year. This provides a natural selection of the value chains for FAS interventions by season and governorate. Because of the targeted horticultural crops and their production requirements, the main season for FAS interventions is the winter season. In addition, the profit margins in targeted export markets—especially in Europe—tend to be much larger during the winter, when domestic production in the main export countries (in Europe) is low.

A key FAS activity to achieve farm income growth among the project beneficiaries, and hence to achieve the main project target, is to contractually link farmers to buyers of horticultural products through a forward contract. FAS's contributions are to identify a buyer of the promoted horticultural product, to select farmers that agree to produce this crop and deliver the product, and to facilitate signing of the forward contract between the buyer and the farmers that is profitable to the farmers. A contract may be signed by either an individual farmer or—more commonly—a representative of an association on behalf of the committing farmers. The contract guarantees farmers to sell an agreed minimum quantity of the promoted horticultural produce with a minimum quality grade to a buyer at a predefined price. Forward contracts are signed on a seasonal basis—usually (shortly) before the start of planting of the respective season (but sometimes even thereafter)—and refer only to the harvest at the end of that season. Throughout the season, FAS conducts a series of trainings to ensure farmers comply with contract parameters, produce according to required quality standards, and increase horticultural yields. The training sessions can also be attended by farmers who did not commit to a contract. For (perennial) fruit value-chain promotion, forward contracts will not be facilitated by FAS, and the interventions are mainly limited to farmer trainings.

FAS expects that food and nutrition security among the beneficiary farm households increases as a result of higher household income and increased own consumption of the promoted vegetables and fruits, as typically only a share of the harvested products can be sold under a forward contract, given strict quality standards. Beyond improving the availability and access to vegetables and fruits, FAS plans to increase the utilization of nutritious foods and improve the nutritional status of children and women by distributing nutrition-relevant messages to at least 36,000 women from farming families through the Short Message Service (SMS) (VEGA 2015a, 2016). This campaign should be complemented by developing a basic agri-nutrition resource toolkit as a manual for community health workers and agricultural extension workers, to be completed by the second project year in June 2017.

Improving Maternal and Child Health and Nutrition Services Project

The Improving Maternal and Child Health and Nutrition Services project is an Egypt-wide project under USAID's global Maternal and Child Survival Program (MCSP) and hence shares its ultimate goal. The goal is to end preventable child and maternal deaths within a generation. The project started in April 2016 and had a planned lifetime of three years (which was recently extended until June 2019). IMCHN includes two phases, but only the second phase is of relevance for this evaluation project (IFPRI 2017b). The project objective of the first phase is to provide technical assistance to the Egypt Ministry of Health and Population (MOHP) to develop a national strategy for Egypt's community health workers that reflects MOHP's Family Health Package (that is, a comprehensive package of integrated healthcare services for all members of a family) and will support MOHP in reaching the targets of the Sustainable Development Goals. The project objective of the second phase is to provide technical assistance to MOHP to develop a national training system for its Raedat Refiat program and to implement it at scale in 23 governorates of Upper Egypt and Lower Egypt (Jhpiego et al. 2017), including in all seven governorates that are also targeted by FAS. The newly developed Raedat Refiat training curriculum includes a comprehensive list of health and nutrition topics, especially related to maternal and child health and nutrition.

Training Cascade

To train all Raedat Refiat (approximately 12,000 individuals nationwide) using the new curriculum, a four-stage training system is adopted: First, MCSP, together with MOHP, selects 60 MOHP staff for training as Master Trainers and trains them, starting in April 2017. Second, MCSP and MOHP select Lead Trainers from each governorate, and MCSP staff and the Master Trainers conduct trainings in the governorates to develop the Lead Trainers. Third, the Lead Trainers train the supervisors and managers of the Raedat Refiat (approximately 1,300 individuals countrywide), starting in July 2017. Fourth, the Raedat Refiat supervisors and managers—with coaching and support from the Lead Trainers—train the Raedat Refiat in classroom and during their daily routine, starting in October 2017 (Jhpiego et al. 2017). The training should have been completed within a period of 12 months, and the newly acquired knowledge should be communicated to the visited families immediately.

Raedat Refiat Outreach

The Raedat Refiat ("village pioneers") program is an essential part of the public sector's primary healthcare system in Egypt—especially in rural areas. Raedat Refiat are "frontline" community health workers who reach out to families in need of basic healthcare within the catchment area of the primary health unit where they are employed (under a MOHP contract). Raedat Refiat are almost exclusively women (98.9 percent) and are recruited from local communities. Their primary responsibility is to visit women and their families at home and refer women with health concerns or who want to space their children, to the primary healthcare units where they can obtain family planning, reproductive health, and primary healthcare services. Another important responsibility is to promote family planning and improved health

behaviors regarding reproductive health, ante- and postnatal care, and child care and nutrition during their home visits (Jhpiego et al. 2017). The Raedat Refiat program serves households that are located mainly (though not exclusively) in communities that are officially classified as rural communities (Abdelmegeid et al. 2015). As the program is designed, each Raeda Refia is responsible for an average of 500 women in reproductive age and their families. She is expected to conduct 160 home visits per month (or eight home visits per day), so that each of the 500 families for whom she is responsible is visited once per quarter (Jhpiego et al. 2017).

D. Evaluation Design and Implementation

This section starts by describing the evaluation methods that IFPRI considered implementing to conduct a rigorous, experimental impact evaluation. Yet, as will be explained hereunder, implementation challenges forced IFPRI to pursue a less rigorous, plausibility design.

Evaluation Limitations and Challenges

The key feature of an impact evaluation is that it allows to attribute observed changes in an outcome variable to a particular intervention; in other words, it allows to answer *cause-and-effect questions*. An impact evaluation provides the strongest evidence of the causal effects of a project. The following section explains how IFPRI tried to apply various impact evaluation designs according to the (changing) FAS project design and why IFPRI finally had to resort to a matching design.

Methodological Considerations

Methodologically, an impact evaluation requires a carefully designed identification strategy and the establishment of a valid *counterfactual* to the group of project participants. An identification strategy precisely describes how the expected changes in the outcome link to the planed project intervention—that is, the *treatment*. Hence, an identification strategy helps to plausibly explain the likely pathways through which the observed changes in the outcome occur.

To be able to estimate the causal effect on an outcome, any impact evaluation method chosen must estimate the so-called counterfactual: that is, what the outcome would have been for project participants if they had not participated in the project. In practice, impact evaluation requires that the evaluation team find a group of nonparticipants to estimate what would have happened to the project participants without the project, then make comparisons with the *treatment group* that has received the project intervention (Gertler et al. 2017). The methodological challenge is to find a method for constructing a proxy for these counterfactual outcomes from information on nonparticipants of the project—that is, the *comparison group*. It requires controlling for the effects of confounding economic and contextual factors that make project participants systematically different from an average nonparticipant. Examples of these confounding factors that can affect project impact estimates and flaw causality claims include

relative income levels, information asymmetry, and differences in risk aversion, skill levels, and demographics. Impact estimates that imperfectly control for these confounders suffer from *selection bias*.

There is broad consensus among impact evaluation experts that the preferred technique for removing selection bias is to conduct an *experiment* designed as a *randomized controlled trial (RCT)* that randomly assigns access to the project for the purpose of the evaluation. Heckman and Smith (1999) and Heckman and Todd (1997) show how random assignment to treatment regimes eliminates selection bias and creates a rigorous impact evaluation. The intuition is that if access to the project is random within a group of similarly eligible households, treatment status cannot be correlated with the outcomes. As a result, any observed differences in an outcome over time between the treatment group and the experimental comparison group—that is the *control group*—must be a result of the project. An RCT approach can be well justified ethically and implemented transparently and most fairly among the potential beneficiary population in a project that is phased in over time and when the precise benefits of the project are not well known—as in the case of FAS.

RCT Design 1: Oversubscription Method with Randomized Order of Phase-In

Because of the methodological rigor of an RCT, and after thorough discussions with USAID/Egypt staff on the feasibility of the implementation, IFPRI proposed an RCT approach for the impact evaluation of FAS in the Technical Application for the EIBC project grant that was awarded by USAID/Egypt in June 2015. Based on several in-depth discussions with FAS throughout the first 15 months of the project lifetime, IFPRI specified the proposed RCT approach in the first version of the EIBC Statement of Work that was submitted to USAID/Egypt in October 2016 (IFPRI 2016). At that time, FAS was convinced and repeatedly confirmed to IFPRI that there are many more horticultural farm households that are eligible and willing to participate in the project than FAS can practically enroll in the first large-scale rollout phase. The first large-scale rollout phase was planned for the winter season 2017–18 (FAS recorded only about 300 farmers as project participants during the winter season 2016–17, and the work was considered as not representative of the package of interventions that farmers are expected to receive in the following rollout phases).

Based on this information, IFPRI developed an innovative RCT evaluation design that combines an *oversubscription* method with a *randomized order of phase-in* (Duflo, Glennerster, and Kremer 2007). The fact that FAS is implemented over time and the reported condition that the demand of eligible farmers in the partnering associations for participation in the project vastly exceeds the project enrollment capacity during the first large-scale rollout phase (due to limited, but growing, project resources) provide a natural opportunity for introducing randomization. Randomization provides the fairest way of determining the farmers who first receive the intervention. The wait-listed farmers who receive the intervention later (in a following implementation phase) would serve as the comparison group. Unlike in the pure oversubscription method, all individuals would receive the intervention in the randomized

phase-in method proposed by IFPRI. Hence, this method allows for randomization in contexts where it is not acceptable for individuals to receive no support.

The practical implementation of the evaluation design was proposed as follows: FAS agreed to provide lists of willing and eligible, new farmers from partnering associations that are obtained from the FAS association and farmer assessment surveys. FAS and IFPRI agreed to implement the randomization through public lotteries in the partnering associations to ensure the fairest and most transparent way of determining the farmers who will be enrolled in the winter season 2017–18 and who will be enrolled in the winter season 2018–19. IFPRI planned to conduct the baseline survey in fall 2017 shortly before the start of planting for the winter season 2018–19, the first follow-up survey after the harvest of the 2017–18 winter season in spring 2018, and the second follow-up survey after the harvest of the 2018–19 winter season in spring 2019.

IFPRI proposed to estimate the impact of FAS using the data from, first, the baseline survey and first follow-up survey, and second, from the baseline survey and second follow-up survey. Note that at the first follow-up survey, the wait-listed households had not yet received the FAS intervention. Thus, the first impact analysis would provide the best estimate of the impact of the FAS project interventions on the outcomes of interest. At the second follow-up survey, the impact estimates would reflect the differential impact of different lengths of exposure to FAS interventions.

RCT Design 2: Randomized Promotion Method

During a series of meetings with FAS and a field trip to FAS partner associations in early November 2017, FAS revealed to IFPRI that, contrary to original statements, there were far fewer associations and farmers interested in participating in the project than the program could enroll and that, in fact, FAS faced problems in identifying sufficient eligible and willing farmers to come even near to the targeted number of farmers per season to be enrolled into the project. Therefore, FAS would undertake major efforts to enroll all interested (and qualified) farmers during the following seasons. Given these newly revealed circumstances, IFPRI and FAS concluded that an oversubscription-based RCT design is not feasible. During these meetings, FAS also clarified for the first time that enrollment into the project (and dropout of the project) is season- and crop-specific. It is possible—and perhaps even most likely—that farmers would be participants of FAS in one season but not in the following seasons. This is because the interventions are specific to the production and harvest of particular crops in particular seasons, and the selected crops to be promoted by FAS tend to change by season depending on the identification of potential buyers of the harvest and their demand. Moreover, farmers were considered to be reluctant to commit to FAS for more than one season.

After agreeing with FAS, IFPRI proposed a new RCT design in the revised version of the Statement of Work that was submitted to USAID/Egypt in early February 2017. The proposed RCT design uses a *randomized promotion*—or *encouragement*—method (Duflo, Glennerster, and Kremer 2007). It utilizes the fact that FAS is challenged by the motivation of (qualified) farmers to consider participation in the project and assumes that an intensive, extra promotion campaign can substantially boost project take-up. IFPRI proposed to add another layer of

encouragement to potentially interested farmers, on top of the normal project promotion strategy by FAS. IFPRI planned to randomly select some eligible farmers to receive extra project information and intensive promotion. The proposed promotion method would be particularly beneficial to FAS, as it increases the project beneficiary population at no cost to the implementers.

Keeping the original timeline for the implementations of the surveys, IFPRI proposed to conduct the baseline survey before rolling out the extra promotion campaign in fall 2017, the first follow-up survey after the harvest of the winter season 2017–18, and the second follow-up survey one year later—after the harvest of the winter season 2018–19. IFPRI planned to estimate project impact by using the data form the baseline and the first follow-up surveys. The group of encouraged farm households would serve as the treatment group, and the group of nonpromoted farm households as the comparison group. Data from the second follow-up survey in combination with data from the baseline and first follow-up survey would have been used to examine the sustained project effects.

Plausibility Design: Matching

In the final version of the Statement of Work (see Appendix I) approved by USAID in March 2017, IFPRI specified several critical conditions that needed to be met for the successful implementation of the proposed RCT design with randomized promotion (IFPRI 2017a). These conditions were not met, and IFPRI had to fall back to the least desirable impact evaluation method as the last feasible option remaining (IFPRI 2017b). IFPRI concluded that an experimental design for the impact evaluation of FAS is not feasible and proposed to adopt a *plausibility* (or *probability*) *design* that is of less methodological rigor in detecting project impact. In the Implementation Plan submitted to USAID/Egypt in November 2017 (see Appendix II), IFPRI proposed to use a *quasi-experimental method*, precisely *matching*, to estimate the project impact of FAS. Additionally, the term *evaluation* instead of *impact evaluation* has been used to refer to project evaluation.

Evaluation Design

As mentioned, matching is the evaluation method to be implemented for this project. Matching methods will be implemented using the follow-up survey data, which will be collected in the second phase of the evaluation project. Though, it should be mentioned here that even this design (as well as any other potential impact evaluation design) can be compromised by too few observations in the treatment group and low-intensity of the treatment or lack of treatment.

For the survey sample, IFPRI agreed with USAID/Egypt (and FAS) that the following key parameters—determined by the project properties of FAS—define the evaluation design and hence the baseline survey sampling (IFPRI 2017b):

1) The evaluation focuses on assessing the project effects for vegetable and herb and spice interventions.

2) The observation periods of the evaluation are the summer 2017, winter seasons 2017–18, summer 2018 and winter 2018–19.[6]

3) The evaluation assesses the project effects for new FAS farm households that are farm households who were enrolled to the summer 2017 and winter 2017–18 seasons for the first time.

4) A farm household is considered part of the treatment group of the evaluation if the farmer signed an individual FAS-facilitated forward contract with a buyer or committed to a FAS-facilitated forward contract between the representing association and a buyer (between July and November 2017). A facilitated forward contract is the single and most tangible treatment that clearly differentiates FAS farm households from non-FAS farm households before the start of the actual project interventions. It can also be expected to be the single intervention with the highest potential for farm household income increases. Moreover, signing/committing to a contract should trigger a package of FAS interventions designed to comply with and benefit from this commitment.

Sample Selection

For both the baseline and follow-up surveys, the household sampling procedure differs for the treatment group and the comparison group of the evaluation (IFPRI 2017a). "Treated" farmers are the farmers that committed to or signed a FAS-facilitated forward contract for the winter season 2017–18 for the first time are provided by the final *FAS farmer list.*[7] To construct a valid counterfactual for this treatment group, non-FAS, horticulture-based smallholder farm households are randomly selected within the villages where the FAS partner associations are located. These comparison households are identified using a *random walk* method.

To verify FAS farmers and to randomly select the comparison, a *household listing survey* is implemented, prior to the *farm household survey*.

E. Baseline Study Description

The *household listing survey* was conducted in villages with FAS associations in six Upper Egypt governorates (Assiut, Beni Suef, Luxor, Menya, Qena, and Sohag) in March–April 2018. IFPRI did not receive official approval to conduct a survey in the seventh governorate where FAS works (Aswan). The *farm household baseline survey* was implemented shortly after the household listing survey, interviewing the confirmed FAS farm households and randomly selected non-FAS farm households.

[6] The original design which was included in the statement of work covered only the winter season. Yet, IFPRI decided to include the summer seasons as well, in order to cover more farmers and to detect the seasonal differences in farm activities, for summer and winter.

[7] IFPRI can modify the definition of a treated farmer, based on the FAS project developments, and implementation changes.

Sample Size Calculation

Sample size requirements of the farm household baseline surveys were calculated for the primary outcome of the FAS evaluation—that is, total household expenditure per capita (IFPRI 2017a). Sample size calculations are based on the estimated (immediate) impact of FAS over the 2017–18 winter season, using the differences expected to be found between farm households who committed to or signed a FAS-facilitated forward contract and those who did not. Because of challenges in obtaining consistent and credible information on FAS farmers (see Table 3.1) for the winter season 2017–18 and the number of newly participating farmers in these associations (at the time of the sample design), IFPRI had to make assumptions on these parameters, which were informed by FAS project targets and oral communications with FAS staff. The minimum sample size required for the impact evaluation was calculated assuming that FAS works with 55 associations and with 36 newly enrolled farm households in each of these associations in the winter season 2017–18.

The sample size was calculated for *two scenarios*: The first scenario assumed that five associations and six farm households per association refuse to participate in the study, cannot be reached, or drop out from the project after the baseline survey. This leaves 50 partner associations with 30 farm households each. The second scenario marks a situation where FAS continues to face enrollment difficulties. This low-participation scenario assumes 40 partner associations with 20 participating farm households each. Further, the sample size calculation under both scenarios was based on the following parameters: 0.05 probability of a type I error and a statistical power of 0.80. The method used for calculating sample size assumes an RCT design; equivalent methods for calculating sample size for a matching analysis do not exist. The sample size (estimated for a RCT design) was adjusted for intracluster correlation.

Assuming that an equal number of households in the comparison group is needed to detect the project impact and assuming that 20 percent of the households in the comparison group will enroll in FAS after the first follow-up survey and before the second follow-up survey, IFPRI planned to oversample the households for the comparison group at baseline. For each FAS household, 1.2 non-FAS households (rounded) from the same village should be surveyed.

Under the *first scenario*, the estimated minimum sample size at baseline is 1,500 FAS farm households in the treatment group and 1,800 non-FAS farm households in the comparison group (adding up a total of 3,300 farm households). Under the *second scenario*, the estimated minimum sample size at baseline is 800 FAS farm households and 960 non-FAS farm households (adding up to a total of 1,760 farm households). IFPRI targeted the baseline survey sample size of the first scenario—or as close as possible to it, because this sample size provides the necessary statistical power for the analysis—allowing for the detection of relatively small project effects. IFPRI powered the analysis to be able to detect project-caused changes in per capita household expenditure of 7.5 percent or more per year under the first scenario and 8.7 percent or more per year under the second scenario. These estimated detectable effects are substantially lower than FAS's target of a 12 percent annualized increase in total household expenditure. Thus, IFPRI took into account that FAS may fall short of its target during the observation period of the evaluation project.

Data Collection, Cleaning, and Management

IFPRI contracted El-Zanaty and Associates to conduct the Household Listing Survey and the Farm Household Baseline Survey. The following section summarizes key information from El-Zanaty and Associates field trip report.

El-Zanaty and Associates started the recruitment of field staff in October 2017 with a total of 101 candidates. Subsequently, 75 candidates were invited for training and only those who excelled during the training were pre-selected. For the Household Listing Survey, 15 enumerators with experience in listing procedures were trained, and 10 selected for data collection. For the Farm Household Survey, 40 enumerators and 10 supervisors were selected and assigned to 10 different teams. For the collection of anthropometry data (within the Farm Household Survey), 26 technicians were trained, and 10 were finally selected. The training for the listers lasted 3 days, whereas training for the Farm Household Baseline and anthropometry data collectors lasted 2 weeks each. Given the delays in data collection explained later in the report, El-Zanaty and Associates organized refreshment training sessions in March 2018 to assure that all teams were well prepared for fieldwork.

Data collection for the Household Listing Survey took place from March 29th to April 2nd, 2018, and from April 9th to May 8th, 2018 for the Farm Household Baseline Survey. The data collection and cleaning involved the following key steps and activities:

- Training for supervisors and enumerators: supervisors and enumerators were trained on the paper-based and the CAPI version of the questionnaire. Training sessions involved lectures, role-play, and practice involving both the paper and CAPI versions of the questionnaire. As part of the trainings, a two-day field practice was organized. The supervisors were also trained to monitor and report progress and problems to El-Zanaty.

- Training and standardization of the anthropometry team: all anthropometrists received lectures, equipment demonstrations and practical training. Practice involved the measurement of 13 children age 0 to 59 months plus their mothers. In addition, a one-day training at a nursery school was organized where 50 children (approx. 6 per team) were measured. Accuracy and precision of all teams was analyzed by El-Zanaty and Associates and the assessments were used to select 20 anthropometrists (organized in 10 teams) for data collection.

- Organization of Household Listing Survey teams: teams were divided across the 6 governorates, where the study took place. Each team had one supervisor who was responsible for organizing and planning the day-to-day activities for each team. The supervisor was also responsible for contacting the head of each association/cooperative, which was a key step for locating farmers based on the list that FAS had provided. In addition, supervisors were responsible for reporting back to the El-Zanaty team in Cairo. Enumerators were responsible for applying the questionnaire to the FAS households and for selecting the comparison group based on the pre-established random walk procedure (see Section II).

- Organization of Farm Household Baseline teams: the fieldwork was divided among 8 teams, each of which had one supervisor, two female enumerators, two male enumerators and two anthropometrists.[8] The two female interviewers administered the sections of the questionnaire that were designed to be answered by mothers, caretakers or women in general (see Appendix IV); the two male enumerators administered the sections to be answered by the head of the household or the main farmer. The anthropometry team was composed of one person responsible for measuring children and women, and for the adequate functioning of the equipment; and one assistant, who recorded the all measurement. The supervisors were responsible for sending information to the central office of El-Zanaty and Associates (via Dropbox) and for checking any potential problems during data collection.

- Administration of the Household Listing Survey questionnaire: to implement the Household Listing Survey, enumerators identified and contacted each association/cooperative included in the list received from FAS. The heads of associations/cooperatives were informed about the study and asked to provide telephone numbers and location of each farmers in the list. Once this information was available to the enumerators, an appointment was made with the farmer. For those cases for which the information could not be obtained from the association/cooperative, enumerators looked for farmers directly by asking their neighbors in the village. Once the farmers in the FAS lists were located (not of all them could be found, see Table 2.8), the enumerators started interviews among FAS farmers and the random-walk procedure to select comparison farmers. On average, interviews lasted 10-15 minutes.

- Administration of the Farm Household Baseline Survey: the first step was to assign each team to a region. Three teams were assigned to Beni Suef, one team was assigned to Menya, one team to Sohag (then moved on to Menya after completing Sohag), two teams to Sohag, and one team to Qena and Luxor. Supervisors contacted the farmers in advance and made an appointment with households to be interviewed (usually the next day). At the end of each day, questionnaires were reviewed, and data was checked. The teams completed on average 10 questionnaires per day.

- Handling of questionnaires: upon the completion of each interview, the enumerator checked the data and transferred the information to a Dropbox folder. At the end of each day, enumerators counted and revised the number of questionnaires completed and reported back to their supervisor. All teams had permanent access to internet that allowed them to transfer the data daily. Teams were also in permanent communication via WhatsApp with El-Zanaty's office in Cairo and IFPRI staff, where questions were addressed, and problems encountered during data collection were discussed. Once the data from all enumerators were shared and uploaded to Dropbox, the supervisors checked and reviewed the data to detect inconsistencies and possible problems with the

[8] Two of the teams selected after the first training in October 2017 were not available any more in April 2018, when the data collection took place.

data. When data collection was completed for a cluster, supervisors "closed" the cluster and transferred the data to the main server at El-Zanaty and Associates.

- Quality control: A short version of the Farm Household Survey questionnaire was developed and programmed in CAPI with key questions to assess the accuracy of the data collected by all teams. 162 households were randomly selected (approx. 7% of the total sample of households) and re-interviewed by two controllers after each cluster was completed. In case of detecting problems or inconsistencies, the supervisor was informed and instructed to call back and/or revisit households to check the information. In 90% of the households interviewed, however, no inconsistencies were found. Also, a technician supervised the collection of anthropometric measurements during fieldwork. This technician was responsible for correcting problems and providing input to anthropometrists when needed. The technician visited a total of 63 households during data collection.

- Data cleaning and management: Data cleaning was conducted in two stages. Standard consistency checks (data set comparisons, ranges, missing information, average values, etc.) were conducted for all variables based on frequency tables. In some cases, households were re-contacted to directly doublecheck potentially inconsistent information. After completing the first stage of data cleaning, the data was transferred to Stata software and delivered to IFPRI. The second stage consisted of reviewing the data following additional standard data cleaning checks. Finally, data were anonymized by removing names and personal information of all households interviewed. Sensitive (non-anonymized) information was stored in an IFPRI-server-based Dropbox Professional folder, which can only be accessed by two members of the research team. The anonymized survey data was used for the analysis underlying this report.

F. Baseline Report Outline

The remainder of the baseline report proceeds as follows. Chapter II presents the implementation of the household listing survey and the results of the listing survey analysis. Chapter III presents the results of the farm household baseline survey analysis. Each chapter is structured identically. Before turning to the results of the survey analyses, the first section of each chapter deals with methodological concerns. The order of the results sections of Chapter III follow the order of the modules in the farm household baseline survey questionnaires. Chapter II and the results sections of Chapter III conclude with a summary of the key findings.

II. HOUSEHOLD LISTING SURVEY IMPLEMENTATION AND ANALYSIS

The household listing survey (see Appendix V) had four purposes:

A. To verify the personal information of the FAS farmers and their household addresses provided by the FAS farmer list and to record the type of FAS-facilitated forward contract the individual FAS farmer has committed to (individually signed or committed to association-based contract) and to collect basic information of project participation;

B. To record Raedat Rifat coverage, i.e. how many and which of the FAS farm households have received visits from Raedat Rifat;

C. To randomly select the comparison households and record their locations; and

D. To assess FAS and IMCHN project reaches based on verification and coverage.

The survey was conducted in villages with FAS associations in six Upper Egypt governorates (Assiut, Beni Suef, Luxor, Menya, Qena, and Sohag). Household identification information—blinded for household allocation to treatment or comparison group—were used to implement the farm household baseline survey.

A. Selection and Verification of FAS Participants

For the design of any evaluation of project effects, the most important and basic information that evaluators need from implementers of the project to be evaluated is who the project beneficiaries are and for how long they have been beneficiaries. Such a listing of beneficiaries is needed to calculate the survey sample size needed to have sufficient statistical power to be able to detect project effects, among other fundamental evaluation design parameters. From the very beginning of the development of the first evaluation design, IFPRI requested that FAS provides lists of newly enrolled farmers by association and season, as soon as they became available.

Table 2.1 provides an overview of the requests for final FAS farmer lists at status quo, limited to the period for developing the last plausibility design. The table shows large inconsistencies in terms of the number of both farmers and associations over time. For example, according to information received by FAS between August 1, 2017, and December 6, 2017, the number of farmers had decreased from 1,948 to 1,066, and the number of associations from 76 to 23 before jumping up to 4,544 farmers and 73 associations by March 1, 2018. This volatility suggests that the lists received were neither final nor complete before and even during most of the winter season 2017–18, which made it impossible for IFPRI to implement a credible baseline survey before this winter season (in addition to delays in receiving official approval for conducting the survey). IFPRI therefore surveyed farm households after the winter season 2017–18 for the first time.

Table 2.1. Requests for final and complete FAS farmer lists

New list	Requested	Reminder sent	Received	Status of list	Reported number of farmers	Reported number of associations
List 1	Mar 14, 2017 (meeting)	Mar 19, 2017 (email) Apr 26, 2017 (email) May 18, 2017 (meeting) Jun 8, 2017 (email) Jun 14, 2017 (meeting) Jun 21, 2017 (email)	Apr 4, 2017	Preliminary, acc. to FAS	584	34
		Jul 18, 2017 (email)	Aug 1, 2017	Final, acc. to FAS; clarification requested by IFPRI	1,948	76
List 2	Oct 2, 2017 (email)		Oct 15, 2017	Preliminary, acc. to FAS	1,225	19
List 3	Nov 13, 2017 (email)	Nov 19, 2017 (email)				
		Dec 4, 2017 (email)	Dec 6, 2017	Final, acc. to FAS; clarification requested by IFPRI	1,066	23
List 4	Dec 6, 2017 (email)		Jan 15, 2018	Final, acc. to FAS	1,790	50
List 5	Feb 27, 2017 (email)		Mar 1, 2018	Final, acc. to FAS	4,544	73

Source: Own representation, based on email and verbal communications.
Note: A list is defined as "new" if the file is different and the presentation of the list was modified.

IFPRI received the final list of FAS farmers on March 1, 2018. It included 4,544 farmers from the six Upper Egypt governorates and Aswan governorate that were enrolled in FAS up to the end of December 2018 (Table 2.1). IFPRI dropped all 566 farmers in Aswan (12.5 percent) from the sample. When inspecting the data, IFPRI detected duplicates and inconsistencies in Arabic spellings of names, associations, villages, and districts (which is critical for sample selection because there was no unique identifier assigned to farmers). IFPRI removed obvious duplicates and harmonized spellings that resulted in 285 farmers (6.3 percent) removed from the sample. As a second step of data check and cleaning, IFPRI requested that FAS confirmed remaining cases of possible duplicates and spelling inconsistencies and cases of possibly incorrect recording of project participation during multiple seasons. FAS instructed IFPRI to drop another 360 farmers (7.9 percent).

Out of these 3,333 FAS farmers, 1,057 farmers (31.7 percent) were newly enrolled for the winter season 2017–18; 2,211 farmers (66.3 percent) were newly enrolled for the summer season 2017; and 65 farmers (1.9 percent) were already enrolled for the winter season 2016–17. IFPRI applied a stratified sampling approach to select the sample of farmers to be interviewed in the household listing survey following the key parameters of the evaluation project (Section I.D):

6) The 65 farmers enrolled in the winter season 2016–17 were dropped. Additional checks confirmed that there were no other cases of farmers, who participated in FAS in any previous season. Because of the already low number of FAS farmers, IFPRI decided to include newly enrolled farmers for both the summer season 2017 and the winter season 2017–18.[9]

7) Fruit farmers, who all were enrolled for the summer season 2017, were dropped (see Section I.D). This reduces the sample by 313 farmers (189 producing table grapes and 124 producing pomegranates; 9.6 percent).

8) There is a large heterogeneity in the number of FAS farmers per association, ranging from one farmer to more than 400 farmers. We expect that the FAS interventions in associations with very few participants are considerably different (that is, likely less frequent and less intense) than those received in associations with a substantial number of participants. Moreover, unlike for vegetables, FAS supports value-chain development for a large variety of different herbs and spices and often more than one herb or spice within one association. To focus on the main value chains and FAS associations with a substantial number of participating farmers, IFPRI defined six value-chain clusters (green beans, onions, tomatoes, sweet potatoes, geraniums, and other herbs and spices). Value-chain clusters with fewer than 20 farmers per association were excluded from the study. This reduced the sample by 199 farmers (6.0 percent). The sample now includes 2,752 farmers from 34 (major) FAS associations (Table 2.3). Each of these associations belongs to only one value-chain cluster.

[9] Two additional FAS farmers, newly enrolled in the summer season 2017, were dropped, because their association was missing in the list and could not be identified.

9) Finally, in large strata, FAS farmers were randomly selected to be interviewed for the household listing survey, while in small strata all FAS farmers were selected. A stratum is defined by a group of farmers that are all from one association, belong to the same value-chain cluster, and were enrolled in the same season. Considering that some associations have many FAS farmers from more than one village (with potentially different agricultural and infrastructural conditions), a stratum was divided into multiple strata based on village boundaries. The final sample includes farmers from 52 strata. In large strata, 40 farmers were randomly selected to be interviewed for the household listing survey and the farm household baseline survey. Additionally, up to 10 farmers per stratum were randomly selected to be interviewed for the household listing survey and short-listed for the farm household baseline interview, if the selected farmers are unavailable at the time of the baseline survey or refuse to participate. The target sample size of the household listing survey for the treatment group is 1,918 FAS farm households, with 1,681 households selected and 237 households short-listed for the baseline survey interview (Tables 2.4 and 2.5). The targeted sample size for the comparison group is 2,111 farm households, equivalent to 110.1 percent of the targeted treatment households.

Table 2.2. Number of listed FAS farmers by promoted vegetable and herb and spice value chain and agricultural season

	Summer season 2017	Winter season 2017–18	Total
Vegetables			
Green beans	568	353	921
Onions	399	512	911
Tomatoes	0	61	61
Sweet potatoes	66	0	66
Celery	2	0	2
Herbs and spices			
Fennel	107	131	238
Basil	349	0	349
Marjoram	163	0	163
Thyme	12	0	12
Anise	42	0	42
Parsley	34	0	34
Cilantro	7	0	7
Dill	8	0	8
Cumin	1	0	1
Black cumin	1	0	1
Pepper	6	0	6
Mint	21	0	21
Chamomile	7	0	7
Calendula	6	0	6
Geranium	97	0	97
Total	1,896	1,057	2,953

Source: Own calculation, based on FAS farmer list.

Table 2.3. Number of listed FAS farmers by promoted value-chain clusters and agricultural season

	Summer season 2017	Winter season 2017–18	Total
Green beans	561	341	902
Onions	389	498	887
Tomatoes	0	52	52
Sweet potatoes	62	0	62
Geranium	97	0	97
Other herbs and spices	644	108	752
Total	1,753	999	2,752

Source: Own calculation, based on FAS farmer list.

Table 2.4. Target sample size of household listing survey for treatment group by value-chain cluster and agricultural season

	Summer season 2017		Winter season 2017–18		Total	
	Selected	Short-listed	Selected	Short-listed	Selected	Short-listed
Green beans	334	49	213	40	547	89
Onions	211	16	362	47	573	63
Tomatoes	0	0	40	5	40	5
Sweet potatoes	40	10	0	0	40	10
Geranium	40	10	0	0	40	10
Other herbs and spices, of which:	354	50	87	10	441	60
Fennel	66	2	87	10	153	12
Basil	179	27	0	0	179	27
Marjoram	76	11	0	0	76	11
Anise	23	0	0	0	23	0
Parsley	7	1	0	0	7	1
Black cumin	1	0	0	0	1	0
Mint	2	6	0	0	2	6
Chamomile	0	3	0	0	0	3
Total	979	135	702	102	1,681	237

Source: Own calculation, based on FAS farmer list.

Table 2.5. Target sample size of household listing survey for treatment group by governorate

	FAS farmers			FAS associations
	Selected	Short-listed	Total	
Beni Suef	508	97	605	11
Menya	229	30	259	6
Assiut	40	10	50	1
Sohag	752	85	837	11
Qena	92	10	102	3
Luxor	60	5	65	2
Total	1,681	237	1,918	34

Source: Own calculation, based on FAS farmer list.

B. Raedat Refiat Program Coverage and IMCHN Project Reach

The selection of FAS farm households and their comparison households does not influence the expected coverage of IMCHN beneficiary households in the sample, because none of the criteria for selecting the farm households is a (obvious) criterion for selection of IMCHN beneficiary households.

Since IFPRI does not have access to the log books of the RRs, IFPRI developed the survey sampling for the IMCHN evaluation based on information from the project's Implementation Plan (Jhpiego et al. 2017) and different survey data sources of the Egypt Central Agency for Public Mobilization and Statistics (CAPMAS) and RRs distribution per governorate by MOHP. Given that the project target of IMCHN is to train all Raedat Refiat in all governorates in Upper Egypt (as part of a national plan to train RRs in Lower Egypt and border governorates as well), IFPRI performed the following estimation of the coverage of the Raedat Refiat program and the project reach of RRs at the governorate level.

Table 2.6 shows population estimates by governorate in total and for rural and urban areas that are available from CAPMAS's online census database (CAPMAS 2018) and are derived from the latest Egypt Population and Housing Census, conducted in 2017. The database also reports the number of households by governorate in total. To estimate the number of households by rural and urban areas per governorate, IFPRI applied proportional rates calculated by CAPMAS based on the previous Egypt Population and Housing Census, conducted in 2006. These proportions were used in the sample design for the last Demographic and Health Survey (DHS), conducted in 2014, and are available from the DHS report (MOHP et al. 2015).

Considering the focus of the Raedat Refiat program on nutrition and health messages to women of reproductive age and women with young children, IFPRI estimated the number of households with women age 15–49 years and households with women in this age range and young children age 0–59 months. The estimates are shown in Table 2.7. They are derived from the estimates in Table 2.6 and by applying estimated proportions derived from the Egypt Household Income, Expenditure, and Consumption Survey (HIECS), conducted in 2010–11. The HIECS sample design is based on the 2006 census.

Finally, IFPRI estimated the coverage of the Raedat Refiat program across the target households and the probability that a randomly selected target household has been visited by a Raeda Refia. For a realistic estimation, IFPRI used the number of the permanent Raedat Refiat workforce that was on duty in 2017. Table 2.8 shows the number of Raedat Refiat for the six Upper Egypt governorates. It also shows the target households per Raeda Refia and the Raedat Refiat program coverage for both households with women of reproductive age only and households with women of reproductive age and with young children, at the governorate level, if the RRs coverage is random across the governorate. These estimates mark a range of the intended targeting of the different types of messages that the Raedat Refiat are expected to convey. Moreover, Table 2.8 provides the estimates for the total target population—that is, households in urban and rural areas—and for target households in rural areas only. These estimates mark a range of the spatial targeting of the Raedat Refiat program. Considering that nutrition and health of young children is a main focus of the Raedat Refiat program and that the Raedat Refiat program is designed to serve primarily rural communities, the theoretical coverage of the program can be expected to converge to the maximum estimates.

Table 2.6. Population and household estimates, 2017

	Population [a]			Households [a,b]		
	Total	***Rural***	***Urban***	***Total***	***Rural***	***Urban***
Lower & Upper Egypt	77,038,748	53,973,516	23,065,232	18,794,196	12,642,139	6,152,057
Upper Egypt governorates*						
Beni Suef	3,154,100	2,438,134	715,966	739,061	553,557	185,504
Menya	5,497,095	4,507,931	989,164	1,312,052	1,048,330	263,722
Assiut	4,383,289	3,248,225	1,135,064	1,001,937	725,402	276,535
Sohag	4,967,409	3,913,109	1,054,300	1,119,424	878,748	240,676
Qena	3,164,281	2,569,795	594,486	748,990	594,698	154,292
Luxor	1,250,209	744,669	505,540	295,602	165,242	130,360

Source: [a] CAPMAS (2018); [b] MOHP et al. (2015).
Note: * Excluding Aswan.

Table 2.7. Estimates of target households of the Raedat Refiat program, 2017

	Households with women of reproductive age (15–49 years) [a,b,c]			Households with women of reproductive age (15–49 years) and young children (0–59 months) [a,b,c]		
	Total	***Rural***	***Urban***	***Total***	***Rural***	***Urban***
Lower & Upper Egypt	15,596,484	10,748,298	4,834,563	7,063,295	5,150,801	1,891,327
Upper Egypt governorates*						
Beni Suef	627,613	474,435	152,348	335,181	244,414	92,033
Menya	1,087,080	895,056	191,754	539,415	462,344	76,752
Assiut	809,479	587,034	222,390	367,291	291,519	74,315
Sohag	921,536	725,196	196,316	351,105	288,226	62,715
Qena	656,572	526,097	130,606	321,657	256,442	65,244
Luxor	262,389	154,113	109,635	124,411	86,410	41,082

Source: [a] CAPMAS (2018); [b] MOHP et al. (2015); [c] own estimates, based on HIECS 2010–11 data.
Note: * Excluding Aswan.

Table 2.8 shows that there are large differences in coverage across governorates. Nevertheless, assuming that each Raeda Refia serves 500 households on average as given by the program's design, at least every fifth randomly selected target households in any considered Upper Egypt governorate except Menya should be served by a Raeda Refia under the least-targeted coverage scenario. Under the most-targeted coverage scenario, more than two-thirds of randomly selected target households in any considered Upper Egypt governorate except Menya should be served by a Raeda Refia. In Beni Suef and Luxor, there should be full coverage, if the program is well targeted.

These estimates imply for the household listing survey (and the baseline survey) that the probability of a sample household with a woman of reproductive age to have been visited by a Raeda Refia within the past year is about 32–45 percent on average, and about 68–78 percent for a sample household with a woman of reproductive age and a young child. Tables 2.6 and 2.7 imply that, in the considered governorates, 81–93 percent of all rural households have a woman of reproductive age and 33–53 percent of all rural households have a woman of reproductive age and a young child. Taken together, roughly 30–40 percent of all sample households should have been visited by a Raeda Refia within the past year. By program design, these households should have been visited four times over the past one year.

Table 2.8. Estimated Raedat Refiat program coverage

		Target households per Raeda Refia [a,b,c,d]				Raedat Refiat program coverage [a,b,c,d]			
	Raedat Refiat on duty [d]	Households with women of reproductive age (15–49 years)		Households with women of reproductive age (15–49 years) and young children (0–59 months)		Households with women of reproductive age (15–49 years)		Households with women of reproductive age (15–49 years) and young children (0–59 months)	
	Total	***Total***	***Rural***	***Total***	***Rural***	***Total***	***Rural***	***Total***	***Rural***
Lower & Upper Egypt	9,253	1,686	1,162	763	557	29.7	43.0	65.5	89.8
Upper Egypt governorates*									
Beni Suef	568	1,105	835	590	430	45.3	59.9	84.7	116.2
Menya	283	3,841	3,163	1,906	1,634	13.0	15.8	26.2	30.6
Assiut	413	1,960	1,421	889	706	25.5	35.2	56.2	70.8
Sohag	411	2,242	1,764	854	701	22.3	28.3	58.5	71.3
Qena	489	1,343	1,076	658	524	37.2	46.5	76.0	95.3
Luxor	268	979	575	464	322	51.1	86.9	107.7	155.1

Source: [a] CAPMAS (2018); [b] MOHP et al. (2015); [c] own estimates, based on HIECS 2010–11 data; [d] Jhpiego et al. 2017.
Note: * Excluding Aswan.

C. Selection of Comparison Households: Random-Walk Method

To construct a valid comparison group to the group of FAS farmers, households were randomly selected, using a random-walk method. To be comparable to FAS households, non-FAS households need to meet "hard" (that is, strictly-applied) FAS eligibility criteria, and, at the same time, must not be exposed to FAS interventions. The selection criteria for inclusion of a randomly selected household into the comparison group were:

1) Farming (that is, the household reports having a farmer who lives in the household and cultivates agricultural land);

2) Cultivation of FAS-promoted vegetables (green beans, onions, tomatoes, and sweet potatoes) or (main) herbs and spices (fennel, basil, marjoram, anise, parsley, mint, and geraniums) in the past five years;

3) No prior or existing commitment to a FAS-facilitated contract; and

4) No prior attendance of a FAS training for producing and marketing vegetables or herbs and spices.

The household listing survey also checks several other farm household characteristics, including farm size (that is, owned or rented agricultural land),[10] cultivation of FAS-promoted vegetables and herbs and spices in the summer season 2017 or winter season 2017–18, and presence of women of reproductive age.

The random-walk method included two basic steps for sampling households from a household cluster (village):

1) Identification of a starting point, and

2) Random selection of a household based on a predefined walking route.

Unlike in many previous surveys using the random-walk method, which defined the starting point at a central landmark in a cluster (e.g., main market, mayor's office, school, bus stop), IFPRI defined the starting point flexibly to reduce the so-called "main street bias" (Galway et al. 2012; Bauer 2014, 2016). The starting point was the address of the last visited FAS farm household, and FAS farm households and non-FAS farm households were visited alternately (starting with a FAS household). This procedure also increased the probability that a visited non-FAS farm household had agricultural and infrastructural conditions that were similar to the previously visited FAS farm household (yielding better matches in a matching estimation).

Applying the walking route rules and the household listing questionnaire, one valid comparison household was randomly selected for each successfully interviewed FAS household. The

[10] Despite FAS's focus on smallholder farm households, a maximum farm size of 10 feddans per household has not been strictly applied as a FAS eligibility criterion (as discussions with FAS revealed). Therefore, this criterion is not applied in selecting comparison households either.

sampling areas to apply the random-walk method were spatially limited by the boundaries of the villages where the FAS households were located. In strata with less than 50 selected and short-listed FAS households, the sample was oversampled for every fifth comparison household by randomly selecting an additional comparison household. IFPRI instructed El-Zanaty and Associates (ZA), the data collection firm, to ensure that the enumerators strictly followed the implementation protocol of the household listing survey. The protocol is presented in Appendix III.

D. FAS Beneficiary Households and Detectable Project Impact

Field work related to the household listing survey revealed critical problems in identifying selected FAS farm households that were actual project participants. To locate FAS farm households, ZA's enumerator teams visited the FAS partner associations to confirm personal information of the farmers recorded in the FAS farmer list and to ask association representatives and other local leaders for help in finding the farmers' houses and gaining introduction to the farmers.

Table 2.8 shows that, in total, only 60.3 percent of the listed FAS farmers could be identified and verified by the FAS partner associations to participate in the project. The low share of verified, listed FAS farm households seriously compromised the design of the study. There was no trace of one in four listed FAS farmers (24.9 percent), meaning that the name of this person and his personal information was unknown to the association representatives and other local leaders consulted. In one association in Assiut, no listed FAS farmer could be found. In many other associations, a considerable number of listed FAS farmers could not be identified.

Table 2.8. Identification of FAS farm households and comparison households

	Beni Suef	Assiut	Menya	Sohag	Luxor	Qena	Total	Percent
FAS farm households (selected and short-listed)								
Recorded on FAS list	608	50	256	837	65	102	1,918	100.0
Verified	418	0	179	419	53	87	1,156	60.3
Duplicate	0	0	4	146	5	0	155	8.1
Untraceable**	159	47	45	205	7	15	478	24.9
Identified but invalid*	31	3	28	67	0	0	129	6.7
Non-listed, but identified by association	13	0	2	6	0	0	21	
Randomly selected comparison households, corresponding to verified, listed FAS farmers								
Identified	437	0	192	344	64	98	1,135	
Unavailable/refused	4	0	2	91	0	0	97	
Nonexistent***	0	0	0	37	0	0	37	

Source: Own calculation, based on household listing survey data.
Note: * Person is dead (10 cases in total), moved out of the village (53 cases in total), has stopped farming (60 cases in total), or was confirmed by the association to not participate in FAS (6 cases in total). **Untraceable are names that could not be identified/traced in the villages where they belong to. ***Not enough households in the locality to be selected for controls.

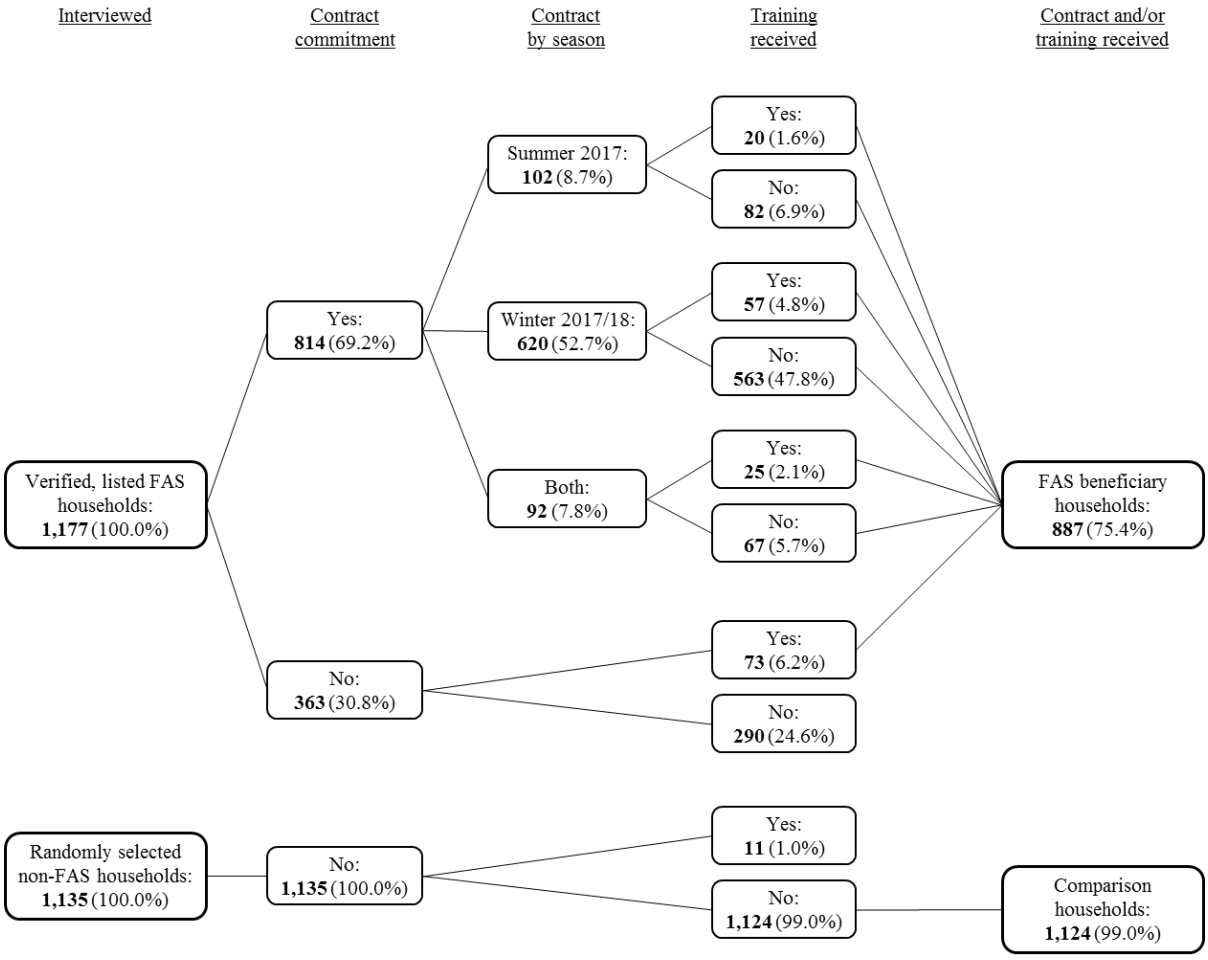
Following the random-walk method, 1,135 comparison farmers (equivalent to 98.2 percent of the number of verified, listed FAS farmers) were identified (Table 2.8). For 97 verified, listed FAS farmers—most of them from Sohag, a comparison farm household could not be identified because there were no eligible comparison farmers in the villages available, or they refused to be interviewed. In another village in Sohag, all eligible farm households were listed as FAS farmers, so there were no possible comparison household in this village, and the nearest neighboring village was far away and considerably different in its agricultural and infrastructural conditions. The identified and nonidentifiable households add up to 1,269 households, equivalent to 109.8 percent of the verified, listed FAS households (i.e., very close to the planned oversampling of 10.1 percent).

Even more concerning than the low number of participating farmers as identified by the FAS partner associations is the low number of possible FAS beneficiary households. The collected data of the household listing survey suggest that only 69.2 percent of all verified, listed FAS farmers committed to a FAS-facilitated forward contract signed individually or by the partner association on behalf of the participating farmers (Figure 2.1). By definition, all farmers listed on the FAS list, however, should have committed to a contract. Furthermore, only 14.9 percent of all verified, listed FAS farmers (175 individuals) ever attended a FAS training for producing and marketing vegetables or herbs and spices. Thus, the effects of FAS on project outcome indicators due to transfer of agricultural knowledge and skills among the listed FAS farmers can be expected to be very low.

Further, if existent at all, the project effects cannot be detected statistically, because the study design does not accommodate such an unexpected low coverage. Only 69.7 percent of all listed FAS farmers (820 individuals) reported that they attended a FAS introductory meeting. Of all

1,177 interviewed farmers recorded on the FAS list, 24.3 percent reported that they never attended a FAS introductory meeting or a FAS production and marketing training. And, 44.1 percent of these farmers (164 individuals) did not commit to a contract either. This raises the question of how these farmers got on the FAS list in the first instance.

Figure 2.1. Sample structure for FAS beneficiary and comparison households



Source: Own calculation, based on household listing survey data.

Having a forward contract without having received any training on how to improve agricultural production and how to comply with and benefit from such a contract is very unlikely to result in positive project impact especially in the case of high-value horticulture in Upper Egypt. Findings from FAS's value chain and end-market studies (CNFA 2016) and anecdotal evidence from previous projects similar to FAS suggest that farmers' lack of knowledge of good agricultural practices and compliance with forward contracts are key challenges to achieve project impact. Only 12.5 percent of the listed FAS farmers who committed to a contract ever attended a FAS-related training (Figure II.D). Despite these concerns on possible project impact and assuming that FAS redefines a beneficiary farmer as somebody who ever attended a FAS training or committed to a FAS-facilitated forward contract, the treatment group would

consist of 887 farm households—that is still only three-fourths of the listed farmers (75.4 percent).

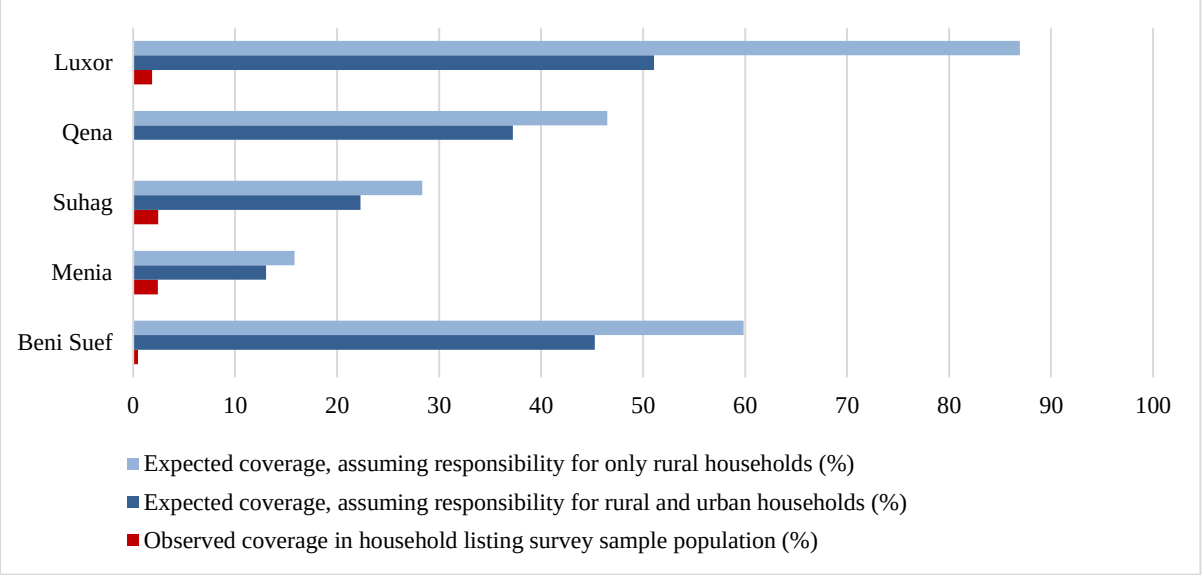
As an indication for accurate implementation of the household listing survey and the formulation of survey questions (which are identical for the treatment and comparison groups), none of the randomly selected non-FAS households reported to have committed to a FAS forward contract and only 11 households (1.0 percent) reported that a household member ever attended a FAS training. To rule out any "effect contamination" due to FAS training attendance, these 11 households were dropped from the comparison group used in the analysis presented in the next subsection. All comparison households reported to have produced FAS-promoted vegetables and herbs and spices in the past five years, and most of them (95.7 percent) produced these crops in the summer season 2017 or the winter season 2017–18.

Raedat Refiat Program Coverage and Detectable IMCHN Effects

A woman aged 15–49 years with a child (of any age) was found in 2,211 households (or 95.6 percent of the 2,312 FAS and non-FAS farm households). This proportion is higher than in the rest of the rural population in the six Upper Egypt governorates (see Section II.B). However, only 1.5 percent of these households (33 households) received a visit from a Raedat Refia in the 12 months prior to the household listing survey (Figure 2.2). This unexpected, extremely low coverage of the Raedat Refiat program does not permit for any meaningful analysis of potential IMCHN effects. Hence, the main finding is that the Raedat Refiat program hardly reaches the target population, at least in the sample areas of IFPRI's study.

Of those 33 visited households, more than half (19 households) were visited once in the past 12 months, about one-fourth (9 households) were visited twice or three times, and less than one-fifth (5 households) was visited four or more times—that is, the average planned frequency of Raedat Refiat visits per year.

Figure 2.2. Expected and observed coverage of the Raedat Refiat program



Source: Own calculation, based on household listing survey data.
Note: Coverage is calculated for household with women of reproductive age.

E. Key Findings from Listing Survey

Only 60.3 percent of the listed FAS farmers (1,135 out of 1,918) could be identified and be verified by the FAS partner associations to actually participate in the project, which raises serious concerns about the accuracy of project participation records.

Out of those verified farmers, only 69.2 percent committed to a FAS-facilitated forward contract signed individually or by the partner association on behalf of the participating farmers. By design, *all* listed FAS farmers should have committed to a FAS-facilitated forward contract. In addition, only 12.5 percent of the listed farmers who committed to a contract also attended a FAS training on agricultural production and marketing. Another 6.2 percent attended a training but did not commit to a contract.

However, only having a forward contract without having received any training on how to improve agricultural production and how to comply with and benefit from such a contract is very unlikely to result in project impact. Therefore, it should be noted that, because of apparent nonparticipation of treatment households and the low dose of treatment, no detectable project impact can be realistically expected, at this point.

Table 2.9 compares FAS beneficiary households with comparison households. All FAS-listed households that committed to a FAS-facilitated forward contract or ever attended a FAS training are considered to be FAS beneficiary households. Table 2.9 compares the means of the FAS outcome indicators between the beneficiary and comparison groups. The estimates are derived from the farm household baseline survey data. Out of the 887 beneficiary households interviewed in the household listing survey, 862 households (97.2 percent) were also interviewed in the farm household baseline survey. The attrition rate is similar for the

comparison group: 1,090 households out of 1,124 households (97.0 percent) were re-interviewed.

Because there is arguably no substantial FAS intervention that has the potential to yield detectable project impact, any statistically significant difference in mean outcomes shown in Table 2.9 is due to differences in the groups before FAS—and is not the effect of FAS.

Table 2.9. Differences in main outcome indicators between beneficiary and comparison groups of the FAS baseline study

	Beneficiary households			Comparison households			Difference	Mean difference test[b]	
	Mean	SD	N	Mean	SD	N	% change	SE	Sign.
Per capita household expenditure									
Total consumption (EGP/month)	707.8	351.2	862	668.7	321.0	1,090	5.8	19.73	*
Food consumption (EGP/month)	442.0	241.2	862	413.3	204.5	1,090	7.0	13.82	**
Farm production and output									
Summer season 2017									
Total cultivated land (feddans)	2.43	2.42	756	1.92	2.67	961	26.6	0.14	***
Yields of FAS-promoted crops (kg/feddan)[a]									
Green beans	2.54	1.87	103	2.76	2.17	104	-7.9	0.22	
Basil	8.27	11.56	72	7.59	11.50	65	9.0	2.46	
Winter season 2017–18									
Total cultivated land (feddans)	2.65	2.83	834	2.00	2.67	1,062	29.3	0.15	***
Yields of FAS-promoted crops (kg/feddan)[a]									
Green beans	4.03	1.63	65	4.49	2.01	68	-10.2	0.54	
Onions	12.72	4.92	200	11.95	4.53	134	6.4	0.48	
Dietary diversity									
Household Dietary Diversity Score (HDDS; max = 12)	8.32	1.52	844	8.30	1.54	1,077	0.3	0.09	
Minimum Dietary Diversity for Women (MDD-W; max = 10), for mothers age 15–49 years	4.67	1.32	351	4.64	1.20	510	0.7	0.11	
Infant and Young Child Feeding (IYCF) practices									
Children age 6–23 months									
Minimum acceptable diet (%)	17.3		139	25.3		229	-8.1	3.53	**
Consumption of iron-rich foods (%)	22.9		140	23.6		229	-0.7	3.51	
Nutritional status									
Children age 0–59 months									
Height-for-age z-score (HAZ)	-0.84	1.40	451	-0.82	1.39	650	2.8	0.08	
Weight-for-height z-score (WHZ)	0.29	1.15	454	0.20	1.19	647	42.0	0.07	
Mothers (nonpregnant) age 15–49 years									
Body mass index (BMI; kg/m^2)	27.38	5.53	952	27.28	5.58	1,185	0.4	0.26	

Source: Own estimation, based on farm household baseline survey data.

Note: [a] Statistics for FAS-promoted crops are presented if there were at least 20 beneficiary households who cultivated and harvested the crops.

[b] The significance of mean difference is assessed by an estimation regressing the outcome variable on the group variable identifying beneficiary and comparison households. Standard errors (SE) are clustered at the village level. ***, **, * Per the p-value of the coefficient estimate, mean difference is statistically significant at the 1, 5, and 10 percent level, respectively.

FAS beneficiary households have significantly higher total and food expenditures per capita than the comparison households (Table 2.9), which suggests that beneficiary households have higher household income. FAS beneficiary households also cultivated significantly larger areas of agricultural land in both the summer season 2017 and the winter season 2017–18, indicating larger farm sizes among the farmers that were enrolled into FAS. Moreover, FAS beneficiary farmers are significantly more likely to own expensive agricultural assets such as a tractor. This is expected, as larger farmers tend to have more resources to participate in agricultural projects and hence to cope with potential production and marketing risks that may come along with project participation (Oakley 1991).

Table 2.9 presents yields for the most commonly cultivated FAS-promoted crops by season. There is no statistically significant difference in the harvest yields between beneficiary and comparison households. The number of observations suggest that the two most common crops in the summer season 2017 were cultivated by only 20.3 percent of beneficiary households (103 households produced green beans, and 72 households produced basil), and 30.7 percent of beneficiary households in the winter season 2017–18 (65 households produced green beans, and 200 households produced onions).

There is also no statistically significant difference in any dietary diversity and nutrition outcome indicator between beneficiary and comparison households, except for the proportion of children age 7–23 months who had a minimum acceptable diet (Table 2.9). In fact, the proportion of children with a minimum acceptable diet is higher in the comparison group than the beneficiary group. It should be also noted that the implementation of the planned activities of the fourth FAS component to improve the nutritional status of women and children (that are, sending SMSs promoting good nutrition to women from farm households and provision of an agri-nutrition resource toolkit to community health workers) has not started at the time of the farm household baseline survey. Thus, the farm household baseline survey would serve well as a baseline, for the health and nutrition knowledge component. At this point, no FAS impact can emerge from this component either.

Taken together, these results confirm that there is indeed no evidence to suggest that there was any detectable project impact of FAS in the sample population. As such, in addition to serving as baseline information against which future FAS interventions can be assessed, the remainder of this report uses the unique dataset to provide a novel description of farm households in Upper Egypt presenting results for the entire sample including both FAS and non-FAS households. Such an approach is not only expected to provide important information and guidance on agricultural and nutrition- and health-related program design, but it can also inform and guide policy on how to leverage linkages between agriculture, nutrition, and health for improving food and nutrition security in rural Upper Egypt.

III. FARM HOUSEHOLD BASELINE SURVEY ANALYSIS

A. Methods of Baseline Survey Analysis

This chapter provides a brief summary of methods used in analyzing the baseline farm household survey, including the survey structure and sample size; the creation of variables; and data analysis.

Survey Structure and Sample Size

Following the household listing survey described in Chapter IV, the farm household baseline survey was administered to both FAS and non-FAS households[11]. It included two questionnaires:

i) Household questionnaire (see Appendix VI), and

ii) Anthropometry questionnaire (see Appendix VII).

The farm household baseline survey was applied to a sample of 2,312 households. Out of this sample, 2,246 household surveys were completed (Table 3.1). The anthropometry questionnaire was completed by children and their mothers (or caretakers) from 1,908 households.

Table 3.1. Frequency of completed interviews

Interviews	N	Percent
Complete	2,246	97.15
Partially complete	7	0.26
No available respondent	3	0.13
Refusal	17	0.74
Other	39	1.69
Total	2,312	100.00

Source: Own estimation, based on farm household baseline survey data.

Variable Creation

In order to assess the study outcomes presented in Section I.A, data from the farm household baseline survey were used to construct variables that can be used for analysis of characteristics of farm households in Upper Egypt. The variables created in this study are summarized in the subsections below:

[11] Appendix IV provides a detailed description of all the questionnaires.

1) Total Household Expenditure Per Capita

Household consumption expenditure[12] is a good proxy for household income, as it is easier to collect and generally considered a more accurate measurement for household well-being, compared to measuring income directly (Deaton and Zaidi 2002). Respondents tend to better remember regular cash inflows and outflows than irregular ones. Food and usual non-food expenditures occur very regularly at usually similar amounts (and prices are often well known). In contrast, especially among farm households (as well as households with casual workers and in non-permanent employment), cash outflows (such as for agricultural inputs) and cash inflows (such as from harvest sales) tend to be seasonal and occur at large and often varying amounts. Moreover, respondents tend to be less reluctant to report expenditures than income as well as smaller cash amounts (such as most expenditure items) than larger cash amounts (such as income), particularly in interview settings where family members, neighbors, or other community members are present.

Household expenditures included food expenditures on a seven-day recall basis (rescaled to one-month[13]) and nonfood expenditures that were also rescaled to a one-month basis. The following list provides an overview of the main consumption variables used in this report:

- *Per capita value of food consumption:* Per capita monthly value of food consumed by household members in EGP.

- *Per capita value of cereals consumed:* Per capita monthly value of cereals consumed by household members in EGP. Cereals included local rice, flour, bread (Baladi and pita), grits, pasta, and other cereals.

- *Per capita value of vegetables consumed:* Per capita monthly value of vegetables consumed by household members in EGP. Vegetables under this category included tomatoes, okra, bell peppers, eggplants, zucchinis, green beans, peas, cucumbers, carrots, onions, garlic, cabbage, cauliflower, molokhia, spinach, and other vegetables.

- *Per capita value of animal-source foods consumed:* Per capita monthly value of animal-source foods consumed by household members in EGP. Under this category were included meat (beef, chicken, mutton and goat, poultry, and organs, etc.), fish, eggs, milk, and dairy products.

- *Per capita value of fruits consumed:* Per capita monthly value of fruits consumed by household members in EGP. Under this category were included apples, oranges, lemons, berries, peaches, bananas, cantaloupes, watermelons, grapes, guavas, and other fruits that were reported for a low percentage of households (included as "other fruits").

[12] The terms "expenditure" and "consumption" are used interchangeably throughout the report for household consumption expenditure.

[13] We rescale food expenditures by calculating daily food expenditures based on the 7-day recall data and then multiply the daily food expenditure by the average number of days per month (30.4 days).

- *Per capita value of sugar foods consumed:* Per capita monthly value of sugar foods consumed by household members in EGP. Under this category were included sugar, honey, molasses, and other sweets.

- *Per capita value of fats and edible oils consumed:* Per capita monthly value of fats and oils consumed by household members in EGP. Under this category were included cooking oils, margarines, ghee, and butter.

- *Per capita value of subsidized foods consumed:* Per capita monthly value of subsidized foods consumed by household members in EGP. Under this category were included rice, flour, Baladi bread, pasta, cooking oil, and sugar.

- *Per capita value of nonfood consumed:* Per capita monthly value of consumption from nonfood products in EGP. Nonfood consumption includes all expenditures considered as nonfood consumption.

- *Per capita nonfood expenditures:* Per capita monthly value of nonfood expenditures in EGP including monthly and yearly nonfood expenditures.

- *Per capita expenditures on social events:* Per capita monthly value of expenditures in EGP from weddings, engagements, funerals, dowry, or other major social events that occurred in the last 12 months in the household.

- *Per capita expenditures on schooling:* Per capita monthly value of expenditures in EGP from tuition fees, private tutoring, uniforms, books, and school supplies that occurred in the last 12 months in the household.

- *Per capita expenditures on healthcare***:** Per capita monthly value of expenditures in EGP from medicines, pharmaceutic products, public and private hospitals, and community health workers services that occurred in the last 12 months in the household.

- *Per capita expenditures on energy:* Per capita monthly value of expenditures in EGP from gas and electricity that occurred in the last month in the household.

- *Per capita total household expenditure:* Per capita monthly value of food and nonfood expenditures in EGP.

2) Farm Production and Output

Most agricultural indicators were directly derived from the questions in the agricultural modules of the farm household baseline survey without considerable transformation of the original survey variables. All variables referring to farmland use and crop cultivation, harvest, and marketing are reported for the summer season 2017 and the winter season 2017–18 separately. The main outcome indicators of farm production and output are as follows:

- *Crop yields*: The seasonal yield of a crop is defined as the total harvested quantity (at the time of the survey) over the land area cultivated with this crop. For crops that are

harvested in batches, the harvested quantity is summed up over all harvest batches. Yields are first calculated at the field level (as farmers may cultivate more than one field with the same crop) and then averaged at the farm household level. Obvious extreme yield values are replaced with missing observations to obtain fairly outlier-unbiased mean yield estimates. Yields are reported in tons per feddan.

- *Shares of harvest sold*: The share of the crop harvest that a farmer sold is defined as the total quantity sold over the total quantity harvested (at the time of the survey). The ratio is first calculated at the level of harvest batches per field and then averaged at the farm household level. The shares of harvest sold are reported in percentage.

These outcome indicators are presented for the most commonly cultivated crops by season among the farm household baseline sample population. Crops are included in the analysis if they were cultivated by at least 2 percent of all farmers in both the summer season 2017 and the winter season 2017–18. This is equivalent to at least 40 household observations per season. Estimates of yields and shares of harvest sold are reported in tables of summary statistics if they are based on at least 20 household observations.

3) Household Dietary Diversity Score (HDDS)

HDDS was constructed according to Food and Nutrition Technical Assistance (FANTA) guidelines (Swindale and Billinski 2006). The food preparer in each household was asked if the household had consumed foods from 12 predefined food groups in the past 24 hours. The total number of foods was summed to provide a simple score out of a maximum of 12.[14] Once HDDS was calculated, the type of food groups consumed were compared between households with a HDDS less than eight (the median dietary diversity in the sample) and those with a HDDS greater than or equal to four.

4) Women's Dietary Diversity

The Minimum Dietary Diversity for Women (MDD-W) indicator assesses the dietary diversity among women of reproductive age, i.e. between 15 and 49 years of age (FAO and FHI 360 2016). Intake of foods from 10 predefined food groups within the previous day or night was recorded. Women with scores lower than five, cutoff defined in the MDD-W, are likely to have inadequate micronutrient intakes.

5) Infant and Young Child Feeding (IYCF) Practices

IYCF is key for children's development and survival. The World Health Organization (2010) instrument manual was used to construct the IYCF indicators of breastfeeding and

[14] The 12 HDDS food groups are cereals and grains; roots and tubers; legumes, nuts, and pulses; milk and dairy products; eggs; meat and poultry; fish and seafood; fruits; vegetables; oils and fats; sugar, honey, sweets, and snacks; and miscellaneous.

complementary feeding of children 0–23 months of age. The following IYCF indicators were used in this report:

- *Child ever breastfed:* Proportion of children 0 to 23 months of age ever given breast milk (based on historical recall of the primary caregiver).
- *Early initiation of breastfeeding:* Proportion of children 0–23 months of age that were put to the breast within one hour of birth (the indicator relies on the historical recall of the primary caregiver).
- *Exclusive breastfeeding of children among children under six months of age:* Proportion of children aged 0–5 months of age who were given nothing but breast milk (no other liquids or solids) in the past 24 hours. It must be noted that the indicator does not calculate the percentage of children under the age of six months that were exclusively breastfed; it only defines the percentage of children less than six months of age that were exclusively breastfed in the last 24 hours. The indicator likely overestimates the children that were exclusively breastfed.
- *Predominant breastfeeding among children under six months of age:* Proportion of children 0–5 months of age given breast milk and any other liquids (including water), but no solids, in the past 24 hours. Those children classified as exclusively breastfed by the previous indicator are also classified as predominantly breastfed.
- *Continued breastfeeding at one year of age (12–15 months):* Proportion of children 12–15 months of age who were breastfed in the past 24 hours.
- *Continued breastfeeding to two years of age (20–23 months):* Proportion of children 20–23 months of age who were breastfed in the past 24 hours.
- *Age-appropriate breastfeeding:* Proportion of children from birth to 6 months of age given only breast milk in the past 24 hours, and the proportion of children 6–23 months of age who received breast milk, as well as solid, semisolid or soft foods, during the previous day.
- *Bottle feeding:* Proportion of children 0–23 months of age fed using a bottle in the past 24 hours.
- *Milk feeding frequency for non-breastfed children (≥ 2 milk feedings/day):* Proportion of non-breastfed children 6–23 months of age given at least two milk feeds in the past 24 hours.
- *Introduction of solid, semisolid or soft foods (6–8 months):* Proportion of children 6–8 months of age given solid, semisolid or soft foods in the past 24 hours.
- *Consumption of iron-rich or iron-fortified foods:* Proportion of children 6–23 months of age that were fed iron-rich food (or food that was fortified with iron and made especially for children) in the previous 24 hours.

- *Minimum dietary diversity (≥ 4 food groups):* Proportion of children 6–23 months of age who consumed at least four food groups (out of seven nutrient-rich food groups) in the past 24 hours.[15]

- *Minimum meal frequency:* Proportion of children, both breastfed and non-breastfed, given a minimum number of meals in the past 24 hours. For breastfed children aged 6–8 months the minimum number of meals was set at two, for breastfed children aged 9–23 months the minimum number of meals was set at three, and for non-breastfed children the number of meals was set at four.

- *Minimum acceptable diet:* Proportion of children 6–23 months of age who received the minimum acceptable diet. This indicator was calculated for both breastfed and non-breastfed children: for breastfed children it was defined as meeting both the minimum dietary diversity and the minimum meal frequency requirements, and for non-breastfed children, it was defined as having received at least two milk feedings, having consumed at least four food groups (out of six nutrient-rich food groups), and reaching the minimum meal frequency in the past 24 hours.[16]

6) Nutritional Status of Young Children and Their Mothers

Nutritional status was assessed through taking anthropometric measures for mothers or primary caregivers in the household, along with all children in the households below the age of five years old. Anthropometric data were then used to construct the following indicators:

- *Maternal body mass index (BMI)*: Calculated as weight (kg) / height^2 (m^2). Four BMI categories were created: underweight (BMI < 18.5), normal weight (BMI 18.5–24.9), overweight (BMI 25–29.9), and obese (BMI ≥ 30) (WHO 1995).

- *Child height-for-age z-score (HAZ), weight-for-height z-score (WHZ), and body mass index z-score (BMIZ)*: Calculated using the 2006 WHO growth standard (WHO 2006). Stunting was defined as HAZ < -2 standard deviations (SD), wasting as WHZ < -2 SD, at risk of being overweight as BMIZ > 1 SD, overweight as BMIZ > 2 SD, and obese as BMIZ > 3 SD.

7) Maternal Health and Nutrition Knowledge and Practices

Maternal health and nutrition knowledge of mothers/caretakers is the primary outcome of the IMCHN evaluation project. The level of health and nutrition knowledge was assessed through asking a series of questions. They were also asked a series of specific questions about IYCF practices (breastfeeding and appropriate complementary feeding practices), the prevention of

[15] The seven food groups are grains, roots, and tubers; legumes, nuts, and pulses; milk and dairy products; eggs; flesh foods; vitamin A–rich foods; and other fruits and vegetables.

[16] The six food groups include grains, roots, and tubers; legumes, nuts, and pulses; eggs; flesh foods; vitamin A–rich foods; and other fruits and vegetables.

diarrhea (hygiene practices). The following list provides an overview of the indicators used in this report:

- *Hygienic practices knowledge:* Proportion of women who mentioned a certain hygienic practice, regarding when to wash hands and how.
- *Health and nutrition knowledge:* Proportion of women who know the constituents of a healthy diet, the nutrients in different food groups, and ways for achieving a healthy weight.
- *Health views:* Proportion of women who have correct views on what is beneficial or damaging to health.
- *Child's nutrition knowledge:* Proportion of women who give the correct answer on newborn children's nutrition, including knowledge on breastfeeding, colostrum feeding, and introducing food and drinks to children.
- *Diarrheal disease knowledge:* Proportion of women with knowledge on receiving oral rehydration solution (ORS), preventing diarrhea and treating it.
- *Child's health and nutrition knowledge:* Proportion of women mentioning effects of poor nutrition on children's health.

8) Other Indicators

Other indicators were constructed to reflect household characteristics. These include the following:

- *Dependency ratio:* The ratio of persons who are economically dependent on those who provide for them, within the household. Calculated by dividing the number of people in the household aged under 15 and those aged above 65 or older (deemed not economically active) by the number between 15 and 65 years of age (deemed potentially economically active).
- *Maternal literacy*: Literacy was measured by asking mothers to read a sentence. The women were classified as literate if they could read the entire sentence, partially literate if they could read a little, and illiterate if they could not read the sentence at all.

Data Analysis

The data were analyzed using Stata version 15. Variables and indicators are presented as either percentages or means (and median, if appropriate) and standard deviations (SD). Results are presented either at the individual level or at the household level, as appropriate. The number of observations is reported either in the results tables or in a note under each table. In some cases, groups are compared. All comparisons use cluster-robust standard errors.

B. Farm Household Characteristics

The following sections describe the main characteristics of farm households in Upper Egypt that participated in the survey. Specifically, this chapter provides a brief description of the households' demographic structure, occupation, education, as well as indicators of the households' well-being, such as quality of housing conditions, access to basic services, sanitation, and ownership of assets. Whenever relevant, the description relates findings from the farm household baseline survey to other available data sources (such as HIECS and DHS) to put the key household characteristics into the broader context.

Household Composition

On average, farm households in the sample have 5.1 members (Table 3.2), similar to the average farm household size observed from Egypt's nationally representative household income and expenditure survey (HIECS) in the governorates where the sample was selected (HIECS 2015). The dependency ratio—the ratio of those who are typically not in the labor force (under 15 and older than 65 years) and those who are typically in it (between 15–64 years old)—is 0.8. This indicator has been used, for example, to measure the availability of household resources for investments in human capital formation of young children (Hadley et al. 2011; Lam and Marteleto 2008). A dependency ratio of 0.8 indicates that the number of dependents does not exceed the number of potential earners.

There were 1.2 women on average per household of reproductive age (15–49 years old) and 0.6 children under five years of age, compared to 1.14 and 0.68, for farm households in these areas (HIECS 2015). The number of children below and above age 18 in the household was also quite similar to the average found based on HIECS estimates (2.9 and 2.1, respectively). However, households in the sample were older in comparison with their peers in the same governorates of the study: for example, the average age of the head was 46.5 and the spouse 39.3, in contrast with 50.1 and 43.4, respectively, for farm household in the same areas. Overall, the results suggest that the demographic structure of the households in the sample is comparable with the average farm household in the same areas.

Table 3.2. Demographic characteristics of interviewed farm households

	Mean ± SD / Percent (N = 2,246)
Number of household members	5.1 ± 2.03
Number of adults (≥ 18 years old)	2.8 ± 1.21
Number of minors (< 18 years old)	2.2 ± 1.81
Dependency ratio	0.8 ± 7.6
Number of women 15–49 years old	1.2 ± 0.80
Number of children 0–59 months old	0.6 ± 0.80
Gender of household head (% male)	97.6
Age of household head (years)	46.5 ± 12.8
Age of spouse of head (years)	39.3 ± 11.2

Source: Own estimation, based on farm household baseline survey data.

Occupation and Education

The analysis of labor patterns is a good indicator for the role that agricultural activities play for farm households in Upper Egypt. In Egypt, around 30 percent of the population is employed in agriculture, but rural (farm) households in Upper Egypt are heterogeneous in terms of the level of dependency on agricultural activities (El-Enbaby et al. 2016). In fact, only a small percentage of rural households has one or more of its members exclusively occupied in agricultural activities (Nin-Pratt et al. 2018). In contrast to this general pattern among rural (farm) households, reliance on agriculture is higher among households in our survey, with at least one person in the household who identified farming as his/her primary occupation.

Farming continues to be mostly done by men, whereas only few women reported farming as their first or second occupation (see Table 3.3); in most cases, the household head was the person who provided the information on farming activities in the household (95.4 percent). When asked about the main occupation of the household head, 78.6 percent of households reported farming (Table 3.3), with a large share of these individuals farming on their own land (61.8 percent). In 12.3 percent of the households, the spouse reported farming as a main occupation, and 11.6 percent of the spouses reported a secondary occupation. Among those with a secondary occupation, the majority reported being occupied in agriculture (70 percent). Furthermore, only 13.7 percent of households had at least one woman whose main occupation was in agriculture. These low numbers confirm the generally very low female labor market participation rate in Egypt.

Table 3.3. Main and secondary occupation of household head and spouse

	Percent	N
Share of households where:		
Head is the main farmer and main occupation is farming	95.4	2,246
Head farms own land as a main occupation	61.8	2,246
Head farms someone else's land as a main occupation	16.8	2,246
Head is public sector employee as a main occupation	12.4	2,246
Share of households where spouse has main occupation:		
Farmer	12.3	2,114
Housewife	84.0	2,114
Share of households where:		
Head has secondary occupation	24.3	2,246
Spouse has secondary occupation	11.6	2,114

Source: Own estimation, based on farm household baseline survey data.

Formal education levels among farm households in Upper Egypt tend to be lower than among nonfarm households, and higher among the surveyed farm households compared to other farm households in the same governorates. Among non-farm, rural households, 49.5% of household heads had no formal education (rural areas in the same governorates of the survey) and 59.2% of spouses had no formal education (HIECS 2015). Comparing these numbers with farm households in Upper Egypt for the same areas, it is possible to observe that 73 percent of household heads, and 84.4 percent of spouses did not have any formal education in these areas (HIECS 2015). Compared to this, farmers in our Farm Baseline Household Survey tend to be more educated: 42.2 percent of household heads did not complete primary school, and about one-third did not have any formal education (Table 3.4). Further, 60.1 percent of spouses did not complete primary education, and half of them (50.4 percent) did not have any formal education at all.

Table 3.4. Education of household head and spouse

	Percent (N = 2,114)
Share of households where household head:	
Has no education[a]	29.7
Has incomplete primary school[b]	12.5
Has complete primary school[c]	5.5
Has incomplete secondary school[d]	9.0
Has complete secondary school[e]	30.8
Head has secondary school or more[f]	12.3
Share of households where spouse	
Has no education[1]	50.4
Has incomplete primary school[2]	9.7
Has complete primary school[3]	4.1
Has incomplete secondary school[4]	13.4
Has complete secondary school[5]	17.1
Head has secondary school or more[6]	5.0

Source: Own estimation, based on farm household baseline survey data.
Note: [a] Never attended school; [b] completed 1–5 grades of primary education; [c] completed grade 6 of primary education; [d] completed 1–3 grades of preparatory or 1–2 grades of secondary education; [e] completed grade 3 of secondary education; [f] completed secondary and attended higher education.

Although education of the household head and the spouse provide a proxy for the overall educational level of the household, parental education, particularly that of mothers, is key for child nutrition (Burchi 2012; Alderman and Headey 2017; Leroy et al. 2014; Aitsi-Selmi et al. 2012; Glewwe 1999). In the sample, more than half of the mothers of children 0–5 years old interviewed could not read at all (57.5 percent), and only one-third were able to read fluently. Hence, the low level of education of mothers might be a barrier for improving children's nutrition for these households.

Table 3.5. Literacy of mothers of children 0–5 years

	Percent (N = 1,817)
Reading skills	
Cannot read at all	57.5
Can read a little	11.9
Can read everything	30.6

Source: Own estimation, based on farm household baseline survey data.

Housing Conditions and Household Assets

Housing conditions and household assets are indicators of a household's socioeconomic status. As shown in Table 3.6, 85.7 percent of the families interviewed live in their own home, whereas 14.3 percent rent it or used it for free. Also, most families live in an apartment or a freestanding house (35.7 and 60.3 percent, respectively), and only a small share of the households share their place with other families (5.2 percent). The average house had 3.3 rooms and was constructed mostly with bricks and concrete (in 82 percent, concrete was used to construct the roof, and in 95 percent of dwellings, bricks were used to construct the walls). However, around one out of five families live in households with dirt floors, which has been associated with parasitic infections, particularly among small children (Cattaneo et al. 2009; Miguel and Kremer 2004; Morales-Espinoza et al. 2003).

Table 3.6. Housing conditions

	Percent / Mean ± SD (N = 2,246)
Home ownership	
Owned (%)	75.5
Owned jointly (%)	10.2
Rented or using for free (%)	14.3
Type of dwelling	
Apartment (%)	35.7
Free standing house (%)	60.3
Single Room (%)	4.0
Share dwelling (%)	5.2
Number of rooms	3.3 ± 1.08
Type of floor	
Dirt (%)	19.9
Concrete or cement (%)	38.7
Ceramic tiles (%)	19.2
Cement tiles (%)	22.2

Source: Own estimation, based on farm household baseline survey data.

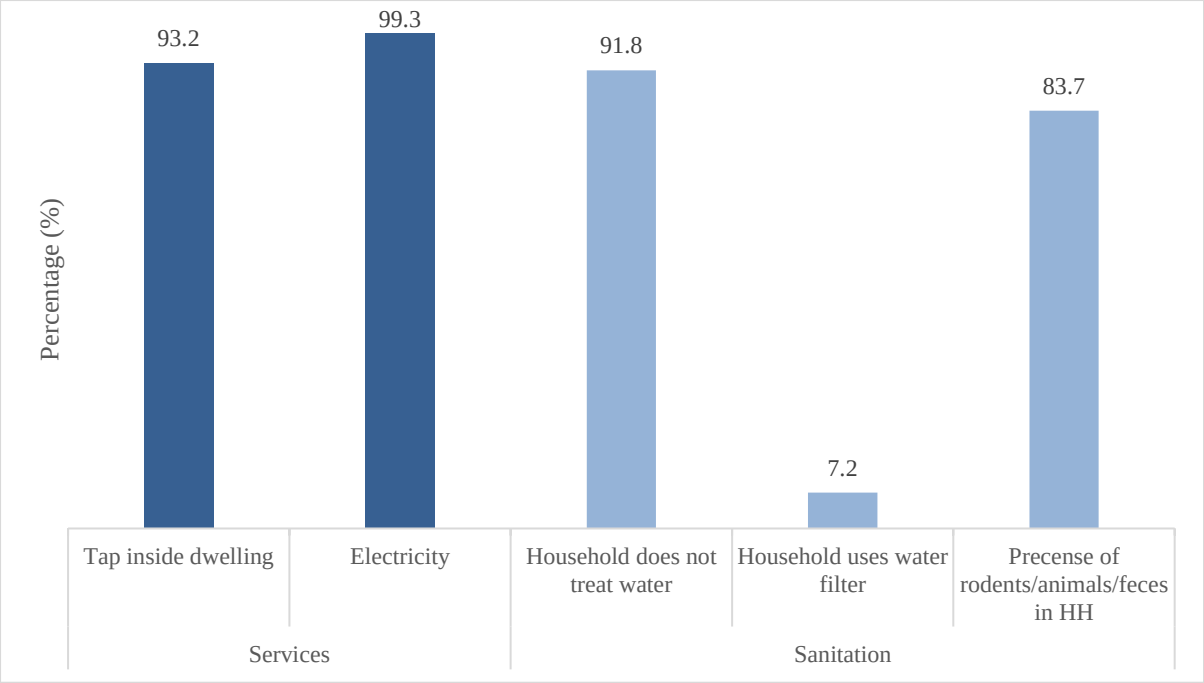
In line with DHS estimates on household sanitation conditions in rural areas in Upper Egypt, the large majority of households interviewed have access to tap water and electricity (MOHP et al, 2015). As shown in Figure 3.1, 93.2 percent of households reported access to water inside the dwelling, and practically all households had access to electricity (99.3 percent). However, most households did not use any method for treating water (91.8 percent) and in 83.7 percent of the households interviewed, the presence of animals (goats, chickens, rabbits, or feces of rodents) was observed.

Another indicator of a household's socioeconomic status is given by the number (and quality) of assets possessed by the household (Table 3.7). Households were asked whether someone in the household possessed different assets from a list of 34 items. The average household had 15.39 assets (Table 3.7). Only a small proportion of households in the sample possessed a means of transportation like a car or motorcycle. A total of 6.3 percent had a car, 22.3 percent

owned a motorcycle, and 5.2 percent a motor tricycle. Basic appliances were present in most households; above 90 percent of households had a refrigerator (97.2 percent), an oven (89.4 percent), and a fan (97 percent). Ownership of high-value appliances, such as air conditioner, freezer, or dish washer, was rare among the households interviewed.

A mobile phone was owned by 92.3 percent of the households, and in one-third, members owned a smart phone (35.6 percent). Ownership of computers and internet connection were low, at 8.8 percent and 4.6 percent, respectively. In terms of electronic equipment, most households reported owning a television (TV) and satellite dish (98.9 and 98.2 percent, respectively), but less than 10 percent owned a radio. There was also a high percentage of households owning furnishing: 98 percent of the households had a bed, a mattress, or both, and over three-quarters of the households had a sofa, chairs, or table. Finally, ownership of watches or jewelry was found in 27 and 28 percent of the households, respectively.

Figure 3.1. Household services and sanitation



Source: Own estimation, based on farm household baseline survey data.

Table 3.7. Ownership of household assets

	Percent / Mean ± SD (N = 2,246)
Share of households owning:	
Assets: total household assets (mean)	15.3 ± 2.9
Car/truck/minibus (%)	6.3
Motorcycle/motor scooter (%)	22.3
Motor tricycle (%)	5.2
Bicycle (%)	1.2
Refrigerator (%)	97.2
Freezer (%)	2.5
Stove (%)	99.2
Oven (%)	89.4
Dish washer (%)	0.2
Full-automatic washing machine (%)	5.1
Half-automatic washing machine (%)	18.2
Manual washing machine (%)	78.9
Water heater (%)	41.3
Air conditioner (%)	3.9
Electric fan (%)	97.2
Landline (%)	1.2
Smartphone (%)	35.6
Mobile phone (%)	92.3
Computer (%)	8.8
Internet (%)	4.6
TV (%)	98.9
Satellite dish (%)	98.2
Radio (%)	9.3
Bed (%)	98.6
Mattress (%)	98.5
Sofa (%)	86.9
Chairs (%)	75.8
Table (%)	76.7
Tablia (%)	76.9
Zeer/kola (%)	52.1
Wrist watch (%)	27.8
Gold/jewelry (%)	25.3
Extra real estate (%)	2.8
Microwave (%)	0.4

Source: Own estimation, based on farm household baseline survey data.

Social Protection

Over one-third of households received income from pensions, social protection programs, or both, and on average the amount received was EGP 518.7 per month, equivalent to EGP 125.5 per capita each month (Table 3.8). This amount is equivalent to 23.3 percent of total per capita expenditures observed for the households in the sample. Some 88.6 percent of the households benefited from the Egyptian food voucher program that entitled participants access to subsidized foods using Smart Cards. Among these households, 4.1 household members on average were registered in the food voucher program. This is consistent with national numbers for Egypt (Ecker et al. 2016).

Table 3.8. The role of pensions and social programs for household

	Mean / Percent	SD	N
Share of households where anyone received:			
Any pensions or social programs during the past 12 months (%)	33.9		2,246
Monthly amount received (per household, mean)	518.7*	341.3	762
Monthly amount received (per capita, mean)	125.5*	131.1	762
Share of households where:			
Any member has a Smart Card (%)	88.6		2,246
Number of members registered on the Smart Card (mean)	4.1	1.9	1,991

Source: Own estimation, based on farm household baseline survey data.
Note: *EGP reported

Key Findings

The demographic conditions among the farm households included in the farm household baseline survey can be summarized as follows:

- Demographic characteristics between the baseline survey and representative surveys (HIECS, DHS) are comparable, including the age of household head and number of women of reproductive age.[17]
- Households have relatively low levels of formal education; for example more than half of the mothers of children 0–5 years could not read at all, and only one-third were able to read fluently.
- Women play a very limited role in farming activities and decision-making and are mainly occupied in domestic activities.
- Housing conditions were adequate for most households, but sanitation and hygiene conditions were mixed for a sizeable proportion of the households. For example, more

[17] Considering only the five governorates where the study took place (Beni Suef, Menya, Luxor, Qena, and Sohag).

than 20 percent of the households had a dirt floor, and less than 10 percent of households treated drinking water.

- Most household possessed basic electronic appliances, but very few owned transportations means like cars or motorcycles. Ninety percent of households have cellphones, but internet ownership and ownership of higher-tech appliances like air conditioners, smartphones, and computers was low.

- Over one-third of households received income from social protection programs or pensions, representing approximately 23 percent of total per capita expenditures per month for these households. Also, most households (88.6 percent) have a Smart Card that gives access to an array of subsidized food and nonfood products.

C. Household Expenditure

In this chapter we analyze household expenditures on different goods and services, including food and nonfood. Estimates are disaggregated by household quintiles to assess how expenditure levels on different items compare across different household groups, both in absolute and relative terms.

Food Expenditure

Food constitutes 59.9 percent of total monthly expenditure among the surveyed farm households, which amounts to EGP 426.6 monthly per capita. Households purchase the majority of food on the market, whereas 19.6 percent of the value of food consumed on average come from own farm-produced food. The large majority of expenditure on food is for food consumed at home (93.4 percent), compared to only 6.6 percent that are spent on food consumed outside the household. On average, households spent EGP 28 per capita per month on outside-home foods (equivalent to 6.5 percent of total food expenditures).

Within different food categories, households on average spend the most on animal source food (37.6 percent), followed by cereals (13.2 percent), fats and oils (11.3 percent), vegetables (10.0 percent), fruits (6.1 percent) and sugar (6.0 percent). Subsidized food items made up 12.7 percent of monthly per capita food expenditures on average.

When comparing expenditures across household quintiles, one can observe an expected variation in terms of households' expenditure patterns. Household from the richest quintiles spent the equivalent of EGP 513.8 per capita per month (or 54 percent of total expenditure) on food, whereas those from the poorest household quintile spend EGP 377.3 per capita (or 66 percent of total expenditure) on food. Across all food items, there is a clear tendency that per capita expenditures in absolute terms (in EGP) increase from poorer to richer quintiles. For most food items there is much less variation in terms of their share in food consumption. For example, all household groups spend on average about 10 percent of consumption on vegetables and about 11 percent on fats and oils. Larger variation can be found for animal source food, where the share of consumption spend increases from poorer to richer quintiles; and for subsidized food where poorer households tend to spend a higher share of expenditure than the richer households.

Table 3.9. Per capita expenditure by items and quintiles

	Poorest quintile	2nd	3rd	4th	Richest quintile	All
	Mean	Mean	Mean	Mean	Mean	Mean
Food expenditures (EGP)	**377.3**	**392.8**	**414.2**	**435.1**	**513.8**	**426.6**
Food in total expenditure (%)	*66.5*	*63.3*	*60.9*	*59.5*	*53.6*	*59.9*
Food from own production (EGP)	79.0	75.1	76.2	75.8	111.4	83.5
Food from own prod. (% of total food cons.)	*20.9*	*19.1*	*18.4*	*17.4*	*21.7*	*19.6*
Food expenditures for food consumed at home (EGP)	345.0	363.1	385.2	410.1	490.6	398.8
Expenditure for food consumed at home (%)	*91.4*	*92.4*	*93.0*	*94.3*	*95.5*	*93.5*
Cereals (EGP)	51.5	51.0	53.6	55.6	69.5	56.2
Cereals (%)	*13.6*	*13.0*	*12.9*	*12.8*	*13.5*	*13.2*
Vegetables (EGP)	37.8	39.2	42.7	44.5	50.0	42.8
Vegetables (%)	*10.0*	*10.0*	*10.3*	*10.2*	*9.7*	*10.0*
Animal source foods (EGP)	138.2	147.3	152.2	162.8	200.9	160.3
Animal source foods (%)	*36.6*	*37.5*	*36.7*	*37.4*	*39.1*	*37.6*
Fruits (EGP)	25.5	25.1	25.2	24.8	29.8	26.2
Fruits (%)	*6.8*	*6.4*	*6.1*	*5.7*	*5.8*	*6.1*
Sugars (EGP)	21.3	23.1	24.6	27.8	31.4	25.6
Sugars (%)	*5.6*	*5.9*	*5.9*	*6.4*	*6.1*	*6.0*
Fats and oils (EGP)	42.6	44.3	46.5	49.6	57.6	48.1
Fats and oils (%)	*11.3*	*11.3*	*11.2*	*11.4*	*11.2*	*11.3*
Subsidized foods (EGP)	52.7	54.9	53.1	51.0	58.9	54.1
Subsidized foods (%)	*14.0*	*14.0*	*12.8*	*11.7*	*11.5*	*12.7*
Food consumed outside home (EGP)	33.2	29.7	29.1	25.0	23.2	28.0
Food consumed outside home (%)	*8.8*	*7.6*	*7.0*	*5.7*	*4.5*	*6.6*
Non-food expenditures (EGP)	**190.2**	**227.6**	**265.9**	**296.7**	**445.2**	**285.0**
Nonfood expenditure in total expenditure (%)	33.5	36.7	39.1	40.5	46.4	40.1
Total expenditure on food and non-food (EGP)	**567.5**	**620.4**	**680.1**	**731.8**	**959.0**	**711.6**

Source: Own estimation, based on farm household baseline survey data.

Nonfood Expenditure

Expenditures in nonfood goods complement the analysis of households' living standards, and for some categories, like healthcare, indicate if households devote resources to acquire goods that can contribute to improved health and nutrition (Gillespie et al. 2012). Total per capita nonfood expenditures represented 52 percent of total household expenditures on average (EGP 285), and the amount spent by the richest group in the sample was found to be EGP 445.2, compared to 190.2 of those in the poorest quintile. We selected four categories of expenditures: social events (weddings, funerals, and dowry), schooling (tuition fees, uniforms, books, and school supplies), healthcare (medicines, public and private hospitalization, pharmaceutic products, and health services in general), and energy (gas and electricity) for further discussion.

The highest cost from nonfood sources comes from healthcare expenditures. On average, households spent 20.0 percent of total nonfood expenditures on healthcare (EGP 57.1 monthly per capita). This burden was slightly higher for poorer households in relative terms, despite richer households spending significantly more than the poorest households (EGP 74.1 vs. 46.9 per capita, respectively). The second-highest source of nonfood expenditures was energy (incl. fuel and electricity), which accounted for 15.1 percent of nonfood expenditures for the average household in the sample. Similar to healthcare expenditures, poorer households spent a higher share on energy than richer households. For example, the average household in the first quintile spent the equivalent of 20.6 percent of total nonfood expenditures, whereas, those at the top quintile allotted only 10.5 percent. Average expenses per capita for schooling were EGP 22.7 monthly, or 8.0 percent of total nonfood expenses. A relatively modest 2.0 percent of nonfood expenditures was spent on social events, whereas this share increases to 5.1 percent for the richest quintile.

Table 3.10. Per capita monthly expenditure by expenditure quintile

	Poorest quintile	2nd	3rd	4th	Richest quintile	All
	Mean	Mean	Mean	Mean	Mean	Mean
Total Non-Food expenditures (EGP)	**190.2**	**227.6**	**265.9**	**296.7**	**445.2**	**285.0**
Social events (EGP)	0.7	2.6	4.1	5.2	22.5	7.0
Social events(%)	*0.4*	*1.1*	*1.5*	*1.8*	*5.1*	*2.5*
Schooling (EGP)	6.4	11.9	16.6	28.6	50	22.7
Schooling (%)	*3.4*	*5.2*	*6.2*	*9.6*	*11.2*	*8.0*
Healthcare (EGP)	46.9	52.4	51.7	60.2	74.1	57.1
Healthcare (%)	*24.7*	*23.0*	*19.4*	*20.3*	*16.6*	*20.0*
Energy (EGP)	39.2	41.9	44.3	43.1	46.8	43.1
Energy (%)	*20.6*	*18.4*	*16.7*	*14.5*	*10.5*	*15.1*
Other non-food expenditure	97	118.8	149.2	159.6	251.8	155.1
Other non-food expenditure (%)	*51.0*	*52.2*	*56.1*	*53.8*	*56.6*	*54.4*

Source: Own representation, based on farm household baseline survey.

Key Findings

The household expenditure characteristics among the households included in the farm household baseline survey can be summarized as follows:

- Farm households spend 59.9 percent of consumption on food on average, and those at the bottom quintile devoted 66.5 percent.
- Households purchase the majority of food on the market, whereas 19.6 percent of the value of food consumed on average come from own farm-produced food.

- Within different food categories, households on average spend the most on animal source food, followed by cereals, fats and oils, vegetables, fruits and sugar.
- Per capita expenditures of cereals, sugary foods and fats is substantially higher among higher expenditure quintiles compared to households in poorer quintiles.
- Expenditures on energy and healthcare constitute the largest nonfood share of household expenditures. Healthcare made up 20 percent of total nonfood household expenditures, and energy about 15 percent.
- Poor households spend more on healthcare and energy (in relative terms) than richer ones, as richer households spend a higher share on education and social events.

D. Agriculture

The following analysis describes agricultural assets and livestock ownership; farmland and field characteristics; and—by season—production, harvest, and marketing and input use for the most commonly cultivated crops among the interviewed farmers. Wherever possible, estimates derived from the farm household baseline survey are compared to estimates from other sources to contextualize the analytical results. It should be noted that there has been no (recent) agricultural census or household survey with thorough agricultural modules in Egypt. All available, nationally and regionally representative estimates are taken from official statistics, such as from the Ministry of Agriculture and Land Reclamation (MOALR), or household surveys, such as the Egyptian Labor Market Panel Survey (ELMPS), that are not designed to collect detailed agricultural data. Therefore, all quoted estimates from existing sources need to be interpreted cautiously.

Agricultural Assets and Livestock Ownership

Ownership of large agricultural assets, such as tractors, is low among the sampled horticultural farm households, but access is nearly universal. Table 3.11 shows that less than 10 percent of the farmers own a tractor. Almost all farmers who need a tractor or tractor service report to receive it at the time of need and pay for it (98.8 percent); few farmers get it free of charge from neighbors, friends, or relatives. In almost three-fourths of all cases (73.3 percent), the lender (or contractor) of the tractor (service) is a private entrepreneur; in all other cases, the lender is a neighbor, friend, or relative demanding payment for tractor service. Farmer associations (and agricultural cooperatives) do not seem to provide tractor services, or at least none of the interviewed farmers rented from these organizations.

Smaller key horticultural assets, such as hand sprayers (for pesticide application), are owned by more than one-third of the interviewed farm households (36.3 percent). Similar to tractors, if hand sprayers are needed, almost all non-owning farmers (96.8 percent) rent them for pay, and mostly from private lenders (69.3 percent) or neighbors, friends, or relatives—not from associations.

In Upper Egypt where agricultural land is fully irrigated, (diesel-powered) water pumps are vital for agricultural production. Most farmers (70.7 percent) own their pumps; all others who need water pumped into their fields pay for the service. The vast majority of farmers use traditional flood irrigation. Less than 2 percent of farmers have drip irrigation systems, which are highly water efficient and well suited for most horticultural systems.

Table 3.11. Access to key agricultural assets

	Ownership		Renting (if needed)		Private lender	
	Percent	N	Percent	N	Percent	N
Tractor	9.2	2,246	98.8	2,015	73.3	2,008
Hand sprayer	36.3	2,246	96.8	1,337	69.3	1,328
Water pump	70.7	2,246	95.4	631	60.3	630
Drip irrigation	1.8	2,246	34.1	138	85.1	47

Source: Own estimation, based on farm household baseline survey data.

Besides farming, most interviewed farmers raise livestock, which indicates a diversified farming system. Table 3.12 shows that almost four out five farmers (78.5 percent) hold poultry (mostly chicken), with 19.2 animals on average. Even large livestock (mostly cattle, donkeys, and mules) are present in more than three-fourths of all farm households (75.8 percent), with 3.1 animals held on average. Medium-sized livestock (including sheep and goats) are less common. Still, more than one-third of all farm households (34.4 percent) have goats or sheep, with an average herd size of 4.6 animals. Ownership of medium and large livestock in the farm household sample of this study is much higher than in the ELMPS sample, used by Nin-Pratt et al. (2018). The authors find that only 9.2 percent of the farm households owns goats, and 6.6 percent own sheep. Among the large livestock, 21.7 percent of the farm households owns cattle, and 15.8 percent and 0.4 percent owns buffaloes and camels, respectively.

Table 3.12. Livestock ownership and number of owned animals

	Ownership		Number		
	Percent	N	Mean	SD	N
Poultry	78.5	2,246	19.2	13.2	1,764
Goats and sheep	34.4	2,246	4.6	4.4	773
Cattle, donkeys/mules, and other large animals [a]	75.8	2,246	3.1	2.2	1,703

Source: Own estimation, based on farm household baseline survey data.
Note: [a] Other large animals include horses and camels. No ownership of buffaloes was reported.

Farmland and Field Characteristics

Most interviewed farmers (85.7 percent) cultivated agricultural crops during both the summer season 2017 and the winter season 2017–18.[18] Most farmers who cultivated crops during only one season did so during the winter season (82.4 percent). These households may have newly entered farming during the (more recent) winter season by, for example, starting farms on reclaimed land in the dessert. Table 3.13 provides an overview of land usage by season for farmers that cultivated crops during the specific season.

[18] There are nine households that reported to have not cultivated agricultural crops in the summer season 2017 and the winter season 2017–18. These households were dropped from the sample.

Table 3.13. Farmland usage by season

	Summer season 2017 (N = 1,980)		Winter season 2017–18 (N = 2,182)	
	Mean	SD	Mean	SD
Total agricultural land (feddans)	2.30	2.88	2.24	2.69
Share of cultivated land on total land (%)	96.6	12.4	99.7	3.9
Share of harvested land on cultivated land (%)	94.3	17.8	62.8	40.8
Number of fields harvested	1.62	0.91	1.69	0.94
Agricultural land ratio: winter/summer season (N = 1,925)			1.07	0.71

Source: Own estimation, based on farm household baseline survey data.

The interviewed farmers on average hold 2.24–2.30 feddans of agricultural land, including cultivated land and fallow land. On the average farm, this land is aggregated or distributed over two fields. The agricultural land areas of farmers who cultivated during both seasons increased by an average of 7 percent between the summer season 2017 and the winter season 2017–18. These farmers may have taken over land from other farmers exiting or downscaling farming or expanded their farm sizes by adding new fields, such as on reclaimed land. Farmers cultivated almost all their farmland during the winter season (99.7 percent), and most of it also during the summer season (96.6 percent). The low average share of fallow land points to a very intensive farming system. However, it should be noted that, even if no crops are cultivated, most fields need to be irrigated to maintain soil quality and the irrigation channels and to prevent desertification of the land. At the time of the farm household baseline survey in April–May 2018, the farmers harvested 62.8 percent of their land cultivated during the winter season. Some farmers reported that they did not harvest all of their land cultivated during the summer season 2017. A possible explanation is that some fields were cultivated with perennial crops that did not (yet) produce harvests in that season.

Few cultivated fields are in the New Lands—land areas reclaimed from the desert—and most cultivated fields are in the Old Lands, located in the Nile Valley, where agricultural crops have been cultivated for thousands of years. Table 3.14 shows that a higher percentage of fields was in the New Lands in the winter season 2017–18 (19.6 percent) than in the summer season 2017 (14.0 percent). This reflects the aforementioned land expansion among the interviewed farmers. The average field size is 1.2–1.3 feddans. Fields in the New Lands are significantly larger than in the Old Lands.

The average farm size is much larger among the interviewed farmers, and the distribution of farm sizes is much wider than among the 2012 ELMPS farm household population, as defined by Nin-Pratt et al. (2018). According to Nin Pratt et al., the mean farm size is 1.26 feddans, with a standard deviation of 1.86. To some extent, this may be explained by the definition of farm households. Nin Pratt et al. includes a large proportion of households, whose main income sources are nonagricultural activities, unlike in the sample population of this study. Households that earn considerable shares of their income from nonagricultural activities tend to cultivate less agricultural land than full-time farm households.

Table 3.14. Characteristics of cultivated fields by season

	Summer season 2017 (N = 3,202)		Winter season 2017–18 (N = 3,678)	
	Mean	SD	Mean	SD
Field is …				
Located in New Lands (%)	14.0		19.6	
Owned by farming household (%)	69.2		67.8	
Rented by farming household (%)	29.3		30.1	
Prepared by hired tillage service (%)	93.3		90.9	
Irrigated by flooding (%)	99.6		99.3	
Irrigated by canal/river water (%)	79.2		75.4	
Field size (feddans)	1.22	1.37	1.29	1.59
Land rent per season (EGP/feddan) [a]	7,799	3,424	7,830	3,928
Costs of tillage service (EGP/feddan) [b]	541	397	553	330

Source: Own estimation, based on farm household baseline survey data.
Note: [a] Estimates are for rented fields in the summer season (N = 934) and the winter season (N = 1,083).
[b] Estimates are for fields prepared by hired tillage service in the summer season (N = 2,987) and the winter season (N = 3,345).

Somewhat more than two-thirds of all fields are owned by the interviewed farm households, and almost all other fields are rented for cash pay. Very few fields were cultivated under a sharecropping system, with only 1.5 percent (49 fields) in the summer season 2017 and 2.1 percent (76 fields) in the winter season 2017–18. Most of them are located in three districts (Samalot in Menya, Dar-el-Salam in Sohag, and Qeft in Qena). The common arrangement of sharecropping is that the farmer hands over half of the harvest to the field owner as lease. The land rent was about EGP 7,800 per feddan, with no real price differences between seasons. All farmers who did not own a tractor and tillage equipment hired a service for land preparation, which typically includes ploughing and field leveling. More than 90 percent of all cultivated fields were prepared by hired machinery services in both seasons. The average costs of this service were around EGP 550 per feddan. The slight seasonal differences in the average price of tillage service and, less so, in the average land rent are likely due to general price inflation.

Modern, water-saving irrigation technology, such as drip irrigation or sprinkler systems, is virtually absent among the interviewed farmers. More than 99 percent of all fields were irrigated by flooding. Somewhat more than three-fourths of all fields were irrigated with water taken from irrigation canals fed by the Nile or directly from the Nile and tributaries. The proportion of fields irrigated with water taken from boreholes and wells was higher during the winter season 2017–18 (24.2 percent) than the summer season 2017 (20.5 percent). This can be explained by the larger numbers of fields in the New Lands that were cultivated in the winter season. Several of the reclaimed land areas in the desert are irrigated by fossil water from natural underground reservoirs. Farmers follow a strict irrigation schedule that varies between seasons and across plant-growing stages depending on the cultivated crops, evaporation, and water storage capacity of the soil. Table 3.15 shows that, during the crop planting period, 30–40 percent of all fields was irrigated at least once per day, and another 30–40 percent was irrigated every 6–10 days.

Table 3.15. Field irrigation frequency during the planting period by season

	Summer season 2017 (N = 3,202)	Winter season 2017–18 (N = 3,678)
At least once per day (%)	31.4	38.5
Every 2–5 days (%)	8.5	6.5
Every 6–10 days (%)	40.3	32.3
Less frequent (%)	19.9	22.7

Source: Own estimation, based on farm household baseline survey data.

Production, Harvest, and Marketing

Most interviewed farmers produced cereals in the main and complement cereal production with the production of vegetables, roots, and tubers; herbs and spices; or fodder and other seasonal nonfood crops. Few farmers produced pulses and seeds, with peanuts being the most produced crop in this group. Very few farmers produced fruits, and if so, they cultivated perennial fruit crops (such as tangerines, table grapes, and bananas). Table 3.16 shows that 88.0 percent of all farmers produced cereals in the summer season 2017, which was almost exclusively maize. In the winter season 2017–18, cereals were produced by 67.8 percent of the farmers; almost all of them produced winter wheat. These farmers planted cereals on nearly 80 percent of their cultivated area in the summer season, and on about 60 percent in the winter season.

Table 3.16 also confirms that the winter season is the main season to produce vegetables (including roots and tubers), herbs and spices, and fodder and other seasonal nonfood crops. Vegetables were cultivated by about one-fourth and one-third of all farmers in the summer season 2017 and the winter season 2017–18 (25.2 percent and 33.7 percent), respectively. Vegetable farmers allocated roughly half of their cultivation area to vegetables, with a somewhat larger share in the winter season than in the summer season. The most common vegetables are green beans, onions, potatoes, and tomatoes, while only green beans were cultivated during the summer season by a considerable number of farmers (that is, at least 2 percent of all interviewed farmers). Green beans were cultivated by more farmers in the summer season than in the winter season.

About 20 percent of all interviewed farmers cultivated herbs and spices in the winter season 2017–18, and about 10 percent in the summer season 2017. The most commonly cultivated herbs and spices were basil, fennel, marjoram, and garlic. Only basil was cultivated in the summer season 2017, and by more farmers than in the winter season 2017–18. Herb and spice farmers planted these crops on about 65 percent of their cultivation area in the summer season 2017 and the winter season 2017–18.

Table 3.16. Production patterns for common crops by season

	Proportion of farmers (%)		Cultivated area (feddans)						Share of crop-cultivated area in total cultivated area (%)	
	SS 2017 (N = 1,980)	WS 2017–18 (N = 2,182)	SS 2017			WS 2017–18			SS 2017	WS 2017–18
	Mean	Mean	Mean	SD	N	Mean	SD	N	Mean	Mean
Cereals	*88.0*	*67.8*	*1.5*	*2.1*	*1,742*	*1.2*	*1.6*	*1,480*	*79.2*	*60.2*
Maize	87.6	2.0	1.5	2.0	1,735	1.1	1.5	44	79.3	46.4
Wheat		66.9				1.2	1.6	1,459		59.6
Vegetables, roots, & tubers	*25.2*	*33.7*	*0.9*	*0.9*	*498*	*1.4*	*2.2*	*736*	*48.5*	*55.9*
Green beans	17.8	7.7	0.9	0.8	352	1.1	0.9	168	49.2	48.5
Onions		19.8				1.2	1.5	432		45.4
Potatoes		6.1				1.4	1.7	133		44.0
Tomatoes		4.4				1.3	2.2	97		51.9
Herbs & spices	*9.8*	*20.2*	*1.6*	*1.4*	*195*	*1.7*	*1.8*	*441*	*65.6*	*64.5*
Basil	7.4	2.0	1.3	1.0	147	0.9	0.7	43	58.0	43.2
Fennel		6.3				2.1	2.2	137		67.8
Marjoram		5.7				1.7	1.3	124		60.2
Garlic		5.1				0.7	0.5	111		40.6
Pulses & seeds	*3.4*	*1.3*	*1.0*	*1.0*	*67*				*41.7*	
Peanuts	2.1		1.0	0.8	41				45.2	
Fruit trees	*0.5*	*0.3*								
Fodder & other nonfood crops	*19.7*	*55.8*	*1.1*	*1.2*	*391*	*0.9*	*0.9*	*1,218*	*50.5*	*48.0*
Clover	10.3	49.3	0.8	0.9	203	0.7	0.6	1,075	46.4	42.9
Sugar beets		2.2				1.6	1.6	49		44.2

Source: Own estimation, based on farm household baseline survey data.

Note: Crops are included if they are cultivated by at least 2 percent of all farmers by season. This is equivalent to at least 40 household observations per season; Crop and crop group estimates are reported if they are based on at least 40 household observations; SS = summer season; WS = winter season.

Fodder and other seasonal nonfood crops were cultivated by more than half of all interviewed farmers in the winter season 2017–18 (55.8 percent), and about one-fifth in the summer season 2017 (19.7 percent). The most common crops of this crop group were clover and sugar beets. Because of the lack of grassland, clover is produced as feed for medium and large livestock. Farmers that cultivate fodder and other seasonal nonfood crops reserved about half of their cultivation area for producing these crops during both the summer and winter season.

Table 3.17 reports the yields of the most commonly cultivated crops (if a sufficient number of observations are available). In addition to means, medians are reported, because they provide better average estimates for skewed distributions (resulting from outliers, for example).[19] Mean and median yields are close for all crops, except for basil. For green beans, both the ratio of seasonal means and the ratio of seasonal medians suggest that yields of the winter season 2017–18 exceeded yields of the summer season 2017–18 by around 67 percent.

The shares of harvested quantities sold, shown in Table 3.17, suggest that farmers cultivate crops largely for commercial purposes and keep only small shares of the harvest for their own consumption. The low-marketed shares for maize and wheat need to be interpreted cautiously. Cereals can be stored and sold several months after the harvest to fetch higher prices. Moreover, at the time of the farm household baseline survey, the wheat harvest was not completed in the survey area. Among the common vegetables and herbs and spices, the lowest marketed share occurred for onions, at 70.0 percent. The shares of harvest sold range between around 83 percent for green beans and 98 percent for marjoram. Altogether, these estimates indicate a very high level of commercialization in horticulture among the sampled farmers.

Comparable yield data are limited, and available data sources need to be interpreted very cautiously. The MOALR provides average crop-based estimates of total harvest quantity total cultivation area by season and governorate for the agricultural year 2013–14 (MOALR 2015). Table 8.8 shows the cultivation area and harvest quantity estimates for the governorates where the farm household baseline survey was conducted. It also shows average yields derived from these estimates. Beyond the derived yields being rough estimates, the comparability of these average yields with average yields derived from the farm household baseline survey is somewhat limited, because the MOALR data also include very large agricultural farms, using modern agricultural inputs and technologies including ‘precision farming,’ sprinkler and drip irrigation systems, and greenhouses for vegetable and herb and spice production. Hence, it should be expected that average yields reported by MOALR exceeds average yields derived from the farm household baseline survey.

[19] Extreme values were dropped from the sample during data cleaning.

Table 3.17. Harvest yields and marketing of common crops by season

	Yield (tons/feddan)								Share of harvest sold (%)					
	Summer season 2017				Winter season 2017–18				Summer season 2017			Winter season 2017–18		
	Mean	SD	Median	N	Mean	SD	Median	N	Mean	SD	N	Mean	SD	N
Maize	1.9	1.4	1.7	1,624					28.8	37.3	1,679			
Wheat					1.8	1.0	1.8	670				16.0	31.3	670
Green beans	2.7	2.0	2.4	253	4.5	2.0	4.0	161	82.8	36.3	253	83.8	33.3	161
Onions					12.4	4.8	12.0	373				70.0	41.6	373
Potatoes					11.6	4.6	11.1	126				94.8	14.3	126
Tomatoes					12.8	8.0	12.0	87				96.0	5.5	90
Basil	7.3	10.4	2.0	141					98.0	14.2	147			
Marjoram					1.7	0.8	1.7	26				76.9	43.0	26
Garlic					6.6	3.9	6.0	110				83.9	32.0	110
Peanut	0.7	0.4	0.7	41					93.8	21.9	41			
Sugar beets					30.3	8.2	30.0	21				100.0	0.0	25

Source: Own estimation, based on farm household baseline survey data.

Note: Crops are included, if they are cultivated by at least 2 percent of all farmers by season. This is equivalent to at least 40 household observations per season. Crop estimates are reported, if they are based on at least 20 household observations.

Comparison between yields in Tables 8.7 and 8.8 confirm this general tendency. All yields reported in Table 8.8 are considerably higher, except for potatoes and sugar beets. The yields from both sources appear to be in a reasonable range. Exceptions are the basil and marjoram yields, which are much higher in the MOALR data. The MOALR-reported average basil yield of 17.6 tons per feddan may be questionable. Leaf yields range from 6 to 10 tons per acre of fresh material in North Carolina, USA, and South Africa (NC State Extension 1997; DAFF 2012). Average marjoram yields of 20.4 tons per feddan, as reported by MOALR, appear to be grossly overestimated, too. The reported average marjoram yield per season considerably exceeds the reported yields of tomatoes and onions, for example, and that of wheat by 6.7-fold. Nevertheless, it should be also noted that the marjoram harvest was not completed at the time of the farm household baseline survey, which implies that the average yield report in Table 3.17 likely underrates the average seasonal yield.

Table 3.19 shows that most common crops are harvested in one batch. Exceptions are basil and tomatoes. Most farmers picked basil three times to complete the 2017 summer season harvest. At the time of the farm baseline survey implementation, tomatoes were harvested two to three times during the winter season 2017–18, on average. The number of tomato-harvest batch observations in Table 3.19 is lower than the number of tomato farmer observations in Table 3.16. This suggest that, at the time of the survey, the tomato harvest was not completed in all sample villages. It explains the considerable difference between the mean and median of tomato harvest batches. Clover is often cut for fresh fodder as needed. Farmers cut clover four times per season on average.

Farmers sell most of their harvest to a single buyer, such as a trader or processor. Table 3.20 shows that a single buyer was the purchaser of most harvest batches of marketed products in the summer season 2017 and the winter season 2017–18. Less than 5 percent of all marketed batches were sold directly to the end consumers in local markets. Additionally, most harvest batches were sold all at once—not sold in different charges to several buyers. These marketing patterns suggest that the interviewed farmers are well integrated in specialized value chains for (most of) the cultivated crops. Most farmers reported that they did not have any issues with the buyers of their harvested batches (88.5 percent in the summer season 2017 and 85.1 percent in the winter season 2017–18). Yet, in the case of 11.1 percent of all marketed batches of the summer season harvest and 13.9 percent of all marketed batches of the winter season (at the time of the farm household baseline survey), the farmer reported that he received the payment delayed or not in time.

Table 3.18. Governorate-average yields in 2013–14 by season

	Summer season 2017				Winter season 2017–18			
	Total production quantity (tons)	Total cultivated area (feddans)	Average yield (tons/feddan)	Governorates (N)	Total production quantity (tons)	Total cultivated area (feddans)	Average yield (tons/feddan)	Governorates (N)
Maize	2,112,986	699,580	3.0	5				
Wheat					2,010,312	736,013	2.7	5
Green beans	1,753	262	6.7	3				
Onions					512,205	34,235	15.0	5
Potatoes	645,766	64,832	10.0	5				
Tomatoes	373,416	20,362	18.3	5	154,742	8,625	17.9	1
Basil	59,217	3,374	17.6	2				
Marjoram	9,352	458	20.4	2				
Garlic								
Peanuts	12,924	9,801	1.3	5				
Sugar beets					1,525,815	56,504	27.0	2

Source: Own calculation, based on data from MOALR (2015).

Note: The number of observations (N) refers to the number of governorates (Beni Suef, Luxor, Menya, Qena, Sohag) that provided crop estimates. Blank cells indicate that data are not available.

Table 3.19. Batches of harvest of common crops by season

	Number of batches harvested							
	Summer season 2017				Winter season 2017–18			
	Mean	SD	Median	N	Mean	SD	Median	N
Maize	1.3	1.1	1.0	2,608				
Wheat					1.0	0.2	1.0	764
Green beans	1.0	0.0	1.0	305	1.1	0.8	1.0	185
Onions					1.0	0.0	1.0	407
Potatoes					1.0	0.0	1.0	158
Tomatoes					2.3	2.2	1.0	92
Basil	2.7	1.5	3.0	145				
Marjoram					1.0	0.2	1.0	28
Garlic					1.0	0.0	1.0	120
Peanut	1.0	0.0	1.0	41				
Clover	4.1	1.1	4.0	96	4.3	1.0	4.0	1,024
Sugar beets					1.0	0.0	1.0	25

Source: Own estimation, based on farm household baseline survey data.
Note: Crops are included if they are cultivated by at least 2 percent of all farmers by season. This is equivalent to at least 40 household observations per season. Crop estimates are reported if they are based on at least 20 household observations.
The number of observations (N) refers to the number of batches harvested. For maize and wheat, standard deviations (SDs) not equal to zero are likely due to misreporting.

Table 3.20. Marketing of harvest batches for all marketed crops by season

	Summer season 2017 (N = 2,202)	Winter season 2017–18 (N = 1,635)
	Percent	Percent
Single buyer (trader or processor)	89.2	85.8
Consumer in local market	3.4	4.5
Other buyers	1.2	3.1
Several buyers of different type	6.1	6.5

Source: Own estimation, based on farm household baseline survey data.
Note: The number of observations (N) refers to the number of batches harvested and marketed. The lower number of observations during the winter season than the summer season indicates that the winter season harvest was not completed for all cultivated crops at the time of the farm household baseline survey.

Input Use

Patterns of input use suggest that the interviewed farmers practice highly intensive farming. Table 3.21 shows that synthetic fertilizer usage was nearly universal on the most commonly cultivated crops in the summer season 2017 and the winter season 2017–18. In the winter season—the main horticulture season, every single farmer applied synthetic fertilizer on the most common vegetables and herbs and spices (except for garlic). The most common synthetic fertilizers are urea (or azote) and nitrate, which are available to government-supported farmers at subsidized prices from agricultural cooperatives (Table 3.22). These nitrogen compound fertilizers are also available at higher prices in the local market. Given widespread ownership of medium and large livestock among the interviewed farmers, manure is commonly used to fertilize fields, in addition to synthetic fertilizer.

Pesticide use is also very common, especially in vegetable production. About 80 percent of farmers sprayed their green beans in the summer season 2017,[20] and around 90 percent of farmers applied pesticides to onions and tomatoes in the winter season 2017–18. Among the herbs and spices, pesticide application is most common for garlic and basil, while the relatively low application rate for fennel and marjoram production may be partly due to the fact that the harvest was not completed in all surveyed villages at the time of the farm household baseline survey. Among the different types of pesticides, insecticides are most commonly used (Table 3.23). The most common insecticides are Lambda, Malathion, and Lannate, which are also common products outside Egypt.

Most farmers hire farm workers or agricultural machinery services to conduct specific tasks during crop production, such as for planting, weeding, spraying, or harvesting, in addition to land preparation (as discussed above). Especially in the production of vegetables and herbs and spices that are harvested all at once, including green beans, onions, marjoram, and garlic, around 90–97 percent of all interviewed farmers hired farm workers (or agricultural machinery services) during the summer season 2017 and winter season 2017–18 (Table 3.20). These workers were likely harvest hands in most cases. Outsourcing of farm labor is also very common for wheat and maize production. This is likely due to hiring agricultural machinery services, given the low level of ownership of tractors and heavy machinery such as tractor-mounted seeders, sprayers, fertilizer spreaders, and combined harvesters.

[20] The substantially lower prevalence of pesticide application in the winter season 2017–18 than in the summer season 2017 is somewhat surprising and may require further investigation.

Table 3.21. Input use in the production of common crops by season

	Proportion of farmers using the following inputs (%)						Observations (N)	
	Synthetic fertilizer		Pesticides		Hired workers			
	SS 2017	WS 2017–18	SS 2017	WS 2017–18	SS 2017	WS 2017–18	SS 2017	WS 2017–18
Maize	99.2	90.9	42.5	34.1	80.2	72.7	1,735	44
Wheat		99.7		44.2		83.8		1,459
Green beans	99.4	100.0	79.8	26.8	95.2	95.8	352	168
Onions		100.0		88.2		92.4		432
Potatoes		100.0		69.9		97.0		133
Tomatoes		100.0		91.8		76.3		97
Basil	99.3	100.0	46.9	67.4	94.6	100.0	147	43
Fennel		100.0		25.5		69.3		137
Marjoram		100.0		59.7		92.7		124
Garlic		99.1		76.6		89.2		111
Peanuts	100.0		31.7		75.6		41	
Clover	96.1	94.2	18.2	17.9	24.1	35.3	203	1,075
Sugar beets		100.0		24.5		85.7		49

Source: Own estimation, based on farm household baseline survey data.

Note: Crops are included, if they are cultivated by at least 2 percent of all farmers by season. This is equivalent to at least 40 household observations per season. Crop estimates are reported, if they are based on at least 40 household observations.

The number of observations (N) refers to the number of farmers producing the specified crop.

SS = summer season; WS = winter season.

Table 3.22. Applied fertilizers

	Percent
Urea/azote, subsidized	15.4
Urea/azote	23.4
Nitrate, subsidized	7.4
Nitrate	14.3
Super sulfate	18.7
Other synthetic fertilizers	5.1
Manure	15.8

Source: Own estimation, based on farm household baseline survey data.
Note: N = 8,050. The number of observations (N) denote the application of the fertilizers (as specified in the farm household baseline survey) on any field in the summer season 2017 or the winter season 2017–18.

Table 3.23. Applied pesticides

	Percent
Lambda (insecticide)	19.0
Malathion (insecticide)	14.0
Lannate (insecticide)	7.2
Ridomil (fungicide)	8.4
Other pesticides	51.4

Source: Own estimation, based on farm household baseline survey data.
Note: N = 3,077. The number of observations (N) denote the application of the pesticides (as specified in the farm household baseline survey) on any field in the summer season 2017 or the winter season 2017–18.

Key Findings

In summary, the agricultural conditions among the farm households included in the farm household baseline survey are characterized as follows:

- The sample-average farm size is larger than the average farm size in Upper Egypt, and the distribution of farm sizes is wider than in the total farm household population in Upper Egypt.
- The levels of agricultural asset and livestock ownership are larger than those of other farmers in Upper Egypt, implying that the sampled farm households are likely to be better-off.
- Nearly all farms hire farm workers and agricultural machinery services that appear to be economically reasonable, given peaks in manual labor needs (e.g., during harvest of vegetables and herbs and spices) and low levels of machinery ownership (associated with small farm sizes).

- Most farms are diversified, complementing cereal production by cultivating vegetables, herbs and spices, and fodder crops; raising medium and large livestock; and keeping poultry.
- The practiced farming system is very intensive, with very little fallow land, nearly universal use of synthetic fertilizer, and widespread usage of pesticides on all common crops.
- Yields of common crops are mostly lower but within a reasonable range of average yields reported for Upper Egypt that appear to be biased by very large, high-intensity farms.
- Nearly all farms are highly commercialized and integrated in specialized value chains, and small shares of the harvest are kept for own consumption.

This chapter also highlighted the general lack of comprehensive and reliable agricultural data in Egypt. As such, the conducted farm household baseline survey presented in this report makes an important, fundamental contribution to evidence-based agricultural policymaking and program design.

E. Health and Nutrition Knowledge

This chapter describes maternal knowledge across a wide range of nutrition and health domains. Adequate nutrition and health knowledge is a necessary (but not sufficient) condition to improve health and nutrition outcomes.

Hygiene Knowledge

When asked when hands should be washed, women listed an average of nearly three activities (Table 3.24). Washing hands after using the bathroom was mentioned by 58.0 percent of the respondents. Other key moments to wash hands (such as before feeding a child or after cleaning children's bowel movements) were mentioned by only a small proportion of women. Meanwhile, all respondents mentioned at least one type of soap as something to be used for washing hands.

Table 3.24. Hygiene knowledge of mothers/caretakers

	Percent / Mean ± SD
Handwashing practices	
Before meals	85.1
After using the bathroom	58.0
Before feeding a child	33.0
After cleaning children's bowel movements	27.1
Before food preparation tasks	42.9
After coming from the farm	12.4
After handling animals	15.3
After meal eating	10.9
Handwashing number of practices mentioned (Mean ± SD)	2.8 ± 1.2
Handwashing products mentioned	
Soap	93.1
Powder detergent	26.0
Liquid soap	32.4
Ashes	3.2
Sand/mud	0.9
Dettol	2.4
Mentioned at least one type of soap (soap, powder detergent, or liquid soap)	100.0

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 1,817 to 1,908.

Knowledge Related to Healthy Eating

When asked about the composition of a healthy food diet, 88.5 percent of women could list at least one food group necessary for a healthy diet. In addition, 94.0 percent could list at least one source of fats (Table 3.25).

Women's knowledge on which specific foods provide certain nutrients varied. For iron-rich food, close to half of the women (46.8 percent) mentioned liver, and 29.7 percent mentioned meat, chicken, and fish. Meanwhile, women mentioned other plant-based foods as a source of iron, with high mentions of eggplants and molasses. Out of 10 women, nine could list examples of starches, with the majority identifying cereals; six could identify eggs, fish, chicken, beef, and milk as sources of protein; seven could list at least one plant-based source of protein. The most commonly mentioned type of plant-based protein was fava beans (54.5 percent), which is a staple crop in Egypt. With respect to the benefits of fruits and vegetables, 79.1 percent were able to mention at least one benefit, with more than half mentioning that it is a source of vitamins (Table 3.25).

When asked how to maintain a healthy body weight, answers were mostly related to eating healthy foods and maintaining a balanced diet (72.8 percent) and eating fruits and vegetables (65.4 percent) (Table 3.26). Only one-third mentioned reducing sugar or soft-drink intake (33.2 percent), and very few mentioned the role of physical exercise (12.5 percent) or watching TV and playing electronic games (1.9 percent) (Table 3.26).

More than half of the women had correct views on each of the questions asked with respect to how diet affects health: over 90.0 percent agreed that eating fruits and vegetables daily is good for health and that consuming a lot of sugar is bad for one's teeth. A similar percentage agreed that consuming lots of sugar (84.4 percent) and lots of fats and oil (86.5 percent) can make one fat. Yet, only around half of the women (55.1 percent) agreed or gave a neutral response to the statement that one does not have to worry about the kind of foods one eats (Table 3.26).

Table 3.25. Nutrition knowledge of mothers/caretakers

	Percent
Healthy diet	
Mentioned at least one food group	88.5
Can list at least one source of fats	94.0
Iron-rich food	
Meat, poultry, and fish	29.7
Liver	46.8
Starches	
Cereals	75.2
Potatoes	65.6
Sweet potatoes	11.6
Mentioned at least one type of food rich in starch	90.4
Protein-rich food	
Knows that animal-source foods provide protein to the diet	62.6
Plant-based protein-rich food	
Fava beans	54.5
Beans (red, white, black)	20.3
Lentils	48.7
Chickpeas	16.9
Cowpeas	13.7
Peanuts	4.7
Mentioned at least one type plant-based food rich in protein	71.2
Benefits of fruits and vegetables	
Source of vitamins	55.9
Source of minerals	40.0
Source of fiber	6.9
Source of antioxidants	1.7
Mentioned at least one benefit	79.1

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 1,817 to 1,908.

Table 3.26. Health knowledge of mothers/caretakers

	Percent / Mean ± SD
Achieving a healthy weight	
Eat healthy foods/balanced diet	72.8
Eat fruits and vegetables	65.4
Minimize sugar and soft drink consumption	33.2
Minimize processed food intake	13.2
Regular physical exercise	12.5
Minimize watching TV or playing electronic games	1.9
Views on health and sugar consumption	
Disagrees with "I do not have to worry about the kind of foods to eat"	55.1
Knows that "eating fruit and vegetables daily is good for your health" is correct	94.0
Knows that "eating too much fat and oil can make you fat" is correct	86.5
Knows that "consuming lots of sugars is good for your health" is incorrect	68.3
Knows that "consuming lots of sugars can make you fat" is correct	84.4
Knows that "consuming lots of sugars is bad for your teeth" is correct	91.1
Sum correct views on all (out of 5) (Mean ± SD)	4.2 ± 1.1

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 1,817 to 1,908.

Maternal and Child Health Knowledge

Of those surveyed, 97.8 percent of women could list at least two pregnancy danger signs, with 77.4 percent mentioning vaginal bleeding, and 59.4 percent mentioning abdominal pain (Table 3.27). Meanwhile, facing difficulty seeing or breathing were mentioned by fewer than 14 percent.

For signs of child illness for which a child should be taken to a medical facility right away, 79.9 percent of women could list two signs. Some key danger signs, such as breathing issues or bloody stools, were mentioned by fewer than 30 percent of the respondents (Table 3.27).

All women believed that colostrum should be fed to the newborn, but, interestingly, only 57.6 percent of women thought that children should be fed immediately. The main reasons mentioned for feeding colostrum were related to the newborn's health (71.5 percent) and immunity (60.6 percent).

Notwithstanding the low levels of exclusive breastfeeding (Table 3.28), a large number of women knew about the advantages of exclusive breastfeeding: protecting the baby from diseases was mentioned by 76.1 percent of women, helping the baby's growth by 56.4 percent, and breast milk being a complete food by 43.8 percent.

Table 3.27. Health knowledge of mothers/caretaker: Danger signs of pregnancy and child illness

	Percent
Pregnancy dangers	
Vaginal bleeding	77.4
Vaginal discharge	32.9
High fever	42.4
Abdominal pain	59.4
Severe and persistent headache	28.8
Vision trouble	12.8
Difficulty breathing	13.2
Swollen body/face/hands	30.0
No fetal movement/changes in fetal movement	28.4
Could name at least 2 pregnancy danger signs	97.8
Danger signs of child illness	
Cannot drink or breastfeed	58.2
Getting sicker	44.0
Running a fever	61.9
Breathing fast	30.9
Trouble breathing	22.5
Bloody stools	11.7
Could name at least 2 child danger signs	79.9

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 955 to 961.

Knowledge about the correct age at which children should be introduced to liquids and foods other than breast milk was limited: the correct age of six months was mentioned by only 39.2 percent of women when it comes to introducing liquids, and by 49.5 percent of women for the introduction of solid or semisolid foods (Table 3.28).

For children above six months of age, 76.3 percent of women mentioned that it is important for a child to consume other foods besides breast milk, because at this age breast milk does not provide the baby with the necessary nutrients. Furthermore, 44.3 percent mentioned that it does not contain enough energy, and 16.2 percent mentioned that the baby cannot develop appropriately without other food.

Table 3.28. Health knowledge of mothers/caretaker: Children's nutrition

	Percent
Breastfeeding colostrum	
Breastfeed right away	57.6
Should breastfeed colostrum?	99.4
Improves baby's health	71.5
Makes him/her more immune to diseases	60.6
Contains nutrients/helps children's growth	28.3
Helps baby have bowel movement (laxative)	10.4
Reasons for exclusive breastfeeding below 6 months of age	
Protect baby from diseases	76.1
Help baby's growth	56.4
Complete food during first 6 months	43.8
Less risk of pregnancy for mother	17.0
Postponement of period for mother	11.2
Breast milk is healthy and pure	22.0
Free	6.6
Reduction of medical costs	1.7
Age of introducing foods and drinks other than breast milk	
Age for introducing any liquids is 6 months	39.2
Age for introducing any food is 6 months	49.5
Reason for introducing food starting at 6 months	
Breast milk does not provide necessary nutrients	76.3
Breast milk does not contain enough energy	44.3
Cannot develop appropriately w/o other foods	16.2

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 955 to 961.

When asked about the reasons or circumstances under which a child should receive oral rehydration solution (ORS), 98.3 percent of women mentioned diarrhea. Knowledge about preventing diarrhea, however, was limited. Even though around 84.1 percent of women could list at least two preventive measures, and women mentioned on average nearly three measures, key practices like using clean water, washing hands, and food safety were mentioned by no more than 50–60 percent of all women (Table 3.29). Knowledge about what to do when a child is suffering from diarrhea was limited too. Women mentioned on average nearly two practices, and only around half mentioned critical practices such as providing ORS and ensuring sufficient liquid intake.

Table 3.29. Health knowledge of mothers/caretaker: Diarrhea

	Percent / Mean ± SD
Diarrhea	
Child should take oral rehydration solution (ORS) for diarrhea	98.3
Diarrhea prevention	
Using clean water	52.0
Washing hands	51.4
Making sure food is clean	57.6
Cooking food well before presentation	30.9
Disposing all types of waste safely	19.3
Controlling/fighting flies	20.1
Breastfeeding	19.8
Improving feeding practices	11.2
Measles vaccination	7.7
Number of practices mentioned for preventing diarrhea (Mean ± SD)	2.8 ± 1.4
Could name at least 2 methods to prevent diarrhea	84.1
Actions for children's diarrhea	
Continue breastfeeding newborns	32.2
Provide the baby fluids frequently	51.3
Provide easily digestible food	29.9
Give the child an ORS	53.2
No medicines unless doctor consulted	14.7
Number of practices mentioned (Mean ± SD)	1.8 ± 0.8
Could name at least 2 practices to do for child suffering diarrhea	60.1

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 955 to 961.

Women had different perceptions on the effects of poor nutrition on children. When asked about the potential effects of poor nutrition on children's health, 63.2 percent of women mentioned fatigue. Anemia and wasting were mentioned by 58.9 percent and 58.3 percent of women, respectively. Meanwhile, only 10.4 percent and 12.1 percent mentioned stunting and rickets, respectively (Table 3.30).

The most frequently mentioned effect of poor nutrition on children's health was anemia, but few women were aware of its consequences. Impaired development, fatigue, and dizziness were stated by 30–40 percent of women, while all other consequences were mentioned less frequently.

Table 3.30. Health knowledge of mothers/caretaker: Children's heath

	Percent
Effect of poor nutrition on child	
Wasting	58.3
Stunting	10.4
Rickets	12.1
Anemia	58.9
Fatigue	63.2
Frequent sickness	15.2
Consequences of child anemia	
Impaired learning	9.3
Impaired development	38.6
Poor concentration	18.5
Fatigue	38.2
Dizziness	38.7
Shortness of breath	17.6
Rapid heartbeat	12.5

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 955 to 961.

Key Findings

Good nutrition and health knowledge are important drivers of proper health and nutrition practices, which, in turn, determine nutrition and health outcomes. Women's knowledge was generally mixed, with clear room for improvement in some key domains.

- With respect to hygiene, all women mentioned the importance of soap for washing hands, but only a small percentage mentioned the importance of washing hands before feeding a child or after changing a child's diaper.
- Knowledge regarding foods and the nutrients they provide was generally good. However, only one-third of all women knew that reducing sugar and soft-drink intake is important to control body weight, and very few were aware that lack of physical activity is a key driver of unhealthy weight gain.
- Some danger signs for pregnancy and dangers child illness were known to most mothers, but some important danger signs were rarely mentioned. Danger signs require immediate medical attention. Not recognizing a danger sign could thus have severe negative health consequences.
- Even though all women knew that colostrum should be fed, and many were aware of the key health benefits for the child, fewer than 60 percent of women thought that

children should be breastfed immediately after birth. Early initiation of breastfeeding (within the first hour after delivery) ensures that the child receives the colostrum (which provides protective factors). Another interesting finding is that many women knew about the importance of exclusive breastfeeding, but only about one-third of women actually exclusively breastfed their child (see next chapter).

- Knowledge about the correct age to introduce foods (besides breast milk) into the child's diet was very limited.

- Nearly all women knew about ORS, but knowledge about the prevention and treatment of diarrhea was limited. Limited knowledge about the consequences of undernutrition in children was found to be common too.

The results show that the population could greatly benefit from home visits and training by the Raedat Refiat program and from the nutrition messages FAS plans to include in its program. The focus should be on areas where knowledge is lacking, but the approach will need to take into account the high illiteracy level in this population: 57.5 percent of the women in the study sample could not read. Using platforms like text messages and text-based posters and billboards would reach less than half of the population.

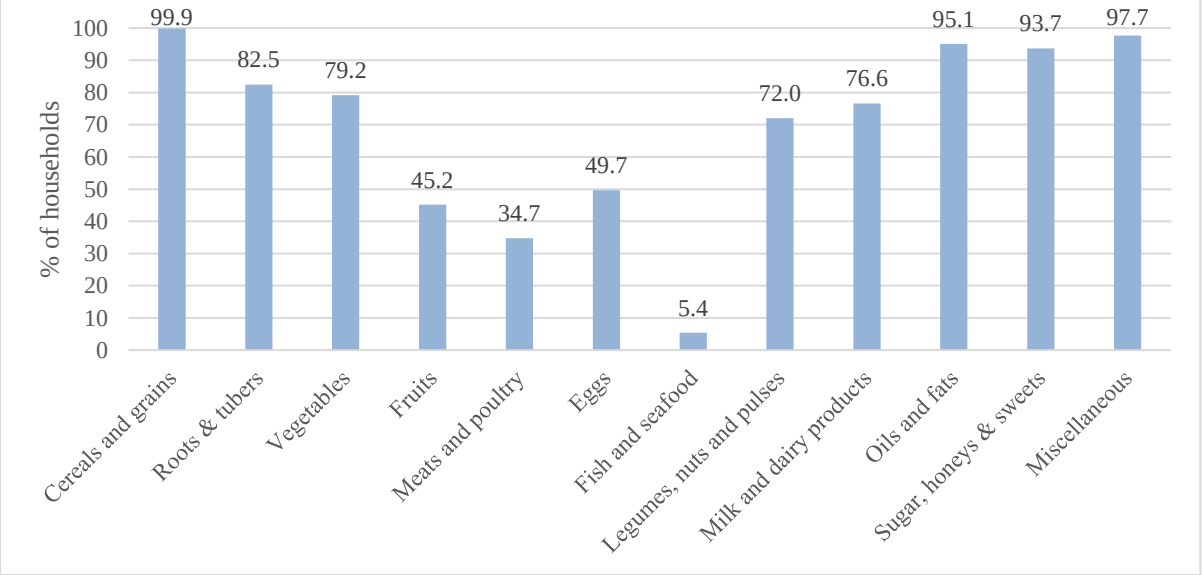
F. Dietary Diversity and Feeding Practices

This chapter presents results on household and women's dietary diversity and on infant and young child feeding (IYCF) practices (that is, in children under the age of two years). Household dietary diversity, women's dietary diversity, and IYCF are secondary outcomes of the FAS evaluation project.

Household Dietary Diversity

On average, households reported consuming eight (8.3 out of 12) food groups in the 24 hours preceding the survey. Around half (56.1 percent) of the surveyed households consumed fewer than eight food groups. Nearly all households reported consuming cereals and grains; oils, and fats; and sugar, honey, and sweets (Figure 3.2). Animal-source food consumption varied by type: approximately three-fourths of all households consumed dairy; meat consumption was reported by only one-third of all households; fish consumption was rare (5.4 percent of households).

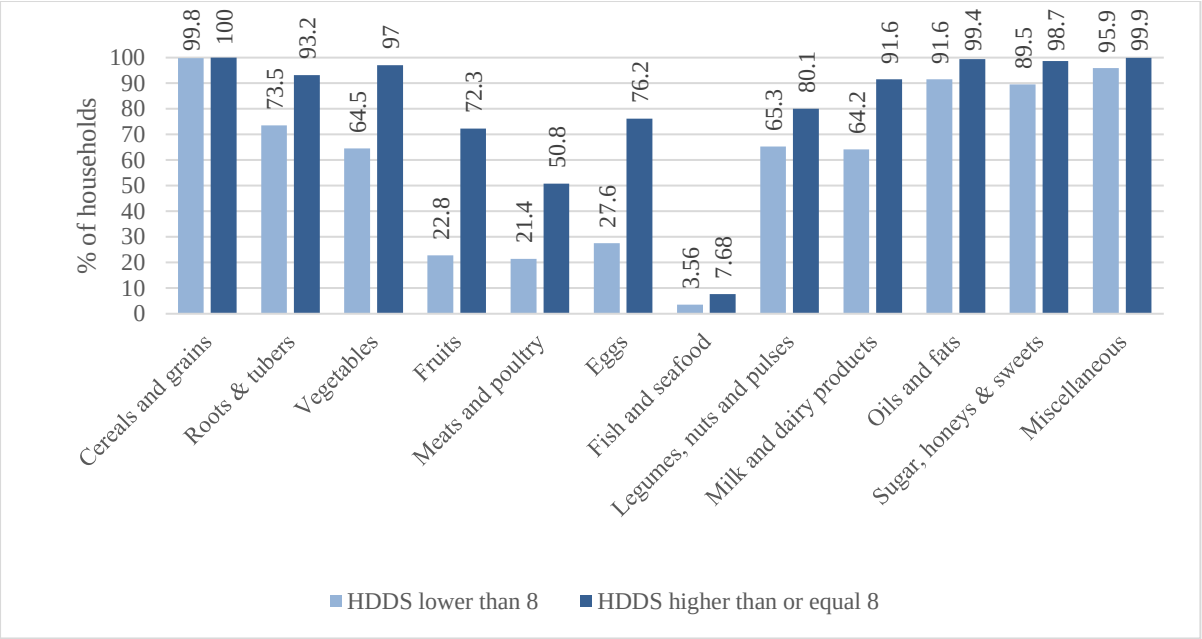
Figure 3.2. Consumption of food groups for all households



Source: Own estimation, based on farm household baseline survey.

Comparing households that consumed fewer than eight food groups with those that consumed eight or more shows that the differences are largest for micronutrient-rich foods, such as fruits and vegetables and all animal-source foods, with low-diversity households much less likely to consume those food groups (Figure 3.3).

Figure 3.3. Consumption of food groups by HDDS



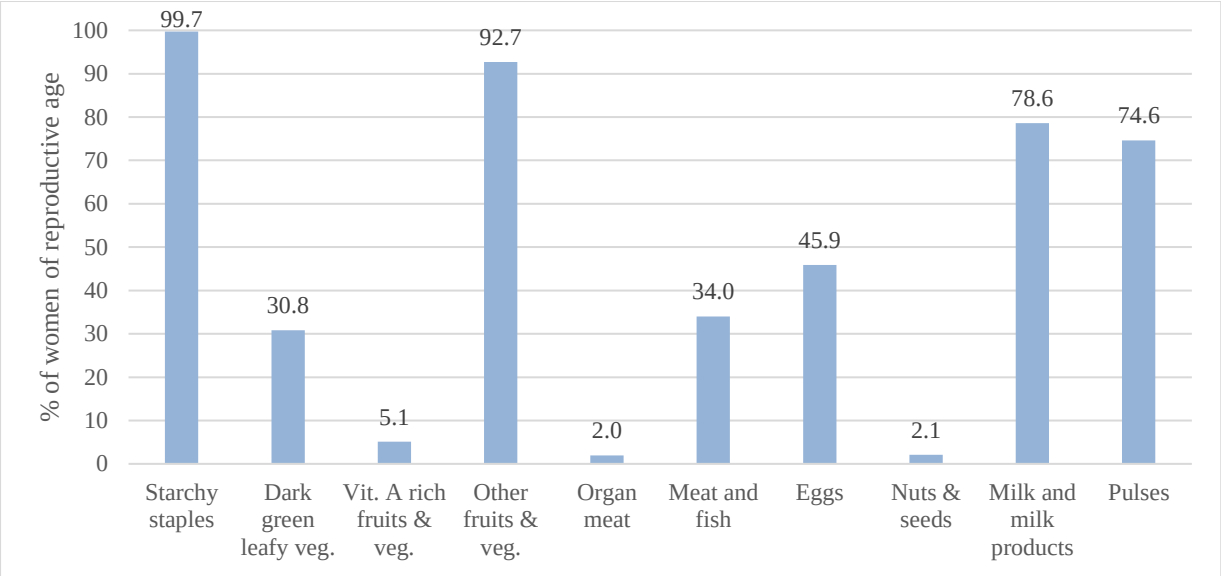
Source: Own estimation, based on farm household baseline survey.
Note: HDDS stands for Household Dietary Diversity Score

Women's Dietary Diversity

On average, women consumed less than five food groups (4.7 out of 10)—that is fewer than the five food group cutoff defined in the MDD-W indicator (FAO and FHI 360 2016). Around half of the women (53.2 percent) consumed at least five food groups. This finding suggests that a large proportion of women in the study population are likely to have inadequate micronutrient intakes. The most commonly consumed food group among women were starchy staples, which was consumed by approximately all women, during the 24 hours preceding the survey. About 8 out of 10 women had consumed milk and dairy products. Consumption of meat and fish was uncommon (34.0 percent). Only 5.1 percent of women reported consuming vitamin A–rich fruits and vegetables (Figure 3.4).

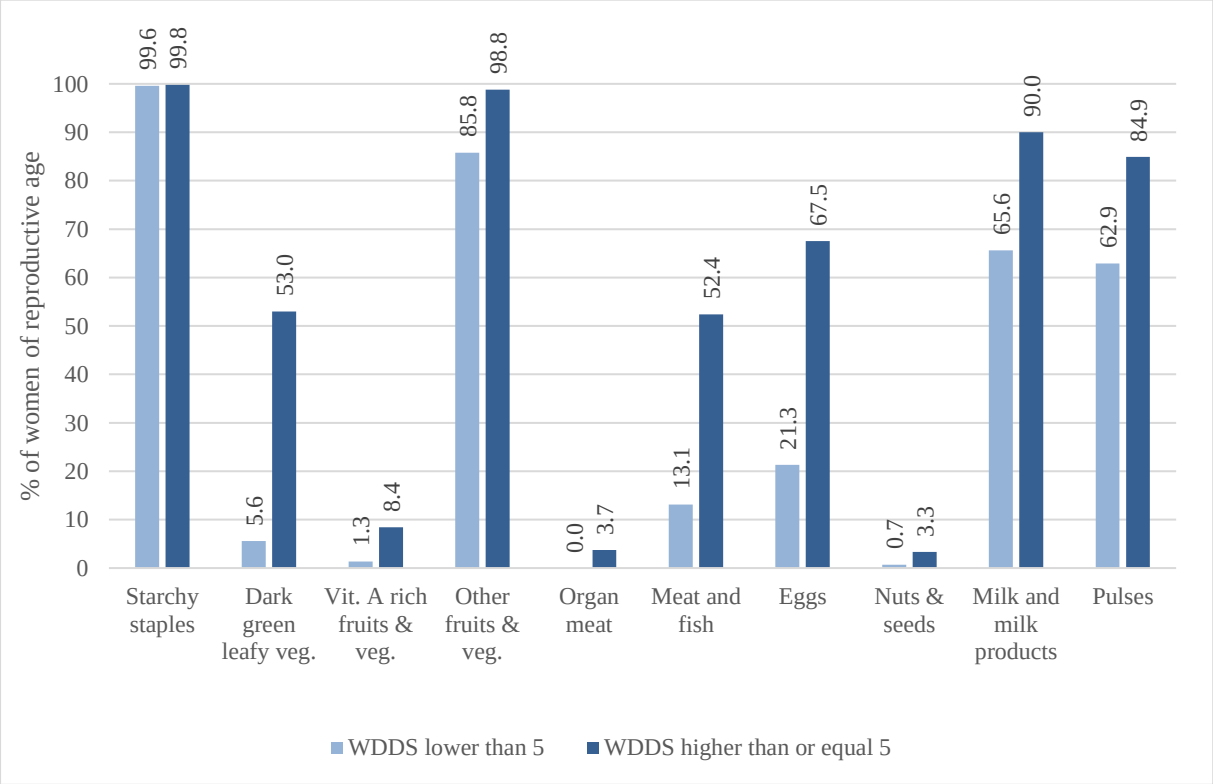
Women consuming fewer than five groups, were much less likely to consume animal-source foods, dark-green leafy vegetables, and vitamin A–rich fruits and vegetables (Figure 3.5).

Figure 3.4. Women's consumption of food groups



Source: Own estimation, based on farm household baseline survey.

Figure 3.5. Women's consumption of food groups by WDDS



Source: Own estimation, based on farm household baseline survey.
Note: WDDS stands for Women Dietary Diversity Score

Infant and Young Child Feeding Practices

Nearly all of the children 0–23 months of age (94.7 percent) had ever been breastfed, but only one-third of infants under six months of age (36.4 percent) were exclusively breastfed during the 24 hours preceding the survey (Table 3.31); the percentage of the infants who were predominantly breastfed was 72.7 percent.[21] In addition, almost all children were still breastfed at one year of age, but this percentage dropped considerably by two years of age when only 33.8 percent were still being breastfed. The low rates of exclusive breastfeeding and continued breastfeeding explain why only half (50.7 percent) of all children received age-appropriate breastfeeding. The use of bottles was low, with 11.7 percent reporting having used a bottle to feed their child in the past 24 hours.

Of children aged 6–8 months, only 61.3 percent had started eating complementary foods (the recommended age for introduction of complementary foods is six months). Additionally, only around one-fifth of children aged 6–23 months had consumed iron-rich food in the past 24 hours. Only around half of all children 6–23 months of age (52.4 percent) had consumed foods from at least four different food groups in the past 24 hours; only about 4 out of 10 children (42.9 percent) received the minimum number of meals recommended for their age,[22] and only one-fifth (21.9 percent) of all children were classified as receiving a minimal acceptable diet.[23]

Less than half of the children reportedly consumed flesh food (21.7 percent), eggs (35.0 percent), vitamin A–rich fruits and vegetables (17.7 percent), or legumes and nuts (42.9 percent) (Figure 3.6). When comparing the dietary diversity of children meeting the minimum of four groups with those who did not, large differences were found across all food groups. Consumption of flesh food and vitamin A–rich fruits and vegetables was particularly low (below 10 percent) in the group with an overall diversity below four (Figure 3.7).

[21] *Predominant breastfeeding* means that the infant's predominant source of nourishment has been breast milk. The infant, however, may have also received liquids (water and water-based drinks, fruit juice) ritual fluids, and ORS, drops, or syrups (vitamins, minerals, and medicines).

[22] At least two for breastfed children 6–8 months of age, at least three for breastfed children 9–23 months of age, and at least four for non-breastfed children

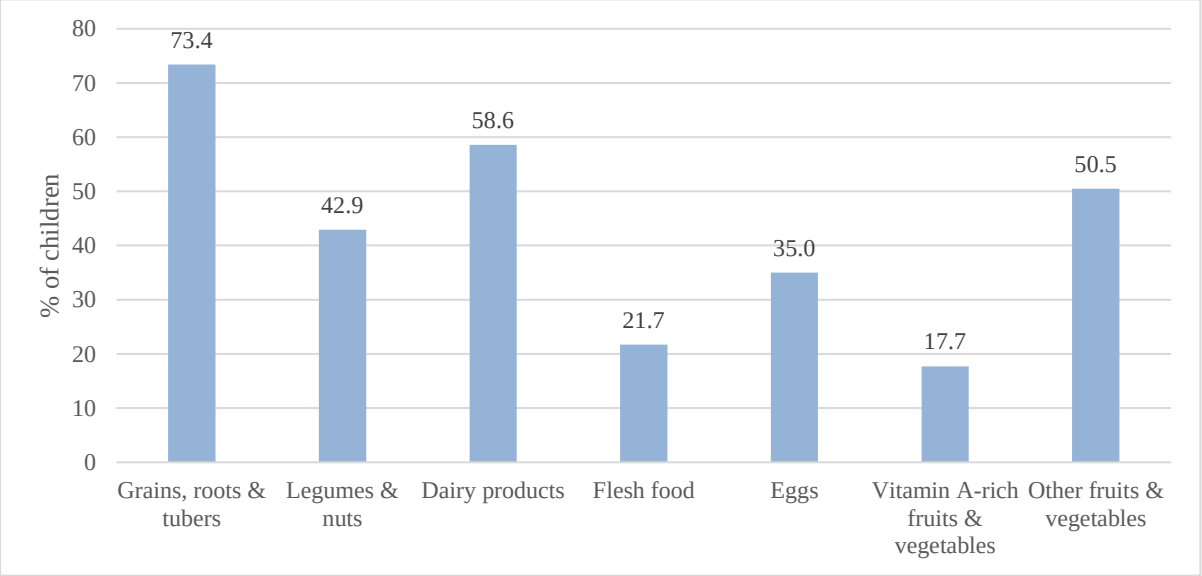
[23] As explained in the methods section, this indicator was calculated for both breastfed and non-breastfed children: for breastfed children it was defined as meeting both the minimum dietary diversity and the minimum meal frequency requirements, and for non-breastfed children, it was defined as having received at least two milk feedings, having consumed at least four food groups (out of six nutrient-rich food groups) and the minimum meal frequency in the past 24 hours.

Table 3.31. IYCF practices

	Percent
Ever breastfed (0–23 months)	94.7
Exclusive breastfeeding (0–5 months)	36.4
Predominant breastfeeding (0–5 months)	72.7
Continued breastfeeding 1 year (12–15 months)	89.5
Continued breastfeeding at 2 (20–23 months)	33.8
Age appropriate breastfeeding (0–23 months)	50.7
Bottle feeding (0–23 months)	11.7
Appropriate milk feeding frequency for non-breastfed (6–23 months)	5.9
Introduction of (semi)solid/soft food (6–8 months)	61.3
Consumption of iron-rich foods (6–23 months)	22.9
Minimum dietary diversity (> = 4) (6–23 months)	52.4
Minimum meal frequency (6–23 months)	42.9
Minimum acceptable diet (6–23 months)	21.9

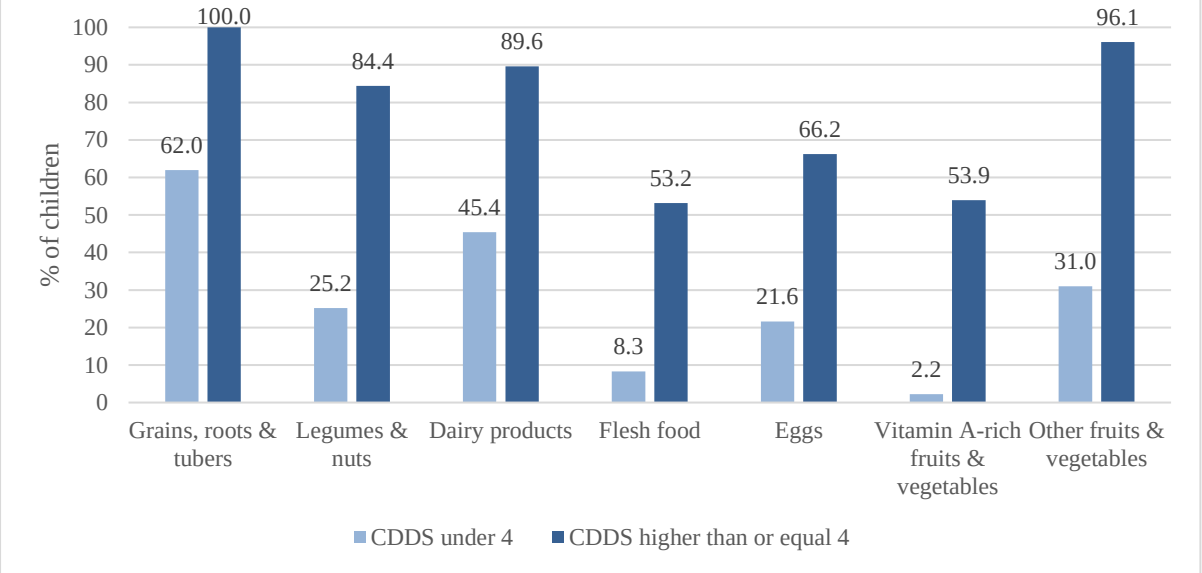
Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 55 to 453.

Figure 3.6. Children's consumption of food groups



Source: Own estimation, based on farm household baseline survey.

Figure 3.7. Children's consumption of food groups in children below or above the 4-group cut-off



Source: Own estimation, based on farm household baseline survey.
Note: CDDS stands for Child Dietary Diversity Score

Key Findings

The findings presented in this section indicate a large scope for improvements in dietary diversity and feeding practices:

- Household diets were found to be low in key micronutrient-rich foods, such as animal-source foods and fruits. Limited intake of these foods can lead to micronutrient deficiencies.
- A similar picture was found when assessing women's dietary diversity. Another alarming finding is that the feeding practices of children 6–23 months of age were grossly inadequate. The diversity of the children's diet was very limited, few children were fed iron-rich foods, and the feeding frequency was largely suboptimal.
- Nearly all of the children 0–23 months of age (94.7 percent) had ever been breastfed, but only about half of all children were being breastfed age-appropriately.

These findings might be due to lack of resources to purchase more nutrient-dense foods, lack of knowledge, or a combination of both. The FAS and IMCHN interventions, which aim to increase both household income and nutrition knowledge, thus provide a good opportunity to address both underlying factors.

G. Maternal and Child Nutrition

Maternal and child nutritional status, which are secondary outcomes of FAS evaluation project, are presented in this chapter. Nutritional status was assessed using the following anthropometric indicators: height-for-age z-score (HAZ), weight-for-height z-score (WHZ), BMI-for-age z-score (BMIZ) and the prevalence of stunting, wasting, and overweight for children, as well as body-mass-index (BMI) and the prevalence of overweight and obesity for women.

Women's Anthropometry

Among women 19–45 years old, 35.0 percent were found to be overweight, and 27.6 percent were obese, while being underweight was uncommon (2.1 percent) (Table 3.32). Very few women (0.9 percent) had a height below 145 cm, the cutoff often used to identify women at high risk of obstructed labor.

Table 3.32. Anthropometry of women

	Percent / Mean ± SD
Weight (kg) (Mean ± SD)	68.3 ± 14.4
Height (cm) (Mean ± SD)	158.0 ± 5.3
Height under 145 cm	0.9
BMI (Mean ± SD)	27.3 ± 5.6
Underweight (BMI < 18.5)	2.1
Normal weight (BMI 18.5 – 24.9)	35.0
Overweight (BMI 25.0 – 29.9)	35.2
Obese (BMI ≥ 30.0)	27.6

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 2,471 to 2,600.

Children's Anthropometry

The overall prevalence of stunting (HAZ < -2 SD) among all children under five years of age was 17.9 percent (Table 3.33). As is often observed, the prevalence in boys (19.1 percent) was higher than in girls (16.7 percent), and the prevalence in younger children (15.6 percent) was lower than in older children (19.1 percent), but these differences were statistically insignificant. Similar sex- and age-related patterns were found for HAZ (Table 3.34).

We did not observe any wasting in this population; the mean weight-for-height z-scores and BMIZ were above zero in the overall sample and in each of the subgroups. We did, however, find a problem of excess weight in children: 27.3 percent of the children in the sample had a

BMIZ above 1, which WHO has categorized as being at risk of overweight.[24] In addition, 7.3 percent of all children were overweight, and 2.8 percent were obese. No significant differences were found between boys and girls, or between children across the different age groups.

Table 3.33. Anthropometric measurements of children 0–59 months

	Percent / Mean ± SD
HAZ (Mean ± SD)	-0.8 ± 1.4
WHZ (Mean ± SD)	0.3 ± 1.2
BMIZ (Mean ± SD)	0.3 ± 1.2
Stunted	17.9
Wasted	1.7
Risk of overweight (BMIZ > 1)	27.3
Overweight (BMIZ > 2)	7.3
Obese (BMIZ > 3)	2.8

Source: Own estimation, based on farm household baseline survey.
Note: Sample size ranged from N = 1,203 to 1,219.

[24] In a healthy population, we expect 15.9 percent of children to have a BMIZ above 1.

Table 3.34. Anthropometric measurements of children, by age and sex

N	0–23.9 months	24–59.9 months	Mean difference test		Girls	Boys	Mean difference test	
			SE	Sign.			SE	Sign.
HAZ (Mean ± SD)	-0.6 ± 1.6	-1.0 ± 1.3	0.11	***	-0.7 ± 1.4	-0.9 ± 1.3	0.08	**
WHZ (Mean ± SD)	0.1 ± 1.2	0.3 ± 1.2	0.10	**	0.3 ± 1.1	0.2 ± 1.2	0.07	*
BMIZ (Mean ± SD)	0.2 ± 1.3	0.4 ± 1.2	0.10	**	0.4 ± 1.2	0.3 ± 1.3	0.07	
Stunted (%)	15.6	19.1	2.44		16.7	19.1	2.44	
Wasted (%)	2.5	1.4	0.99		0.8	2.8	0.84	**
Risk of overweight (BMIZ>1) (%)	25.1	28.3	3.58		27.3	27.2	2.28	
Overweight (BMIZ>2) (%)	7.7	7.1	2.30		7.1	7.6	1.06	
Obese (BMIZ>3) (%)	2.0	3.2	1.51		2.6	3.1	0.86	

Source: Own estimation, based on farm household baseline survey.

Note: Sample size ranged from N = 402 to 409 for children 0–23.9 months; N = 800 to 810 for children 24–59.9 months; N = 622 to 629 for girls; and N = 580 to 590 for boys. The significance of mean difference is assessed by an estimation regressing the outcome variable on the group variable identifying beneficiary and comparison households. Standard errors (SE) are clustered at the village level.

***, **, * Per the p-value of the coefficient estimate, mean difference is statistically significant at the 1, 5, and 10 percent level, respectively.

Key Findings

The maternal and child health and nutrition-related findings can be summarized as follows:

- We found that nearly two-thirds of the women in our sample were overweight and obese. This finding is of great concern. Higher BMI has been found to be significantly associated with higher all-cause mortality; the association is considerably stronger in obese adults than it is for normal weight or overweight individuals. Berrington De Gonzalez (2010) estimated that every five-unit increase in BMI was associated with a 31 percent increase in mortality risk. In addition, the high rates of overweight and obesity and the associated noncommunicable diseases (such as diabetes and hypertension) are putting extreme pressures on the health system.

- Around 18 percent of all children were found to be stunted in the study population. This shows that children in this population are not being fed adequate diets (as is shown in our results on infant and young child feeding practices) and may be suffering from repeated illness. We note that the stunting estimate is lower than that from the 2014 DHS, which reported 24.8 percent of children under five years old in rural Upper Egypt to be stunted. The quality of the 2014 DHS anthropometric results, however, has been questioned, and questionable quality could have affected the stunting estimate (Assaf et al. 2015).

- A finding of great concern is the excessive weight of children in the study population: a large proportion were found to be at the risk of being overweight, while 7.3 percent were actually overweight, and nearly 3 percent were obese. Childhood overweight has short- and long-term negative consequences for health. Short-term consequences include raised cholesterol levels, type 2 diabetes, and high blood pressure. In the longer term, children with excessive weight are much more likely to suffer from obesity and obesity-related illness in adulthood. A key challenge for interventions addressing the problem of stunted linear growth (and undernutrition) is thus to not aggravate the problem of overweight and obesity.

IV. SUMMARY AND IMPLICATIONS FOR AGRICULTURAL AND HEALTH PROGRAMS

This baseline study report presented the findings from the household listing survey of the first phase of the FAS-IMCHN evaluation project, conducted in March – April 2018, and the farm baseline household survey, conducted in April – May 2018. For the farm household baseline survey, a total of 2,246 households (1,129 FAS-listed households and 1,117 comparison households) were interviewed.

Findings from the household listing survey showed that only 60.3% of the listed FAS farmers could be verified. Of all verified farmers, only 69.2% of listed FAS farmers committed to a FAS-facilitated forward contract and only 14.9% attended a FAS training for producing and marketing vegetables or herbs/spices. Given this low verification and treatment rates, project effects, at this point, can neither be expected nor detected statistically. The listing survey also revealed that only 1.5% of all 2,246 households received a visit from a Raedat Refiat over the past year prior to the survey, a number much lower than official estimates suggest. Due to this unexpected, extremely low coverage of the Raedat Refiat program (through which IMCHN is implemented), it was not possible to estimate project effects for IMCHN during this first round.

As such, the survey data presented in this report serves as a baseline against which IMCHN and future FAS interventions can be assessed. In addition to serving as a baseline survey, the findings from the farm household survey presented in this report can also make an important contribution to evidence-based agricultural and health project and policy design. There is a lack of comprehensive and recent agricultural and health data for (Upper) Egypt and this farm household survey makes an important contribution to filling this gap.

The remainder of this chapter summarizes the key results from the farm household survey and provides recommendations for the design of future agri-business or health related projects in Egypt, including ongoing projects like FAS and IMCHN.

A. Farm Characteristics and Targeting

The main target population for projects that aim at improved marketing for high value crops are households that have prior experience in these areas. Results show that most farms in the survey are diversified, complementing cereal production with cultivation of vegetables, herbs/spices, and fodder crops and raising medium and large livestock, in addition to keeping poultry. The levels of agricultural asset and livestock ownership among the interviewed farmers are larger than those among the average farm household population in Upper Egypt, implying that the sampled farm households are likely to be better-off. This is expected as projects that promote high-value crops tend to attract farm households that have more resources and can thus better cope with potential production and marketing risks that may come along with changes in production patterns associated with project participation (Oakley 1991).

One would also expect that agri-business projects like FAS target farm households, in which the majority of employment (or income) is derived from farming, as compared to households that derive their incomes from non-farm incomes. Results from the survey showed that about 80% of household heads reported agriculture as their primary occupation, indicating good targeting.

B. Areas for Improving Agricultural Production

Yields of most crops reported in the farm household survey are lower, but within a reasonable range, of average yields reported for Upper Egypt. While those average yields reported by MALR may be biased by larger, higher-intensity farms, there may still be scope for further increasing yields for some crops. Results from the survey show that the farming systems are already very intensive, with very little fallow land, nearly universal use of synthetic fertilizer, and widespread usage of pesticides on all common crops. Preliminary results even suggest that fertilizer and pesticides are sometimes overused. The vast majority of farmers use traditional flood irrigation. Less than 2 percent of farmers have drip irrigation systems, which are more water efficient and well-suited for most horticultural systems.

Further improvements in productivity and profitability can thus be expected from more efficient use of fertilizers and pesticides and more efficient irrigation systems. However, it is important to note that addressing issues such as fertilizer (over) use and improving irrigation efficiency is likely to require changes at the policy level, not only the farm level. Fertilizer and irrigation water are subsidized (indirectly through diesel subsidies and zero cost of water), and most farmers do not have constant access to irrigation water. This encourages flood irrigation but discourages drip and sprinkler irrigation. In fact, more than half of the farmers report that they water their fields every fifth day or less frequently during the crops' main growing period.

C. Areas for Improved Marketing

Nearly all farms in the survey are already highly commercialized, and only relatively small shares of the harvest is kept for own consumption. Farmers sell most of their harvest to a single buyer such as a trader or processor. Less than 5 percent of all marketed batches were sold directly to the end-consumers in local markets. And, most harvest batches were sold all at once—and not sold in different charges to several buyers. These marketing patterns also suggest that the interviewed farmers are well integrated in specialized value chains for (most of) the cultivated crops. Most farmers reported that they did not have any issues with the buyers of their harvested batches (88.5 percent in the summer season 2017 and 85.1 percent in the winter season 2017-18).

Yet, in the case of 11.1 percent of all marketed batches of the summer season harvest and 13.9 percent of all marketed batches of the winter season (at the time of the farm household baseline survey), the farmer reported that he received the payment delayed or not in time. These results also imply that farmer associations and agricultural cooperatives do not seem to act as

intermediaries between the member farmers and buyers. No interviewed farmer reported to have sold harvest batches to their associations (or cooperatives). Bundling harvests at the association level, grading the produce, and selling larger quantities to buyers provide opportunities for collectively achieving higher price margins. Moreover, it can provide more marketing opportunities, as most buyers are interested in purchasing larger quantities of uniform products, and permanent seller-buyer relationships could be established. Such an approach, however, requires investments in training of staff and perhaps even in marketing and storage facilities at the association level.

In addition to farm- and association-level interventions, there is scope for improving infrastructure such as transportation networks that would better connect Upper Egypt to Lower Egyptian and international markets, such as railway upgrades and the establishment of river transport system (World Bank 2009; Tellioglu and Konandreas 2017). The current limitations in terms transportation and cold storage supply chains leads to a high food loss rate, especially for fruits and vegetables (EIU 2017).

D. Areas for Improving Agriculture-Nutrition Linkages

Agricultural interventions can impact nutrition through six pathways: (1) food access from own production; (2) income from the sale of agricultural commodities produced; (3) food prices from changes in supply and demand; (4) women's empowerment and social status through increased control over resources; (5) women's time through participation in agriculture (which can be positive or negative for their own nutrition and that of their children); and (6) women's health and nutrition through engagement in agriculture (again, either positive or negative, depending on exposure to toxic or infectious agents and the balance between energy intake and expenditure (Ruel, 2013).

With the first round of data collected in this study only the first two pathways can be explored to some extent. A key limitation is that the data are obviously cross-sectional (data can only be compared across households and not over time) and observational, which means that no causal claims can be made at this point. The pathways mentioned above can be more extensively explored with panel data that will be available from the planned follow-up survey in 2019.

With respect to the first pathway, i.e. consumption of agriculture products produced on the farm, we found that farmers cultivated crops largely for commercial purposes and kept only small shares of the harvest for own consumption. Findings also show that the most common crops were harvested in one batch, with the exception of basil and tomatoes. These findings suggest that the direct "own consumption channel" may be of limited importance in this study population.

With respect to the income pathway, the better-off households in the study sample were found to have higher household dietary diversity scores (HDD) than households at lower quintiles of income. This reflects these households having access to more nutrient-dense diets. The results also show that households at higher quintiles of expenditures (as a proxy for income) spent

more on food from groups with higher nutritional content like animal source foods, fruits and vegetables. While these findings support the "income-food consumption" channel, there are also indications that increasing income may lead to overconsumption of high-calorie foods that affect nutrition. For example, the analysis reveals that per capita expenditure of cereals, sugary foods and fats is substantially higher among higher expenditure quintiles compared to households in poorer quintiles.

In summary, we do see that total expenditure is related to more nutrient dense diets, but more research is needed to determine to what extent income from agriculture plays a role in this. Evidence from other countries shows that nutrition-sensitive agricultural programs can improve a variety of nutrition outcomes in both mothers and children, but they are more effective at doing so when they include nutrition and health behavior chance communication and interventions focused at increasing women's empowerment. Greater impacts on child nutritional status are typically achieved when programs incorporate health and water, sanitation and hygiene interventions and micronutrient-fortified products (Ruel et al., 2018).

E. Areas for Improving Health and Nutrition Knowledge and Practices

Maternal and child health and nutrition outcomes depend on health and nutrition practices (such infant and young child feeding and hygiene), which in turn are based on having proper health and nutrition knowledge. Our survey found that women's knowledge in all domains assessed was generally mixed, with clear room for improvement. For instance, all women mentioned the importance of soap for washing hands, but only a small percentage mentioned the importance of washing hand before feeding a child or after changing a child's diaper. Another example is that all women knew that colostrum should be fed to the newborn and knew why that was important, but fewer than sixty percent of women thought that children should be breastfed immediately after birth. Knowledge about the correct age to introduce foods (besides milk) into the child's diet was very limited.

The nutrition practices the survey assessed revealed several areas for improvement. Even though many women knew about the importance of exclusive breastfeeding, only about one-third exclusively breastfeed their child and only about half of all children were being breastfed age-appropriately. We found that the feeding practices of children 6 to 23 months of age were often inadequate: few children were fed iron-rich foods, feeding frequency was too low, and the dietary diversity of children's meals was suboptimal. The assessment of the dietary diversity of mothers and that of the household revealed a similar picture: the consumption of micronutrient-rich foods, such as animal source foods and fruits was limited.

Our findings suggest that improving health and nutrition practices through improved knowledge in these domains holds the potential to improve the wellbeing of the study population. Community health workers provide a potentially effective platform for communicating health and nutrition knowledge to households. The goal of IMCHN was to tap into that potential, i.e. to develop a national training system for the Raedat Refiat program and implement it at scale in 18 governorates of Upper Egypt and Lower Egypt.

However, this study found an extremely low coverage of the Raedat Refiat program among rural farm households in Upper Egypt: only 1.5% of all surveyed households received a visit from a Raeda Refia in the year preceding the survey. The coverage is too low to have a meaningful impact on nutrition and health outcomes. Thus, in addition to training the Raedat Refiat, the program will need to restructure its operations to ensure much higher coverage.

In addition to the Raeda Refiat, other platforms could be used to improve maternal health and nutrition knowledge. The choice of platform, however, will need to take into account the very low literacy levels of the study population: over half of the mothers of children 0 to 5 years of age could not read and only one-third were able to read fluently. While nearly all households have cellphones, the use of text message for nutrition and health education would have little impact.

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APPENDIX I: STATEMENT OF WORK

STATEMENT OF WORK

Impact Evaluation

Of the

Feed the Future Egypt, Food-Security and Agribusiness Support Project (FAS)

And the

Improving Maternal, Child Health and Nutrition Services Project (IMCHN)

Activity Name: Evaluating Impact and Building Capacity (EIBC)

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Resubmitted on: February 23, 2017

I. PURPOSE OF THE EVALUATION

The United States Agency for International Development in Egypt (USAID/Egypt) awarded the International Food Policy Research Institute (IFPRI) a grant for the implementation of the Evaluating Impact and Building Capacity project (EIBC). The EIBC project covers three components: (1) evaluations of USAID-funded agriculture and nutrition-related projects in Upper Egypt; (2) capacity building of the Ministry of Agriculture and Land Reclamation (MOALR) related to monitoring and evaluation (M&E) of development programs; and (3) promotion of evidence-based policy making through demand-driven, actionable research, and policy advisory services. Under Component 1, IFPRI proposes to conduct an impact evaluation study for the Food Security and Agribusiness Support project (FAS) and the Improving Maternal, Child Health and Nutrition Services project (IMCHN) in Upper Egypt.[25] IFPRI aims for the most rigorous, feasible, and ethically acceptable impact evaluation design. The proposed evaluation methods will allow for the attribution of each project's impacts (FAS and IMCHN) to the specific project interventions and hence to infer causal relationships between the projects and the outcomes.

The specific purposes of the FAS-IMCHN impact evaluation study are (1) to assess the impact of FAS interventions on project outcome indicators, (2) to assess the effects of IMCHN interventions on maternal and child health and nutrition knowledge in rural Upper Egypt, and (3) to generate a better understanding of the impact pathways in both projects and to explore potential agriculture-nutrition linkages facilitated by the overlap of the projects. The key indicators for measuring the impact of FAS are defined by the project goals and relate to household income (measured by total household expenditure), household food security,[26] and maternal and child nutrition among smallholder farm households.

In addition to these specific purposes, the FAS-IMCHN impact evaluation study aims at providing evidence for improved decision making. The findings from the analysis are expected to support USAID in evaluating the success of FAS and IMCHN and to help USAID and other development agencies in designing and implementing agriculture-related and health- and

[25] Initially, USAID/Egypt requested IFPRI to also evaluate the USAID-funded Advanced Marketing Agribusiness Logistics project (AMAL). IFPRI submitted the Statement of Work (SOW) for the AMAL evaluation study to USAID/Egypt on September 15, 2016, and resubmitted it on October 3, 2016—after comments have been addressed. At the time of submission of this SOW, the resubmitted SOW for the AMAL evaluation was under review by USAID. On November 7, 2016, USAID/Egypt requested IFPRI to discontinue the AMAL evaluation study acknowledging that because IFPRI's EIBC project started later than the AMAL project, it was impossible for IFPRI to collect proper baseline data that would have been required to conduct a quantitative impact assessment. Changes to this revised SOW have been made to consider the discontinuation of the AMAL evaluation study.

[26] "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability. The nutritional dimension is integral to the concept of food security" (FAO 2009, fn. 1). "Household food security" narrows the scope of observation to the household and individual levels, incorporating the pillars of food access and utilization (in addition to stability, which captures issues of variations in food access and utilization over time) (Ecker and Breisinger 2012).

nutrition-related programs and projects in Upper Egypt and similar contexts in the future. It is also expected that the study conclusions will be useful for national and local policy makers in the agriculture and public health sectors in policy formulation and reforms toward greater policy effectiveness. Moreover, IFPRI expects that the study findings and conclusions will make an important contribution to knowledge on agriculture-nutrition linkages and the respective academic literature.

II. SUMMARY INFORMATION

This Statement of Work (SOW) document presents the study design and implementation plan of IFPRI's impact evaluation study of the Food Security and Agribusiness Support project (FAS) and Improving Maternal, Child Health and Nutrition Services project (IMCHN) in Upper Egypt. Tables 1 and 2 provide project summary information.

Table 1: FAS summary information

Project name	Food Security and Agribusiness Support
Implementer (primary)	Cultivating New Frontiers in Agriculture
Cooperative agreement no.	263-A-15-00022
Total estimated ceiling of the evaluated project (TEC)	USD 23 million
Life of project	July 2015 – June 2020
Active geographic regions	Rural areas in seven Upper Egypt governorates (Aswan, Assiut, Beni Suef, Luxor, Menia, Qena, Sohag)
Development objectives (DOs)	Project goal: To increase the incomes of 14,000 Upper Egypt smallholder farmers, enhance food security of farm households, and improve the nutritional status of women and young children. Project components: (1) Improved on-farm production; (2) more efficient post-harvest processes; (3) improved marketing of agriculture crops and products; (4) improved nutritional status, especially for women and children.
USAID office	USAID/Egypt

Source: USAID and VEGA (2015), VEGA (2016).

Table 2: IMCHN summary information

Project name	Improving Maternal, Child Health and Nutrition Services
Implementer	Maternal and Child Survival Program partners, led by Save the Children
Cooperative agreement no.	AID-OAA-A-14-00028
Total estimated ceiling of the evaluated project (TEC)	USD 3.5 million
Life of project	April 2016 – March 2018
Active geographic regions	Phase II implementation at scale: All nine Upper Egypt governorates
Development objectives (DOs)	Goal: To end preventable child and maternal deaths within a generation. Objectives: 1. To develop a national strategy for Egypt's Community Health Workers (CHWs) that reflects the Family Health Package of the Ministry of Health and Population (MOHP) and will support MOHP in reaching the targets of the Sustainable Development Goals (SDGs). 2. To develop a national training system for the Raedat Refiat program (i.e. CHW program in rural areas) and implement at scale in all nine governorates of Upper Egypt.
USAID office	USAID/Egypt

Source: Jhpiego et al. (2016).

III. BACKGROUND

A. Description of the Problem, Development Hypothesis, and Theory of Change

Context, History, and Problem Statement

The United States Agency for International Development in Egypt (USAID/Egypt) awarded the International Food Policy Research Institute (IFPRI) a grant for the implementation of the Evaluating Impact and Building Capacity project (EIBC) over a five-year period (2015-2020) in June 2015. The overall project goal is to contribute to rural income growth, poverty reduction, food security, and adequate nutrition in Egypt. To achieve this goal, EIBC has three components:

1) *Impact evaluation* of USAID-funded agribusiness-promoting and nutrition and health-related projects in Upper Egypt;
2) *Capacity building* of the Ministry of Agriculture and Land Reclamation related to monitoring and evaluation of development programs; and
3) *Promotion of evidence-based policy making* through demand-driven, actionable research and policy advisory services.

Under Component 1, IFPRI proposes to conduct an impact evaluation study for the Food Security and Agribusiness Support project (FAS) and the Improving Maternal, Child Health and Nutrition Services project (IMCHN) in Upper Egypt. FAS is part of USAID/Egypt's Agribusiness for Rural Development and Increasing Incomes program (ARDII) and is aligned with the Feed the Future initiative (FtF) of the US Government. IMCHN is part of USAID's global Maternal and Child Survival Program (MCSP).

Goal and Objectives

The overarching objective of the FAS-IMCHN impact evaluation study is to learn whether promotion of agribusiness activities, along with nutrition and health promotion activities, improve rural household livelihoods and particularly household food security and individual nutrition, especially of young children and their mothers. Achieving this, first EIBC strategic result (SR) will contribute to achieving the first EIBC intermediate result (IR) and ultimately the EIBC Goal (Subsection B).

The specific study objectives are (1) to estimate the impact of FAS interventions on project outcome indicators—especially on household income (measured by total household expenditure), household food security, and maternal and child nutrition—among farm households; (2) to estimate the effects of IMCHN interventions on maternal and child health and nutrition knowledge among community health workers (CHWs) and among farm households; and (3) to analytically explore potential synergistic effects of FAS and IMCHN interventions on maternal and child nutrition among farm households being exposed to both projects. The study area comprises rural communities in Upper Egypt.

The first two specific objectives emerge directly from the project goals and objectives of FAS and IMCHN, respectively (Subsection C). The proposed impact evaluation approach will allow for the evaluation of the impact of FAS and the impact of IMCHN separately of each other. Two complementary evaluation designs are proposed: an *experimental* design for the evaluation of FAS, and a *plausibility* design for the evaluation of IMCHN. The planned FAS impact evaluation method will provide estimates of household income, household food security, and child and maternal nutrition indicators among farm households and estimates of changes in these indicators over time that are attributable to the FAS interventions. The planned IMCHN impact evaluation method will provide estimates of indicators of maternal and child health and nutrition knowledge among CHWs and farm households and estimates of changes in these indicators over time that result plausibly from the IMCHN interventions. Data for the FAS evaluation will be collected in farm household baseline and follow-up surveys, based on a household listing exercise in FAS associations/cooperatives. Data collection for the IMCHN evaluation will include CHW baseline and follow-up surveys. Given that IMCHN enrolls CHWs from all rural health centers in Upper Egypt—including FAS communities, farm households in these communities will be automatically exposed to IMCHN interventions. Therefore, the farm household surveys will be also used to assess the impact of IMCHN at the household level. Details on the evaluation designs and their implementation are provided in this Statement of Work (SOW; Section V).

The third specific study objective follows from the research and learning agenda of the FAS-IMCHN impact evaluation study. The spatial and temporal overlap of FAS and IMCHN; the joint project goal of improving maternal and child nutrition in rural areas; and the possible complementarity of IMCHN activities (at the CHW level) and FAS activities under the "agri-nutrition" component (at the household level) provide an excellent opportunity for research to explore synergistic effects. Resulting findings are expected to provide new evidence on how to leverage agriculture-nutrition linkages among smallholder farm households at large scale. However, because FAS and IMCHN are not designed as combined projects with one overarching goal, utilizing potential synergistic effects cannot be used as a criterion to assess project success.

Development Hypotheses and Theory of Change

The five development hypotheses which guide the proposed FAS-IMCHN impact evaluation study directly emerge from the goals and objectives of the projects to be evaluated (Subsection C). In short, the FAS approach assumes that, if on-farm production improves, more efficient post-harvest processes are established, marketing of agricultural crops and products improve, and farm households receive targeted "agri-nutrition" related messages, then farm households' income will increase, their food security will improve, and farmers' and their families' nutritional status—including that of mothers and children—will improve (Subsection C). The IMCHN approach assumes that an improved national strategy for Egypt's CHWs and an improved national training system for the Raedat Refiat program implemented at scale will

improve CHW services delivered to rural households and will lead ultimately to better maternal and child health and nutrition outcomes in these households.[27]

The development hypotheses of the FAS-IMCHN impact evaluation study build upon each other (along the pathways of the theory of change) and are as follows:

1) If the FAS agribusiness-related interventions lead to increased on-farm production, more efficient post-harvest processes (especially through more efficient operation of post-harvest centers), and improved marketing of profitable horticulture crops, the interventions can result in increased income of farm households.

2) If the FAS agribusiness-related interventions lead to increased farm household income and increased farm household access to horticulture crops through their on-farm production, the intervention can enhance household food security (through increased purchasing power and/or home consumption of additional or non-marketable/exportable produce).

3) If the FAS agribusiness-related interventions lead to enhanced household food security and if behavioral change communications—under FAS and IMCHN—lead to changes in household eating habits and intra-household distribution of food, the interventions can result in improved household dietary diversity and increased nutrient intake in the beneficiary farm households and in particular among young children and women.

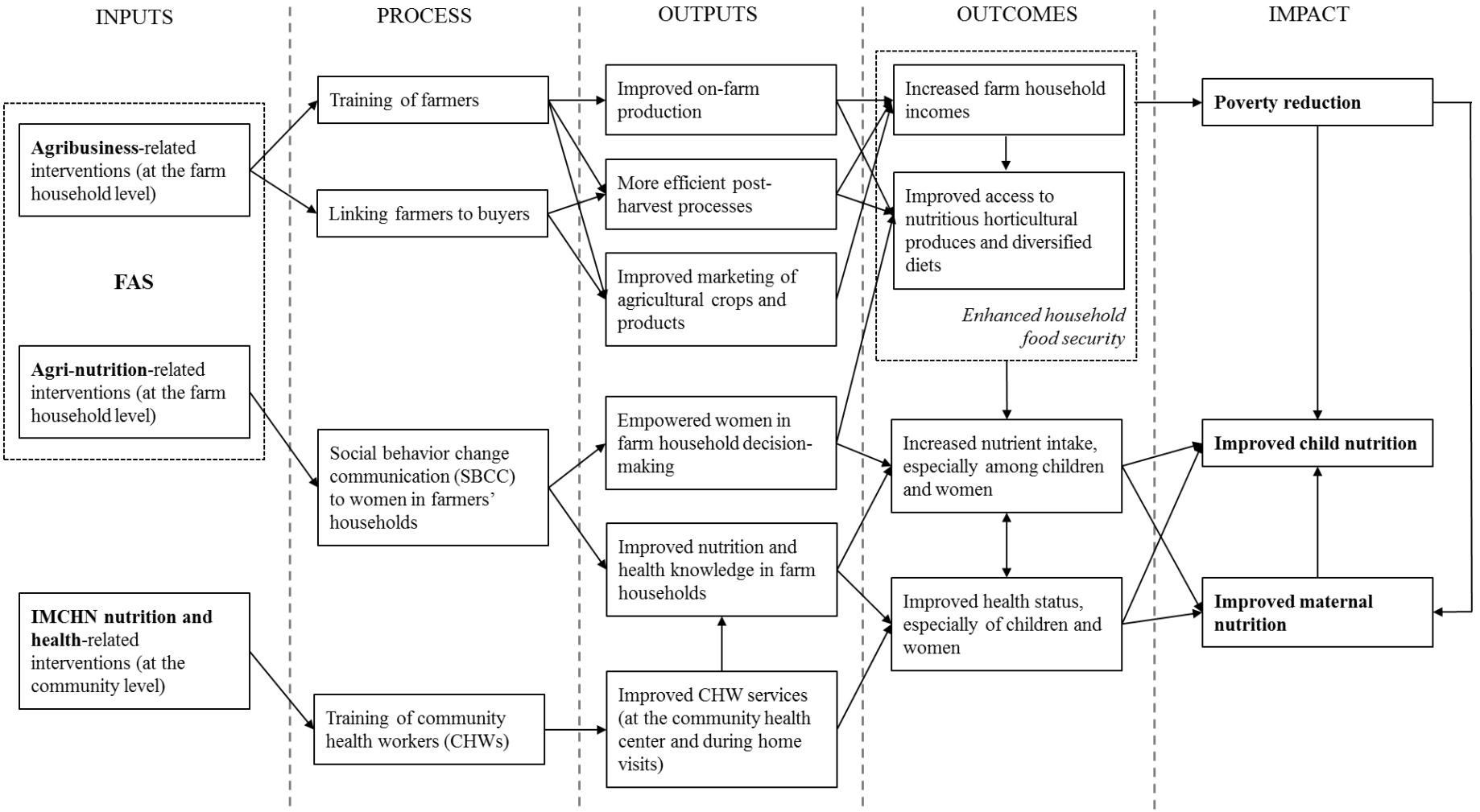
4) If the FAS and IMCHN interventions include specific, need-targeted maternal and child nutrition and health actions, if they focus on empowering women especially regarding farm household decision making (including household decisions on agricultural production patterns, income spending, intra-household resource allocation, use of nutrition and health services, individual care, etc.) and women's autonomy (through e.g. increased control over household resources), and if they lead to increased nutrient intake among young children and women, the interventions can result in improved nutritional outcomes for children and mothers in the beneficiary farm households.

5) If effective health and nutrition-related interventions are combined with effective agribusiness-related interventions, the overall impact is larger than the sum of both impacts, when the interventions are not combined (because of addressing common binding constraints).

Figure 1 illustrates the theory of change that underlies the FAS-IMCHN impact evaluation study. The flow chart shows the most likely pathways through which FAS and IMCHN interventions lead to the expected project outcomes and impact, simplifying complex interrelationships. The theory of change is developed based on the project goals, objectives/components, and activities as defined by the project implementers and in line with the development hypotheses. The theory of change is also consistent with the logical framework of the FAS-IMCHN impact evaluation study (Subsection B).

[27] The Raedat Refiat ("village pioneers") program is the CHW program of the Ministry of Health and Population in rural areas.

Figure 1: Theory of change



Source: Own representation.

Intended Results and Critical Assumptions

The intended results of the FAS-IMCHN impact evaluation study are threefold—corresponding to the specific study objectives: (1) The FAS evaluation is expected to yield reliable estimates of household income, household food security, and child and maternal nutrition indicators among farm households and of statistically significant changes in these indicators over time that are attributable to the FAS interventions. (2) The IMCHN evaluation is expected to yield reliable estimates of indicators of maternal and child health and nutrition knowledge among CHWs and farm households and of statistically significant changes in these indicators over time that result plausibly from the IMCHN interventions. (3) The study intends to produce results on intermediary project outcomes that will help to explain the pathways through which the hypothesized impacts of the projects likely occur and to identify possible agriculture-nutrition linkages facilitated by the overlap of FAS and IMCHN.

There are several critical assumptions that underlie the implementation and the intended results of the FAS-IMCHN impact evaluation study. These assumptions include:

1) There will be measurable effects on project outcome indicators that are attributable to FAS interventions. For effects to be attributable to interventions, the interventions need to be identifiable and specific. For effects to be measurable, they need to occur within the timeframe given by the baseline and follow-up surveys and to be sufficiently large to be captured by the surveys (Section V, Subsection E).

2) The evaluation will be most efficient in capturing the expected project effects, if it is specifically designed around the interventions to be assessed. This requires that detailed and accurate information about these interventions are provided by the implementers on a continuous basis.

3) The evaluation will be most efficient in picking up the expected project effects, if the interventions will be implemented shortly after completion of the baseline survey (Section V). This requires close coordination between the implementers and evaluators and that the implementers will inform the evaluators on any (expected) changes in the planed interventions and timelines. Hence, the timeline of the FAS-IMCHN impact evaluation study (Section VIII) depends on the timelines of the FAS and IMCH interventions to be evaluated.

4) The FAS evaluation will be able to detect statistically significant (existing) effects if the effects are sufficiently large, given a defined minimum sample size for the baseline survey (and the follow-up survey) (Section V). The survey sample size is naturally limited by the number of (comparable) beneficiary farmers that will be eligible for project enrollment and that will be actually enrolled in the project at the same time.

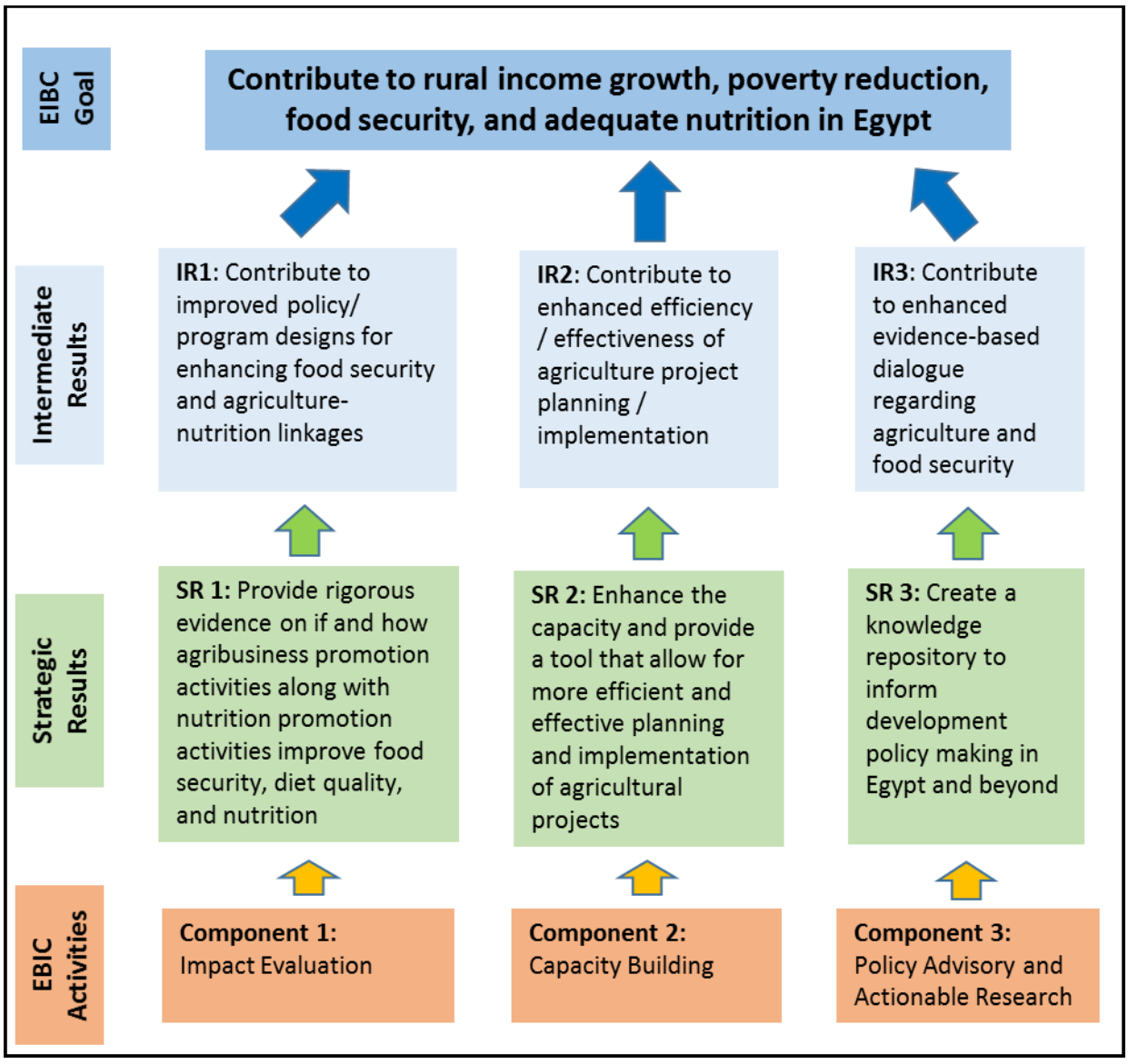
5) The proposed design for the FAS evaluation—using a "randomized promotion" method (explained in section V.B of this document)—will work only if (a) the evaluator's extra promotion strategy is effective; (b) the implementer maintains its own, normal promotion strategy; (c) the promotion only affects the decision of farmers to participate (see Section

V); (d) the promotion minimizes diffusion into the comparison group; and (e) the sample population of eligible households is clearly defined (Section V).

B. **Results Framework**

As part of IFPRI's EIBC, the FAS-IMCHN impact evaluation study follows the EIBC's overall results framework. The results framework was first presented in the EIBC performance monitoring plan (PMP) document (IFPRI 2016). The graphical illustration of the EIBC results framework is shown in Figure 2.

Figure 2: EIBC results framework.



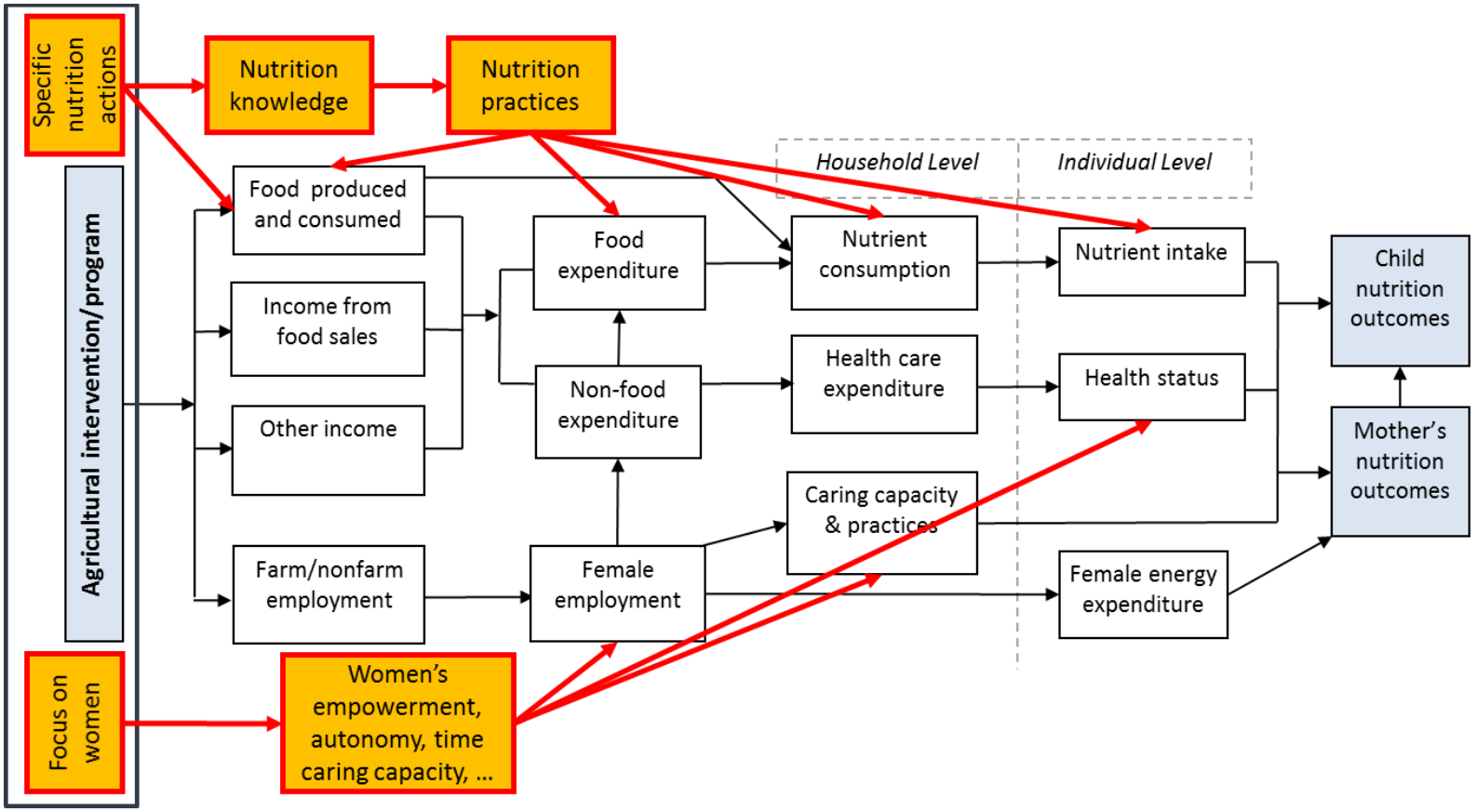
Source: Own representation.

The FAS-IMCHN impact evaluation study (under Component 1) will directly contribute to the first EIBC strategic result (SR 1). The evaluation study seeks to provide rigorous evidence on if and how agribusiness promotion activities along with nutrition promotion activities increase farm household income and improve household food security and child and maternal nutrition among the study population. It is expected that the findings from the study will contribute to improved policy/program designs for enhancing food security and agriculture-nutrition linkages (IR 1) and ultimately to rural income growth, poverty reduction, food security, and adequate nutrition in Egypt (EIBC goal).

The logical framework that underlies the FAS-IMCHN impact evaluation study was first presented in the EIBC work plan document for the first project year (IFPRI 2015). The graphical illustration of the logical framework is shown in Figure 3. It illustrates the pathways that link interventions in agriculture to individual nutrition outcomes.

Agricultural interventions *can* improve nutrition, but it is important to note they do not automatically lead to improved nutrition. In fact, growing evidence from previous impact evaluations of agricultural programs suggest that interventions need specific nutrition goals and actions, and they need to focus on women (e.g., Leroy and Frongillo 2007; Leroy et al. 2008; Ruel and Alderman 2013). Most agricultural interventions—including the agribusiness-related activities of FAS—aim to improve access to and availability of more nutritious foods through increased farm incomes and more nutritious horticultural products available to the households from own-production. However, it is clear from current evidence that *behavioral change* communication (aimed at improving nutrition and health knowledge and practices) is needed to ensure that the improved household food access and at-home food availability is translated into better, high-quality diets for women and children and ultimately lead to improvements in children's and mothers' nutritional status. Necessary behavioral changes include, among others, changes related to household budget allocation; intra-household food allocation; food habits and preferences; meal preparation methods; infant and young child feeding practices; and water, sanitation, and hygiene practices. The IMCHN activities, as well as the nutrition component of FAS, are aimed at achieving these types of behavioral changes.

Figure 3: Logical framework of the FAS-IMCHN impact evaluation



Source: Adapted from Gillespie et al. (2012).

C. Summary of Projects to Be Evaluated

This subsection provides overviews of FAS and IMCHN and describes the project components and activities of both projects that are of particular relevance for the impact evaluation in greater detail.

Food-Security and Agribusiness Support Project (FAS)

FAS is USAID/Egypt's core agriculture activity, with a total USAID funding volume of US$ 23 million. As a project under ARDII, FAS is aligned with USAID's global Feed the Future initiative (FtF). This subsection is based on the FAS project description report (USAID and VEGA 2015), FAS year 2 work plan report (VEGA 2016), and IFPRI's notes of meetings with the prime FAS implementer, as well as complementary documents provided by the prime implementer.

Project Goal, Components, and Targets

The *goal* of FAS is to:

- Increase the incomes of 14,000 Upper Egypt smallholder farmers,
- Enhance food security of farm households, and
- Improve the nutritional status of women and young children.

To achieve this goal over the project period, FAS has four project components:

5) Improved on-farm production;
6) More efficient post-harvest processes;
7) Improved marketing of agriculture crops and products; and
8) Improved nutritional status, especially for women and children.

The project targets include (among others):

- A 12% annualized increase in household incomes in net present value (≈ US$ 380 per household per year) for over 14,000 horticulture-based smallholder farmers;
- Up to 50% of increased yields of selected horticulture crops; and
- Upwards of 36,000 farm families benefiting from nutrition-sensitive messaging.

Project Activities

To realize the project targets, FAS will implement several complementary activities under each project component. The first project component and its farmer training activities are the project's center pieces. The training activities under the first component and the nutrition messaging under the fourth component are targeted directly to individual farm households—the project's target group, while all other activities are directed either to the farmer groups or

other up- or downstream entities of the supply chain and may benefit farm households (only) indirectly.

Component 1: Improving on-farm productivity and income for smallholder farmers

FAS will provide trainings to farmers for production, post-harvest handling, and marketing of selected horticulture crops. FAS will also support the dissemination of innovations, adoption of new technologies, and improved access to inputs through strategic grant support to farmer groups, individual farmers, and input suppliers (starting for the 2017 summer season).[28] In detail, the activities are:

1.1 On-farm training to improve volumes and quality

FAS will develop production training programs for selected horticulture crops. FAS will engage with the identified farmer groups to select qualified, forward-thinking, and influential "lead farmers" (based on pre-defined criteria), who will host trainings, demonstrate new technologies, and facilitate the training. The lead farmers will be trained by FAS agronomists during the agricultural season of the first project rollout phase and is expected to conduct the trainings to other farmers in their farmer groups in the following seasons, with support of the FAS agronomists. Training topics will vary according to the horticulture crops but will always include good production practices like weeding and appropriate use of inputs. Production trainings will also be given to crop rotation strategies, irrigation, and—in some cases—fertigation and chemigation, in addition to trainings on proper harvest techniques and food safety issues (see next activity). FAS will establish demonstration plots on the property of the lead farmers, where the correct use of high-value inputs and equipment (e.g., small tractors; mechanical weeders, seeders/planters, and sprayers; and greenhouses) will be demonstrated to farmers.

1.2 Preparation for successful post-harvest handling

Trainings will be provided to smallholder farmers to increase awareness of the correct harvest time (depending on the maturity of the crops), food safety issues (to encourage refraining from harvesting contaminated, spoiled, or infested produce), and the care needed for appropriate post-harvest handling of horticulture crops.

1.3 Strengthening On-Farm Irrigation Practices

FAS will strengthen the identified farmer groups to develop plans to improve water distribution systems and on-farm irrigation practices. FAS may also provide grants to upgrade irrigation infrastructure (see next activity).

1.4 Promotion of innovative tools and technology

[28] Farmer groups are here defined as farmer associations (registered with the Ministry of Social Solidarity) or farmer cooperatives (registered with the Ministry of Agriculture and Land Reclamation) or subgroups thereof.

During the process of identifying farmer groups and lead farmers, FAS will explore opportunities to introduce innovative, productivity-enhancing tools and technology through targeted grant support. Larger grants may be provided to farmer groups for collective utilization, or smaller grants may be provided to individual farmers. The specific types of tools or technologies (e.g., irrigation system upgrade; modern horticulture machinery) will be identified by FAS and external experts throughout the life of the project.

1.5 Strengthening input suppliers (agro-dealers)

FAS will provide grants to facilitate the establishment of new input suppliers and to support existing ones to provide (additional) services particularly to smallholder farmers supported by the project. Grant support will be provided to (existing) input suppliers for engaging in machinery services and for expanding their facilities to establish demonstration plots adjacent to their shops. Agro-dealers will be trained in sourcing of high-value inputs, appropriate handling and storage of insecticides, business planning, and other relevant topics.

Component 2: Increasing efficiency of post-harvest processes

The activities under the second component focus on the development of horticulture value chains in entities downstream the (on-farm) production level.

2.1 Vertical integration of farmer' groups

FAS will use grants and technical assistance to support farmer groups in diversifying their post-harvest and marketing practices, adding value by engaging directly in effective post-harvest packing, cold storage, and eventually direct export to European markets. In addition, FAS will provide grant and technical assistance support to farmer groups for engaging, where feasible, in agro-processing directly (see next activity).

2.2 Agro-processing enterprise development

FAS will utilize grants to either support the creation or strengthening of agribusinesses that can considerably benefit the development of the selected horticulture value chains.

2.3 Post-harvest facility operator capacity building

Operators of existing post-harvest facilities and entrepreneurs and farmer group representatives developing new facilities will receive capacity building on a series of management-improving methodologies (including trainings, study tours, and on-site coaching) in areas of cooling, packaging, pest control, food safety, and inventory management.

Component 3: Improving marketing of agriculture crops and products

The activities under the third component comprise a set of marketing-related interventions that aim to fill critical gaps that currently impede access to promising export markets, especially in Europe. Fresh-packed horticulture crops supported by FAS will be exported through existing exporter relationships as well as new relationships to be established.

3.1 Association and Farmer Groups Strengthening

FAS will organize farmers from the selected associations—comprising the project's beneficiary farmer groups—to target export markets with highest food quality and safety standards and with volumes attractive to exporters. Together with the farmer groups, FAS will develop implementation plans for each association/cooperative, specifying the types and level of support needed. All farmer groups will be trained in managing a profitable gender-inclusive agricultural business, including record keeping and business planning.

3.2 Forward contracting between suppliers and buyers

FAS will connect farmers and farmer group representatives with potential buyers of the supported horticulture crops in organized meetings to facilitate supply contracts for the next viable production cycle. To strengthen contract adherence, FAS will provide assistance to suppliers and buyers on basic business principles.

3.3 Trade show attendance

To improve access to export markets, FAS will facilitate attendance of farmer group representatives at trade shows in Europe, the Gulf, and Africa.

3.4 Buyer visits

To develop new business relationships with domestic and foreign buyers, FAS will facilitate visits of European wholesalers, importers, distributors, and retail chain owners, as well as aggregators for Egyptian supermarkets, to the farmer groups.

3.5 Expanding Global GAP and Fairtrade certification of farmer groups

FAS' implementing partner Blue Moon will expand its Global Good Agricultural Practices (GAP) and Fairtrade certification work under the USAID/Egypt-funded Premium project to benefit selected FAS beneficiaries. Subgroups of the main project farmer groups (totaling seven farmer groups or subgroups, with more than 2,000 smallholder farmers) will be selected to participate in a comprehensive set of activities that lead to certification. These farmer subgroups will be identified based on their existing good agricultural practices, willingness to improve their practices to meet quality and quantity demands of international markets, and demonstrated ability to effectively cooperate.

Component 4: Improving nutritional status of women and children

While the interventions under the other three FAS components will improve access to and availability of more nutritious foods through increased incomes and more nutritious horticultural outputs, the fourth component will improve utilization of food. FAS will coordinate with the Egyptian National Nutrition Institute and the United Nations Children's Fund (UNICEF) to design and deliver social behavior change communication (SBCC) interventions to improve beneficiaries' awareness of horticulture-based nutrition, nutritional needs (particularly of women during pregnancy and of children during their first two years of

life), and child health, and to promote increased dietary diversity and improved food preparation. FAS refers to these interventions as "agri-nutrition" interventions.

The SBCC interventions will primarily—but not exclusively—consist of strategic messaging through Short Message Service (SMS) to farm families, including all farm households benefiting from the interventions under the other three FAS components. The messages will focus on dietary requirements (especially for pregnant and lactating mothers and children), mitigating food- and waterborne illnesses through improved food preparation, and encouraging diversified diets and the consumption of new horticulture products that recipient household produce.

4.1 Applied nutrition resource toolkit

FAS will adapt an available applied basic agri-nutrition toolkit and its training manual—developed for Kenya (USAID 2013a, b)—to the Upper Egyptian context. The toolkit is a set of large glossy flipcharts which includes information concerning applied nutrition, benefits of healthy eating, effects of poor nutrition, handwashing techniques with soap and water, cooking methods to retain nutrients, recommended serving sizes of different food groups and amounts of water, and breastfeeding recommendations. FAS will train extension agents from the Ministry of Agriculture and Land Reclamation and Community Health Workers (CHWs) from the Ministry of Health to disseminate the information using the toolkit. The toolkit is considered as highly important for the nutrition communication campaign, because many Upper Egyptian women may not have access to SMS messaging.

4.2 Community-based health worker training

To train the CHWs on the use of the toolkit and the dissemination of its information, FAS will utilize the CHW training platform which was established by UNICEF under the Young Child Survival and Development Program. This program is already working to improve the capacity and effectiveness of CHWs in Upper Egypt. FAS will also target specific ICT messages to CHWs to ensure sustainability of the communication campaign.

4.3 Nutrition messaging targeted to women in the agro-processing workforce

FAS will develop nutrition messages targeted to (young) unmarried, working women that educate them—prior to marriage and childbearing—on prioritizing income resources on their own health and nutrition and that of their future children. These messages will be delivered to the respective workforce in the agro-processing enterprises supported by FAS via SMS.

Project Implementation and Rollout

Cultivating New Frontiers in Agriculture (CNFA) is the prime implementer of FAS. CNFA provides contractual accountability; strategic leadership; and technical expertise, specifically in regard to best agricultural practices, access to improved inputs, strengthening farmer groups, improving access to markets, and nutritional messaging; among others. Technical partners of the implementer consortium include Blue Moon, Arizona State University, and Souktel. Blue

Moon is mainly in charge of Global GAP and Fair Trade certification process. Arizona State University conducts value chain, end-market, and cost-benefit analyses for the potential horticulture crops to be supported by FAS and assists CNFA in developing and conducting the baseline and annual follow-up project monitoring and evaluation surveys. Souktel develops the SMS distribution platform.

As implied by the planned FAS activities described above, the main (agribusiness-related) interventions of FAS will be as follows: FAS will provide trainings to farmers for production, post-harvest handling, and marketing of selected horticulture crops. FAS will also support the dissemination of innovations, adoption of new technologies, and improved access to inputs through strategic grant support to farmer groups, individual farmers, and input suppliers. This will be accomplished additionally through identifying potential buyers of the promoted horticulture crops and matching them with farmer groups that produce the crops in the volumes required by the buyer. FAS will facilitate the negotiations between the buyers and farmer groups.

To reach 14,000 smallholder farmers in Upper Egypt over the project lifetime of five years, FAS plans to work with 70 farmer associations or cooperatives each with an average of 200 qualified farmers—forming the farmer groups—in seven governorates (Aswan, Assiut, Beni Suef, Luxor, Menia, Qena, Sohag).[29] FAS is rolled out gradually: 2,000 farmers at the end of the second project year in June 2017 and an additional 4,000 farmers per year until June of each following project year should have been treated by FAS (for at least one full agricultural season). To identify potential FAS beneficiary farmers, the project first selects the farmer group in a two-step procedure. In the first step, a production assessment is undertaken to identify the eligibility of the farmer groups to work with the project. The assessment looks at the size of the farmer groups (in terms of number of members), availability of agricultural infrastructure and resources, ability of farmer collaboration (regarding cost sharing), and major production activities. In the second step, an institutional assessment is undertaken, using a scoring system with predefined criteria. This assessment looks at criteria of farmer groups' production capacity, governance, operational system, human resource management, availability of infrastructure, marketing capacity, financial management, relation with stakeholders, gender issues, ability of cost sharing, prior experience with other donors, and sustainability of farmer group activities. To qualify for FAS support, farmer groups need to reach a minimum overall score; meet critical minimum criteria (including previous experience in horticulture production, at least 20 smallholder farmers producing or willing to produce horticulture, availability of a total of at least 50 feddans for horticulture production, and access to key agricultural equipment); and fulfill several necessary organizational requirements to ensure that the farmer group is ethically governed and has acceptable levels of administrative and financial management. The highest scoring farmer groups are selected for FAS support. FAS signs a memorandum of understanding with each farmer group that clearly defines the terms of cooperation.

[29] According to FAS staff, there may be approximately 500 registered associations in Upper Egypt, out of which 100-120 are farmer associations. However, some of these associations are not operational.

FAS will match the selected farmer groups with selected horticulture value chains to be developed, based on the farmer groups' production capacities, qualifications and farmers' preferences. In Upper Egypt, there are two main agricultural seasons during a one-year period, with a winter season (starting with planting in September or October, depending on the crop) and a summer season (starting with plating in March or April, depending on the crop). Mainly because of different crop heat tolerance and marketing potential of produces, most horticulture crops are typically grown in either the winter or the summer season, and only few during both seasons. Perennial crops, like grapes, are harvested once per year. Hence, depending on the crops selected for FAS support, the number of potential farmers who can be enrolled per season may considerably vary between summer and winter seasons. For (most) vegetables and herbs, the winter season is the main growing season in the southern governorates (Aswan, Luxor, Qena) because of the crops' intolerance to the occurring heat during the summer. Moreover, the profit margins in export markets—especially in Europe—tend to be much larger during the winter season. Thus, the winter season is the main season for FAS large-scale rollout.

It is important to note for the impact evaluation design that farmers are enrolled in FAS on a seasonal basis and based on their interest in producing the crops supported by FAS during that season. The selection of farmers within each FAS farmer group is conducted before the beginning of each season. Thus, a farmer may be participating in FAS in one season but not in the following season(s), and reenrollment of the same farmers in the following seasons(s) is not automatic. Nevertheless, FAS builds on its success to maintain its farmers, in addition to attracting new ones, in subsequent seasons.

For the first (small-scale) rollout phase to the winter season 2016-2017, FAS selected six crops, including onions, green beans, potatoes, anise, herbal fennel, and chili pepper, based on well-known marketing potential and buyers' ability to pre-finance inputs for project farmers. FAS is currently (as of end of January 2017) in the process of determining the remaining horticulture value chains to be supported (approximately 14), which will then be published in a value chain development strategy report. The horticultural products to be supported will be identified through value chain and end market analyses, based on net present value indicator estimates derived from the project baseline survey data, and by consulting available assessments and studies undertaken by other donor-funded horticulture-promoting projects. The horticulture crops will be selected before each season after consultation with potential buyers. Then, FAS will reach out to those farmer groups that are interested and qualified to produce the required product quantities of the identified horticulture crops, with support from the project. FAS will seek for signing forward contracts between the producers and the buyers—on a seasonal basis. The contracts should secure for both parties, through specifying the purchase quantity, price, degree of product quality, and delivery date, among others, prior to the beginning of planting time of each season. Mainly because of different agro-ecological production conditions across Upper Egypt and for project operational reasons, it can be expected that there will be spatial concentrations of the different horticulture crops to be supported to some extent (which is also of logistical advantage for buyers in sourcing the harvested produces).

The individual farmers of the farmer groups will be selected based on their interest and their (minimum) production capacities and (minimum) required qualifications. Within each farmer

group, the lead farmer (who will host and facilitate the FAS trainings and demonstrate the newly introduced technologies on their farms) will be selected based on the following qualifications: The farmer must have a positive and forward-looking attitude, as evaluated by the FAS technical staff; must have demonstrated leadership skills, which will be assessed though interviews with fellow association members; and must have the ability to follow good agricultural practices.

During the winter season 2016-2017—the first (small-scale) rollout phase, FAS has been working with about 300 farmers from 17 associations in three governorates (Aswan, Luxor, and Qena). Meanwhile, FAS has received approval from MOALR to start work in the four remaining governorates (Assiut, Beni Suef, Menia, and Sohag). FAS is in the process of determining the specific associations/cooperatives to work with during the winter season 2017-2018.

All farm households enrolled in FAS, and particularly young women and the mothers of young children, will receive agri-nutrition interventions (FAS Component 4) during the implementation time period of the agribusiness interventions.

Improving Maternal, Child Health and Nutrition Services Project (IMCHN)

IMCHN is a national project under USAID's global Maternal and Child Survival Program (MCSP) and hence shares its ultimate goal. MCSP is implemented in 24 priority countries—including Egypt—to introduce and support high-impact health interventions. IMCHN's anticipated level of USAID funding is US$ 3.5 million over the project lifetime. This subsection is based on the IMCHN implementation plan report (Jhpiego et al. 2016), Raedat Refiat assessment report (Abdelmegeid et al. 2016), and IFPRI's notes of meetings with IMCHN managing officer at USAID/Egypt and the prime implementer in Egypt.

Project Goal and Objectives

MCSP's ultimate *goal* is to end preventable child and maternal deaths within a generation. To contribute to this global goal, IMCHN has two project objectives:

1) To develop a national strategy for Egypt's Community Health Workers (CHWs) that reflects the Family Health Package of the Ministry of Health and Population (MOHP) and will support MOHP in reaching the targets of the Sustainable Development Goals (SDGs); and
2) To develop a national training system for the Raedat Refiat program and implement at scale in all nine governorates of Upper Egypt.

Project Activities and Expected Results

IMCHN includes two phases. The first phase was initiated in April 2015, and the second phase started in April 2016 and will end in March 2018. The outcome of the first phase is the assessment report of the Raedat Refiat program. The second phase of IMCHN aims to address some of the shortcomings found by the assessment and therewith to (a) support MOHP's Family Health Package and (b) contribute to MOHP's effort to achieve relevant SDG targets. In doing so, IMCHN will draw upon lessons learned and tools and guidance developed under its predecessor project—the Community-based Initiatives for a Healthy Life project (SMART) (MCHIP 2014).

Out of the 11 recommendations for improving the Raedat Refiat program presented in the assessment report, the following four recommendations were selected for implementation under IMCHN in a consultative process with MOHP:

a) Confirm or reverse the strategic direction of the Raedat Refiat program toward a full family health strategy;
b) Establish explicit strategic goals, objectives, and performance management indicators;
c) Provide practical and operational guidance to the Raedat Refiat at governorate level, in order to more strategically balance their activities between home visits and community outreach, and mobilization and support of community groups for health promotion and social change; and
d) Establish, resource, and implement a training strategy adapted to the ambitions of the Raedat Refiat program.

The first two recommendations (a, b) will be implemented through the course of national strategy development, under Objective 1. The last two recommendations (c, d) will be implemented by developing a national training system and establishing it in all nine governorates of Upper Egypt, under Objective 2. Objective 2 activities are more likely to benefit people's nutrition and health status directly.

The expected results of Objective 2 activities include:

- New Raedat Refiat curriculum developed and disseminated;
- Operational guidelines, including Raedat Refiat job description and core competencies, developed and disseminated;
- Human resource capacity improved, including establishment of 60 "master trainers" for all governorates of Egypt; and
- Raedat Refiat training system implemented at scale in all nine Upper Egypt governorates, specifically:
    - 50 "lead trainers" established,
    - 600 supervisors and managers trained on providing supportive supervision and managing the Raedat Refiat program according to new operational guidelines, and
    - All 5574 Raedat Refiat from the nine governorates trained using new curriculum and operational guidelines.

Project Implementation and Rollout

IMCHN is implemented by several MCSP organizations, including Save the Children, ICF International, Jhpiego, and PATH. Save the Children is the lead implementing partner in Egypt. MCSP will operate in Egypt as a single entity.

The new Raedat Refiat training curriculum, modules, and materials are developed from July 2016 to March 2017 and will be finalized by the end of June 2017. The trainings are expected to include a comprehensive list of nutrition and health topics, especially related to maternal and child health. The list of topics includes: (1) infant and childhood; (2) adolescence; (3) reproductive period, including (a) antenatal care, (b) delivery, (c) post-partum care, (d) family planning methods, (e) post-partum and post abortion family planning, (f) emergency family planning, (g) men's role in family planning utilization, (h) reproductive tract infections, and (i) sexually transmitted diseases; (4) post-menopausal period; (5) healthy life styles; (6) chronic diseases; and (7) zoonotic diseases. Because child stunting and overweight/obesity among both children and women are major public health problems in Egypt—as pointed out by the Raedat Refiat assessment report, among many other publications, it can be expected that appropriate infant and child feeding practices, dietary diversity, and adequate nutrition will become focus topics in the trainings.

To train all Raedat Refiat in the nine governorates in Upper Egypt, a four-stage training approach is applied. First, MCSP staff, together with MOHP staff, will select 60 MOHP staff members from all governorates in Egypt for training as master trainers, and MCSP staff will train them during the period January – March 2017. Master trainers will receive follow-on technical support and coaching from MCSP and MOHP staff at least until the end of the project. Second, MCSP staff and master trainers will conduct one training course in each of the nine Upper Egypt governorates to develop 50 lead trainers during the period January – June 2017. Master trainers will provide follow-on technical support, coaching, and mentoring to lead trainers at least until the end of the project. Third, lead trainers will conduct trainings of approximately 600 Raedat Refiat supervisors and managers within the nine Upper Egypt governorates during the period January – June 2017. Lead trainers will provide follow-on technical support and coaching to Raedat Refiat supervisors and managers at least until the end of the project. Fourth, Raedat Refiat supervisors and managers, with support from lead trainers, will train all Raedat Refiat in the nine Upper Egypt governorates (approximately 5,500 individuals) during the period July 2017 – March 2018, probably starting after end of Ramadan (at the end of June). The training will be conducted over a six-month period, with one day of training per month, held at the primary health unit. Raedat Refiat supervisors and managers will provide follow-on technical support and coaching to the Raedat Refiat at least until the end of the project. Each Raeda Refia is responsible for an average of 500 families and expected to conduct a very ambitious 160 home visits per month or 8 home visits per day (in a five-day working week). The Raedat Refiat are instructed to give priority to households with expecting mothers and mothers with young children. The newly acquired knowledge should be communicated to the families, as soon as received. Hence, it can be expected that the potential, immediate impact of the improved Raedat Refiat program will occur during the period July

2017 – July 2018 (depending on the schedule of the specific training modules and conducted home visit dates).

D. Summary of the Projects' M&E Plan

For developing the study design and work plan of the FAS and IMCHN evaluations presented in this Statement of Work (SOW) document, IFPRI exploited all currently available project documents, utilized information from meetings with the FAS and IMCHN implementers and USAID/Egypt, consulted USAID FtF handbooks and guideline documents, and harnessed relevant, state-of-the-art findings from the literature on impact evaluations and agriculture-nutrition linkages. All used sources (with the exception of IFPRI meeting notes) are quoted throughout the text of this SOW document and listed in the reference list (Section XI).

Key FAS and IMCHN documents include:

Abdelmegeid, A., A. Brasington, E. Sarriot, R. Taylor, N. Hassenien, O. Yehia, and A. Assran. 2015. "Maternal and Child Survival Program, Egypt: Raedat Refiat Assessment Report." USAID (United States Agency for International Development), Washington, DC.

Jhpiego, John Snow Inc., Save the Children, ICF International, Results for Development, Population Services International, et al. 2016. "Maternal and Child Survival Program, Egypt: Implementation Plan." USAID, Washington, DC.

USAID (United States Agency for International Development) and VEGA (Volunteers for Economic Growth Alliance). 2015. "Egypt Food Security and Agribusiness Support (FAS): Cooperative Agreement, Attachment B – Program Description." USAID, Washington, DC.

VEGA. 2016. "Feed the Future Egypt, Food Security and Agribusiness Support Project: Year 2 Workplan." VEGA, Washington, DC.

There are several project implementer documents forthcoming that are important for the design of IFPRI's impact evaluation study and the implementation plan of the baseline survey. They include the following documents, in addition to various, other complementary materials:

- FAS baseline report;
- FAS value chain development strategy report;
- FAS (detailed and updated) M&E plan;
- FAS farmer training manuals and training schedules;
- List of FAS farmer associations/cooperatives to be targeted for enrollment in winter season 2017-2018;
- IMCHN Phase 2 (detailed and updated) M&E plan; and
- IMCHN Raedat Refiat training manuals and training schedules.

IV. EVALUATION QUESTIONS

The FAS-IMCHN impact evaluation study seeks to answer five *evaluation questions*: two *primary* evaluation questions and three *secondary* evaluation/research questions. The primary evaluation questions directly emerge from the project goals and objectives, as defined by the project implementers. Hence, answering the primary evaluation questions will serve to help USAID in assessing the success of FAS and IMCHN (individually) relative to the stated project outcomes. The secondary evaluation questions will serve to generate a better understanding of the impact pathways and to identify possible agriculture-nutrition linkages facilitated by the overlap of FAS and IMCHN. Hence, answering the secondary evaluation questions will help to explain why (or why not) and how the observed changes in project outcome indicators occurred and how synergies between agriculture and nutrition interventions can arise. The primary evaluation questions address the first two specific study objectives, and the secondary evaluation questions address the third specific study objective (Section III, Subsection A).

The primary evaluation questions are:

1) What is the impact of FAS interventions on household income (measured by total household expenditure), household food security, and maternal and child nutrition among smallholder farm households in Upper Egypt?

2) What is the impact of IMCHN interventions on maternal and child health and nutrition knowledge of community health workers (CHWs) in rural Upper Egypt?

The secondary evaluation/research questions are:

3) What are the effects of FAS interventions on intermediary project outcomes, including indicators of farm production and output, household food consumption and dietary diversity, and mothers' and children's diets?

4) What is the impact of IMCHN interventions on maternal and child health and nutrition knowledge among smallholder farm households in Upper Egypt?

5) What are the synergistic effects among smallholder farm households being exposed to both FAS and IMCHN interventions?

V. EVALUATION DESIGN AND METHODOLOGY

A. Overview of the Evaluation Design

Historically program/project effectiveness has been measured using *adequacy* designs, which are limited to describing whether or not the expected changes and/or targets were achieved. This type of design does not allow the attribution of impact to the specific intervention being evaluated (or to infer a causal relationship between the program/project and the outcomes). Measurements are limited to the program/project recipients or target population. In recent years, however, the increased demand for evidence-based programming (Habicht et al. 1999) has led to the search for more rigorous, yet feasible, evaluations using *probability* or *plausibility* designs. These types of designs do allow for attribution of impact to program/project interventions when implemented with appropriate rigor:

- The most rigorous evaluation design is the *probability* or *experimental* design, which randomly allocate the intervention to treatment and comparison individuals (Habicht et al. 1999). They are considered the gold standard for impact evaluation. This design allows for attribution of impact to the program/project.

- A *plausibility* design uses a non-experimental comparison group to minimize the possibility that the observed changes are due to non-intervention related factors.

The key challenge to impact evaluation is to determine what would have happened in the absence of the program/project, which is referred to as the *counterfactual*. The counterfactual is constructed by finding a *comparison group* that is similar to the group receiving the intervention—the *treatment group*—on all relevant characteristics, except for receiving the intervention (Gertler et al. 2010; Khandker et al. 2010; White 2013).

The FAS-IMCHN impact evaluation study will include two complementary evaluation designs. The proposed evaluations designs are: an *experimental cohort* (also known as "*panel*") design—with randomization at the individual farm household level within each farmer group —for the FAS evaluation; and a *plausibility* design for the IMCHN evaluation. A cohort design means that households will be followed over time: they will be assessed in a survey at baseline, that is, before the interventions have been implemented, and again in a follow-up survey. To implement randomization over households, IFPRI proposes a *randomized promotion* method, which was identified as the most feasible, ethically acceptable, and rigorous impact evaluation method—after extensive consultations with the prime implementer of FAS.[30] The randomized promotion method is described in the next subsection in greater detail.

[30] IFPRI considered several other impact evaluation designs and discussed their feasibility and acceptability with the FAS implementer in great detail. The discussed designs included randomization of treatment at the individual farm household level ("randomized control trial, RCT"), randomization of treatment at the farm association/cooperative level ("cluster RCT"), project oversubscription with randomized phase-in (implying randomization over time), and regression discontinuity design (that is, a non-experimental evaluation method

Given the nature of IMCHN, randomization over community health workers (CHWs) or households to either receiving or not receiving the intervention is not feasible. Therefore IFPRI proposes to assess the impact of IMCHN using a panel of CHWs and a panel of households: CHWs' maternal and child health and nutrition knowledge will be assessed in a survey at baseline, that is, before the respective IMCHN trainings have been conducted, and again in a survey after the trainings have been completed. These surveys will be conducted with CHWs in health centers of communities that will also receive FAS interventions. Changes in mothers' health and nutrition knowledge will be assessed using the household baseline and follow-up surveys that will also be used for the FAS evaluation. For assessing the effects of IMCHN, baseline outcomes will thus be used as the counterfactual. The prime implementer of IMCHN agreed to coordinate with IFPRI on the timing of implementing the CHW trainings related to maternal and child health and nutrition for the communities under the evaluation. The timeframe of the household-level assessment is given by the FAS evaluation.

B. Randomized Promotion Method for FAS Evaluation

Randomized promotion or encouragement method is a creative strategy for evaluating projects in contexts where it is not acceptable for some households not to receive (or even partially receive) an intervention and/or receive the intervention at different points in time. Hence, instead of randomizing the assignment of project treatment (i.e. randomizing who gets the FAS intervention and who does not), a random group of the eligible population receives "extra promotion"— to be implemented by the project evaluators (Duflo et al. 2008).

By "extra promotion", we intend to introduce another layer of "encouragement" to the farmers to participate in the FAS program. This means that all farmers will receive the information that FAS team gives on the program; from FAS. Then, IFPRI will randomly select some farmers to receive more information on FAS – to be done in close coordination with FAS. Adding an additional layer of project promotion or participation encouragement to eligible households—in addition to the normal project promotion by the implementers—is expected to significantly increase project take-up. The promotion method can be beneficial particularly to implementers of projects with large target beneficiary populations and limited take-up rates, because it is likely to increase project enrollment at no cost to the implementers (like FAS in our case).

For analysis purposes, the group of "non-promoted farmers/households" will serve as the comparison group, and the "promoted farmers/households" will serve as the treatment group.

requiring strict eligibility criteria). For mainly practical reasons/concerns highlighted by the FAS implementers these designs were not further considered.

In the unlikely case that the implementation of the proposed experimental design with randomized promotion is not feasible (e.g. because of currently unknown practical reasons or if new information emerges indicating that this experimental design will likely yield statistically weak results, IFPRI will (have to) adopt a less-rigorous, non-experimental ("plausibility") design for the FAS evaluation. The most feasible design then will likely have to rest on propensity score matching methods with implications on survey design.

Both groups will have FAS participating households and non-FAS households. Yet, the "promoted" group will have a significantly higher share of FAS households. The impact estimation methodology, thus, exploits the variation in outcomes between the group of "non-promoted households" and the group of "promoted households", introduced by the households who enrolled into the project because of the extra promotion (Gertler et al. 2011). In other terms, by comparing the "non-promoted" group (comparison group) with the "promoted group" (treatment group), we expected to see differences in outcomes, as an impact to the higher program enrollment due to the extra promotion we introduce. For instance, assuming success of the program in increasing incomes, due to the higher share of the FAS household in the "promoted group", we expect to see higher income increase for the "promoted group" compared to the "non-promoted" group, since the "non-promoted" group has less FAS participants.

This evaluation approach needs to meet five critical conditions for the methodology to produce a valid impact assessment:

9) The extra promotion strategy must be effective. That means that the promotion campaign must substantially increase project enrollment among eligible households of the promoted group (above the rate of the non-promoted group) and eventually the number of project beneficiaries.

10) The project implementer must maintain its own, "normal" promotion strategy throughout the evaluation timeframe. The implementer must not take over (parts of) the evaluator's extra promotion strategy or adjust their normal promotion strategy.

11) The promotion itself must be chosen in a way that it does not directly affect the project outcomes to be evaluated. It also should not include clear tangible benefits to avoid any potential tension or conflict between promoted and non-promoted households.

12) The promotion must be chosen in a way that it is exclusionary and minimizes diffusion into the non-promoted group.

13) The sample population must be clearly defined. This means that the households eligible for project enrollment—with eligibility defined by the implementer—can be identified.

Implementation of the Evaluation Design

Extensive consultations with the FAS prime implementer and field visits to project sites revealed that (a) farmers are enrolled into FAS on a seasonal basis and based on their interest in producing the crops supported by FAS during that season; (b) initial FAS take-up is lower than initially expected; (c) FAS will not reach capacity constraints for enrollment of eligible farmers and will be able to provide equal treatment to all enrolled farmers; (d) FAS' criteria for defining eligibility of farmers tend to vary depending on farmer groups, supported value chains, and agricultural seasons; and (e) lists of (potentially eligible) farmers are unavailable. In addition to the rationale for choosing the randomized promotion method, these project

realities have at least three important implications for the implementation of the evaluation design:

1) The main timeframe of the impact evaluation is one agricultural season, with a farm household baseline survey to be implemented before the beginning of FAS interventions, a first follow-up survey after the agricultural season and a second follow-up survey after/near completion of FAS agribusiness interventions.

2) A farm household listing exercise is necessary to define the sample population of the evaluation. The household listing will collect names, contact details, and relevant basic farm characteristics of farmers who are interested in enrolling in FAS for the season under evaluation. The collected data will be used to define sampling strategy and final sample size of the baseline household survey and to randomly assign farmers to receiving or not receiving the extra promotion for project participation.

3) The precise promotion strategy (which according to preliminary discussions with the FAS implementers could consist of phone calls) will be determined in close collaboration with the FAS implementer. For example, if phone calls are chosen, then the randomly selected farmers (in the treatment group, i.e. ”promoted group”) would receive phone calls from IFPRI (or from personnel hired by IFPRI) to promote the FAS program to the farmers and encourage them to participate in FAS. Farmers could either receive extra information about the program, or the same information but with higher frequency. The promotion will be carefully tested in field trials and based on FAS consultation.

In addition to this randomized promotion design as the main impact evaluation method, IFPRI will implement a third farm household survey (second follow-up survey) in the FAS communities under evaluation one year after the first-follow up survey to be able to track changes in outcome indicators until the (near) end of the FAS project.

C. Study Outcomes

Corresponding to the study’s evaluation questions (Section IV), the impact evaluation will assess the effects of FAS and IMCHN on a number of primary and secondary outcomes. The primary outcomes of the FAS evaluation are: [31]

[31] Although “improve the nutritional status of women and young children”—typically measured by anthropometric indicators—is a stated FAS goal (Section III, Subsection C), IFPRI suggests not to consider anthropometric measurements as primary outcome indicators. This is because FAS is unlikely to achieve measurable changes in anthropometric indicators within the evaluation timeframe, and thus sample size calculations based on these indicators would yield very large survey sample sizes that are extremely difficult to implement. Instead, we suggest to use blood hemoglobin concentration—which is much more responsive to changes in diets and health conditions—as a primary outcome indicator. Anthropometric measurements will be collected as secondary outcome indicators.

1) *Household expenditure*: Total household expenditure will be used as a proxy for household income. Household expenditure is easier to collect than household income and generally considered a more accurate measurement for household income than measuring household income directly, since people are usually less reluctant to report household expenditure than income. Additionally, households usually tend to under-report income.

2) *Household food security*: The Household Food Insecurity Access Scale (HFIAS)—developed by USAID's Food and Nutrition Technical Assistance project (FANTA) (Coates et al. 2007)—will be used to assess household food security. Scores are assigned to a set of nine questions (that are, worry household would not have enough food; unable to eat preferred foods; eat limited variety; eat unwanted foods; eat smaller meals; eat fewer meals; no food to eat in your household; go to sleep at night hungry; go a whole day and night without eating), based on the frequency of occurrence (that is, never=0; rarely=1; sometimes=2; often=3) over the past four weeks. The sum of these responses is the household score (with a range from 0 to 27). A complex tabulation plan classifies households as food secure, mildly food insecure, moderately food insecure, or severely food insecure.

3) *Maternal nutritional status*: Maternal hemoglobin (Hb) level will be collected using a portable Hemocue analyzer. Anemia will be defined as having Hb concentrations less than 12 gram/deciliter (g/dl) in non-pregnant women and less than 11 g/dl in pregnant women; severe anemia will be defined as Hb concentration less than 8 g/dl for non-pregnant women and less than 7 g/dl for pregnant women (WHO 2011a, 2011b).

4) *Child nutritional status*: As for mothers, Hb level will be determined using a portable Hemocue analyzer. Anemia will be defined as having Hb concentrations less than 11 g/dl in children; severe anemia will be defined as Hb concentration less than 7 g/dl (WHO 2011a, 2011b).

The secondary outcomes of the FAS evaluation are:

5) *Farm production and output*: Farm production will be assessed by harvested yields. Farm output will include quantities sold, selling prices, and quantities used for home consumption. Production and output will be surveyed on a crop-by-crop basis for all crops—including the FAS-supported crops—cultivated during the season under evaluation.

6) *Household dietary diversity*: The Household Dietary Diversity Score (HDDS)—developed by FANTA (Swindale and Billinski 2006)—will be used to assess household-level dietary diversity. The food preparer in each household will be asked if the household consumed food from list of 12 pre-defined food groups in the past 24 hours prior to the interview, providing a simple score ranging from 0 to 12.[32]

[32] The 12 HDDS food groups are: cereals and grains; roots and tubers; legumes, nuts, and pulses; milk and dairy products; eggs; meat and poultry; fish and seafood; fruits; vegetables; oils and fats; sugar, honey, sweets and snacks; miscellaneous.

7) *Mother's dietary diversity*: The Minimum Dietary Diversity – Women (MDD-W) score—developed by FAO and FANTA (FAO and FHI 360, 2016)—will be used to assess dietary diversity by mothers. The methodology of the score resembles that of the HDDS.

8) *Infant and Young Child Feeding (IYCF) practices*: A standardized survey module—developed by WHO, FANTA, IFPRI, and others (WHO et al. 2010)—will be used to assess IYCF practices. The module includes a set of indicators including indicators related to children's dietary diversity.

9) *Nutrition knowledge*: Mothers will be asked a series of questions to assess their knowledge of danger signs of poor child nutrition, and knowledge of recommended diets and unhealthy diets. The outcomes will be specified, once the training materials of the FAS agri-nutrition component become available to IFPRI.

10) *Adult and child anthropometry:* Weight and height measurements (and age for children) will be used to construct standard indicators of nutritional status, including body-mass-index (BMI) for adults and height-for-age z-scores (HAZ), weight-for-age z-scores (WAZ), weight-for-height z-scores (WHZ), and BMI-for-age z-scores (BMIZ) for children. These indicators will be used to determine the prevalence rates of chronic, acute, and overall undernutrition (for children) and the prevalence rates of overweight and obesity in the sample population.

The primary outcome of the IMCHN evaluation is:

Nutrition and health knowledge: Community health workers (CHWs) and mothers will be asked an identical series of questions that will be specified once the IMCHN CHW training materials will become available. This series will include questions that resemble to the questions for FAS Outcome 9 and questions related to knowledge regarding appropriate IYCF practices (breastfeeding and complementary feeding), optimal hygiene practices for the prevention of diarrhea; knowledge of danger signs of malnutrition and illness during pregnancy and childhood; and knowledge of health risks associated with overweight and obesity.

The secondary outcomes of the IMCHN evaluation are identical with the FAS Outcomes 6-10 in addition to:

Health care utilization: Preventive and curative healthcare knowledge will be assessed as reported by mothers. They will be evaluated in relation to national recommendations and/or the IMCHN recommendations to mothers.

D. Household Survey Sample Size

Sample size requirements of the farm household surveys are calculated for all primary outcomes of the FAS evaluation. The primary outcomes of this study are household expenditure, household food security, maternal and child nutritional status.

Sample size calculations will be based on the estimated impact of FAS using the differences expected to be found between farm households receiving the extra promotion for FAS participation and those not receiving the extra promotion. Precisely, the expected impact will occur due to the subgroup of promoted and enrolled households that only enrolled because of the promotion.

The sample size will be calculated using the following parameters: 0.05 probability of a type I error and a power of 0.90. Note that that the power of 0.90 (higher than what is typically used) is used since this is a proof-of-concept study. IFPRI thus want to minimize the risk of not detecting a project effect by underpowering the study. No adjustments will be made for intra-cluster correlation because the promotion will be individually randomized. Autocorrelation (the extent to which measurements are correlated over time within a household) are taken from the literature for household expenditure (Mc Kenzie 2012) and from data from previous IFPRI projects for the other primary outcomes.

Preliminary calculations conducted on the four primary outcomes indicate the following:

- Detecting an increase in household expenditure of 6% requires a sample size of 1,529 farm households in the treatment group and an equal number of farmers in the comparison group.[33]

- The above number of farmers will be increased to allow for the expected effectiveness of the randomized promotion, the potential refusal of farmers to participate in the study, and the potential loss to follow-up (that is, farmers in the baseline survey who do not or cannot participate in the follow-up survey).

- Sample sizes required to detect meaningful effects in the other primary outcomes are smaller than those required for household expenditure. As a consequence, the sample size required for the study will be based on household expenditure. IFPRI will subsequently calculate the statistical power this sample size provides for the other outcomes.

The final sample size will also determine how many farmer groups will need to be included in the study. The selection of farmer groups will be discussed and agreed upon with the FAS implementer.

E. Data Collection and Indicators

Household Listing and Baseline Survey Data Collection

[33] Note that this only half of FAS's target of a 12% increase. Detecting an impact of 12% requires a smaller sample size, but is risky as it would not allow the evaluators to detect effects that are smaller than 12%. If for instance, the program has an impact of 10% (which is substantial from a policy perspective), IFPRI would not be able to detect it if the study is powered for a 12% impact.

After a competitive search and in line with IFPRI's corporate rules, IFPRI has pre-selected El-Zanaty and Associates for the data collection of the farm household listing and the farm household baseline survey (and follow-up survey). El-Zanaty and Associates is a very experienced, registered Egyptian survey firm (which has implemented all Demographic and Health Surveys (DHS) in Egypt since the early 1990, among many other surveys in Egypt and other countries). Because of El-Zanaty and Associates' extensive experience from DHS data collection, IFPRI considers the survey firm particularly qualified in measuring anthropometric indicators and other health and nutrition-related indicators.

The scope of work of El-Zanaty and Associates includes tasks regarding four major activities of the baseline survey data collection process: (1) planning, preparation, and coordination; (2) training of interviewers, anthropometrists, controllers, and supervisors; (3) data collection; and (4) data management. The precise tasks will be detailed in a Terms of Reference (TOR) document. All tasks will be conducted in close collaboration with and strict and constant supervision by IFPRI. El-Zanaty and Associates will obtain the required ethical approvals for all staff involved in data collection and processing. El-Zanaty and Associates will also assist IFPRI in acquiring all approvals required for data collection of the household listing and the baseline survey.

The blood samples for measuring Hb concentration (to detect anemia) will be carried out by trained and certified health professionals.[34] El-Zanaty and Associates will be in charge of their recruitment and their training will be under strict supervision by IFPRI. The field staff will be trained on the proper procedure for taking the sample and measuring the Hb concentration using the portable Hemocue machines. Training will include the proper techniques for sterile sample collection including the use of a sterile lancet and a new set of sterile gloves for each sample. The staff member will use an alcohol swab to clean the area to be pricked both before and after the procedure and also apply a small bandage when finished. Each enumerator will be supplied with a small plastic container to collect the waste from the procedure. The enumerators will also be trained in the correct techniques to collect the blood sample in the micro-cuvette to minimize the need to repeat the procedure.

Questionnaires

The farm household baseline and follow-up surveys will comprise three questionnaires: household, farm, and anthropometry. The baseline and follow-up surveys will be largely identical, with the exception of some questions that ask for specific interventions received by FAS and IMCHN. During the interviews, the questions of the household questionnaire will be asked to any well-informed adult household member—preferably the household head—and to the mother (or caregiver) of the children (ages 0-59 months), depending on the questionnaire module. The respondent for the farm questionnaire will be the main farmer in the household.

[34] The IFPRI team has ample experience with the collection of these types of samples. As for each survey IFPRI conducts, the exact profile of the field staff conducting the Hemocue measurements will be based on local rules and regulations.

Anthropometric measurements and blood samples of the selected individuals will be taken toward the end of the household interview, using the anthropometric questionnaire. The questionnaires will include the following modules:

Household questionnaire:

- Cover (with household contact details and GPS coordinates; interview completion information; interviewer, controller, and supervisor information)
- Letter of introduction and consent
- Household roster (incl. household members' relationship to household head, marital status, and education level; identification of household members selected for anthropometry questionnaire)
- Housing conditions (incl. roof and wall material; water and sanitation; use of bed nets)
- Household assets
- Employment and (off-farm) income sources
- At-home food consumption (seven-day recall)
- Outside-home food expenditure (30-day recall)
- Non-food expenditure for non-durables (30-day recall)
- Non-food expenditure for durables (12-month recall)
- Household dietary diversity: Household Dietary Diversity Scale (HDDS)
- Household food security: Household Hunger Scale (HHS) / Household Food Insecurity Access Scale (HFIAS)
- Infant and child feeding practices
- Mother's health and nutrition knowledge
- Mother's dietary diversity: Minimum Dietary Diversity – Women (MDD-W)
- Nutritional and health awareness (incl. perception on overweight/obesity)
- Household's participation in social protection and development programs (incl. food subsidy system; current and past programs by USAID and other international development/assistance agencies)
- Use of community health programs and services
- Women Empowerment in Agriculture (WEIA) index
- Conclusion

Farm questionnaire:

- Cover (with household contact details and GPS coordinates; interview completion information; interviewer, controller, and supervisor information)
- Letter of introduction and consent
- Farm characteristics and assets
- Farm production and output by cultivated crop (incl. yields, sales, selling price, home consumption; to identify FAS interventions)
- Agricultural practices and marketing (to identify FAS interventions)
- Participation in FAS training activities
- Conclusion

Anthropometry and hemoglobin questionnaire:

- Cover (with household contact details and GPS coordinates; interview completion information; interviewer, controller, and supervisor information)
- Letter of introduction and consent for anthropometric measurement
- Anthropometry for children (0-59 months)
- Mother's and father's anthropometry
- Letter of introduction and consent for blood sample
- Blood sample for children (0-59 months)
- Mother's and father's blood sample
- Conclusion

Indicators

The baseline and follow-up surveys will be designed to collect data for a large set of standard (S), required (R), and required-if-applicable (RiA) FtF program indicators for the sample population(s), in addition to other key indicators (Table 3).

Table 3: FtF and other proposed indicators

Indicator	Category
Number of hectares of land under improved technologies or management practices as a result of USG assistance	RiA
Number of farmers and others who have applied improved technologies or management practices as a result of USG assistance	RiA
Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	RiA
Women's Empowerment in Agriculture Index	R
Number of children under five reached by USG-supported nutrition programs	S
Child nutrition (prevalence of stunted/wasted/underweight/overweight/obese children under five years of age)	R/N
Prevalence of anemia (among children 6-59 months and among women of reproductive age)	S/RiA
Women nutrition (prevalence of underweight/overweight/obese) men and women	R/N
Prevalence of children 6-23 months receiving a minimum acceptable diet	RiA
Women's Dietary Diversity: Mean number of food groups consumed by women of reproductive age	S
Household Dietary Diversity: Mean number of food groups consumed by the household	N
Prevalence of households with moderate or severe hunger	RiA
Prevalence of exclusive breastfeeding of children under six months of age	RiA
Prevalence of Poverty: Percent of people living on less than $1.25/day	R
Daily per capita expenditures (as a proxy for income) in USG-assisted areas	R
Number of maternal and child health and nutrition messages acquired by household mothers	N
Number of maternal and child health and nutrition messages acquired by CHWs	N

Source: Own representation based on USAID (2012, 2014) and Malapit et al. (2014).
Note: S = standard, R = required, RiA = required-if-applicable, N = non-FtF indicators.

F. Data Analysis

Assessing the Impact of FAS Interventions

The impact of FAS interventions will be estimated using the data from the baseline survey and the (first) follow-up survey. A sample of randomly selected farm households that are eligible for FAS enrolment will be surveyed, at baseline (that is, before the start of FAS interventions in the specific season). The identification of eligible households and the sample selection will be conducted beforehand—based on the household listing exercise. Selected farm households surveyed in the baseline survey will then receive extra promotion to encourage them to participate in FAS activities. These farm households will be surveyed in the follow-up survey again (after the FAS interventions in that season have been completed).

At follow-up, both the group of promoted households and non-promoted households comprise two subgroups of households: one subgroup of households who would likely *never enrol* in the project—irrespective of the extra promotion; and one subgroup of household who would likely *always enrol* in the project—irrespective of the extra promotion. The group of promoted households comprise a third subgroup of households: those who *enrol-if-promoted* through the extra promotion campaign.

The impact under a randomized promotion design is estimated in two steps. The first step is to estimate the mean difference in an outcome between the promoted group and non-promoted group for households that actually enrolled in the project. The second step is to recover the impact that the project has had on the *enrol-if-promoted.* This is done by dividing the effect computed in the first step by the percentage of *enrol-if-promoted* in the group of the promoted households. Although this subgroup cannot be identified directly, their percentage can be determined: it is the difference in the enrolment rates of the promoted and non-promoted groups.

For this method to yield valid estimates, the promoted and non-promoted groups must be comparable. This is achieved by randomly assigning households into the promoted and non-promoted groups. The randomized assignment will ensure that observable and unobservable characteristics are balanced between the promoted households—the treatment group—and the non-promoted households—the comparison group. As a result, unbiased estimates of the effect of treatment on any outcome can be obtained by implementing the described two-step procedure. Econometrically, this is realized by applying an *instrumental variable* approach. The precise estimation model will be determined after completion of data collection.

Assessing the Impact of IMCHN Interventions

The estimations of the impact of IMCHN interventions at the community health worker (CHW) level and the household level will follow the same approach. Under a plausibility design, the impact is estimated comparing the outcomes at baseline—before the intervention—with the outcomes at follow-up.

The CHW baseline survey will be implemented before IMCHN will train the CHWs from FAS communities. The CHW follow-up survey will be implemented after the CHWs completed the IMCHN trainings on maternal and child health and nutrition. IMCHN implementers have agreed to time these trainings for the CHWs of FAS communities in a way that the household visits of the newly trained CHWs fall into the period after the FAS farm household baseline survey is completed and that there is sufficient time for the CHWs to visit a large number of the surveyed farm households before the follow-up survey. According to the prime implementer of IMCHN, this proposed coordination between farm household survey implementation timeline and IMCHN health and nutrition training implementation in FAS communities will be in line with the planned implementation of IMCHN.

The effects of IMCHN at the CHW and household levels will be estimated by *ordinary least squares (OLS)* regressions with *fixed effects* at the respective level of observation. The precise estimation models will be determined after completion of data collection.

Exploring Possible Synergies between FAS and IMCHN Interventions

A third set of estimation models will explore whether the household-level effects of IMCHN interventions are larger when households received FAS interventions. The estimation model will resemble to the household-fixed effects model for estimating the impact of IMCHN interventions, while the estimation equation will be augmented by an interaction term that identifies FAS beneficiary households. The precise estimation model will be determined after completion of data collection.

G. Ethical Conduct

IFPRI follows strict ethical standards and best research practices. Prior to data collection, approval of the study design will be sought from IFPRI's Institutional Review Board and from all necessary (local) authorities in Egypt, as well as from USAID/Egypt. The experimental evaluation design will be registered at the US National Institutes of Health service (clinicaltrials.gov) or a similar public trial repository. In line with IFPRI requirements, all IFPRI staff involved in the study must have completed the basic "Social and Behavioral Research" training of the Collaborative Institutional Training Initiative (CITI) recently. Before the start of each interview, written, informed consent for participation in the study will be obtained from all interviewees. The survey firm to be contracted for conducting the baseline survey will be responsible for compliance with local ethical standards.

VI. DELIVERABLES AND REPORTING REQUIREMENTS

IFPRI provided and will provide the following deliverables and reporting requirements, specified in the USAID SOW template [with USAID requirement status given in parenthesis]. IFPRI will also provide additional deliverables and reporting requirements, included in the list below. Throughout all its activities, IFPRI is committed to close coordination, consultation, and collaboration with USAID/Egypt and the FAS and IMCHN implementing partners.

Evaluation Work Plan [SUGGESTED]

This revised SOW document presents the most up-to-date version of the FAS-IMCHN impact evaluation study work plan. Because of the nature of design of rigorous impact evaluation studies, the evaluation work plan is subject to the work plans of the implementers of the projects to be evaluated. There have been several modifications to the work plans and planed project activities and delays in activity implementation on the implementer side that required adjustments of IFPRI's FAS-IMCHN impact evaluation study design and work plan.

As per the grant agreement, IFPRI prepares annual work plans of the entire EIBC project, including the work plans for the FAS-IMCHN impact evaluation study component. The work plan of EIBC project year 1 was first submitted on October 13, 2015; a revised version was submitted on November 24, 2015; and a second revised version on December 11, 2015, which was accepted by USAID/Egypt. As per the grant agreement, IFPRI also submits quarterly EIBC project reports, which report on the progress of the FAS-IMCHN impact evaluation study, among others. In addition, the Performance Monitoring Plan (PMP) of the EIBC project included a brief description of the planed FAS-IMCHN impact evaluation study design and tentative work plan. The PMP document was submitted on July 7, 2016, and the revised version on September 8, 2016. The EIBC annual report 2016 was submitted on December 4, 2016, and is currently under review by USAID/Egypt.

Evaluation Design [REQUIRED]

This revised SOW document presents the planned evaluation design of the FAS-IMCHN impact evaluation study in detail. USAID offices are kindly asked to review and consolidate final comments on this revised version through the USAID Agreement Officer's Representative (AOR). IFPRI hopes to receive approval of this SOW soon in order to be entitled to request approvals for implementation of the various data collection activities from the respective national and local authorities.

In-briefing [OPTIONAL]

Shortly after signing the EIBC project grant agreement, USAID/Egypt and IFPRI met for an in-briefing. USAID/Egypt and IFPRI, as well as the FAS and IMCHN implementers and IFPRI, meet regularly and as needed. IFPRI has participated in all half-yearly synergy meetings for the implementers of ARDII projects. The first synergy meeting was held in Luxor on September 30, 2015; the second one—hosted by IFPRI—was held in Cairo on March 8, 2016; and the third one was held in Luxor on January 18-19, 2017. IFPRI has informed USAID/Egypt

about all meetings with the FAS and IMCHN implementers, and IFPRI informs USAID/Egypt about progress on all EIBC project activities on a weekly basis, as requested.

Mid-term Briefing and Interim Meetings [OPTIONAL]

The frequent meetings and close coordination between USAID/Egypt and IFPRI as well as the FAS and IMCHN implementers and IFPRI will continue throughout the EIBC project life time. Numerous meetings with the FAS and IMCHN implementers in the coming months will be conducted in order to coordinate the implementation of the impact evaluation study and, for IFPRI, to stay up-to-date for any (expected) modifications and delays in project implementation. Further down the road, IFPRI will present findings from the baseline and follow-up surveys in respective meetings with USAID/Egypt and the FAS and IMCHN implementers in due time.

Final Exit Briefing [OPTIONAL]

IFPRI will request a final exit briefing with USAID/Egypt before termination of the EIBC project grant agreement.

Final Presentation [OPTIONAL]

IFPRI will present the final findings of the FAS-IMCHN impact evaluation study and their implications for policy and program design and implementation to USAID, the FAS and IMCHN implementers, and the interested public in a completion workshop in Cairo. Upon request, IFPRI will be also very happy to present findings and recommendations at the USAID headquarters in Washington, DC.

Baseline Report [ADDITIONAL]

IFPRI will submit a draft baseline report to USAID/Egypt within six months after completion of the baseline survey data collection. USAID offices will be asked to take up to one month to review and consolidate comments and provide feedback through the AOR. IFPRI will aim for resubmitting the revised version within a period of two months.

Draft Final Evaluation Report [REQUIRED]

The draft evaluation report is expected to follow the report structure outlined in Section IX. The report will seek to answer all evaluation questions identified in this SOW document (Section IV). IFPRI expects the first draft evaluation report to be submitted to USAID/Egypt within nine months after completion of the (first) follow-up survey data collection. IFPRI will suggest to USAID to take up to two months to review and comment on the first draft and provide feedback through the AOR. IFPRI will then submit a revised final draft report within three months and suggest the AOR to review and send final comments within one month of its submission.

Final Evaluation Report [REQUIRED]

IFPRI will take no more than one month to respond/incorporate the final comments from USAID/Egypt. IFPRI will then submit the final report to the AOR. All project data and records will be submitted in full and in electronic form in easily readable format and organized and documented for use by those not fully familiar with the project or evaluation.

Follow-up Report [ADDITIONAL] IFPRI will submit a report presenting findings on changes in outcome indicators between the first and second follow-up survey to USAID/Egypt within six months after completion of the follow-up survey II data collection. USAID offices will be asked to take up to one month to review and consolidate comments and provide feedback through the AOR. IFPRI will aim for resubmitting the revised version within a period of two months.

Journal Articles and Other Scientific Publications [ADDITIONAL]

IFPRI will develop at least two papers for publication in scientific journals or other scientific publication outlets from analyses of the data collected for the FAS-IMCHN impact evaluation study. The journal articles (or other peer-reviewed outlets) may be published after EIBC completion because of often long review and printing timeframes of publishers.

VII. EVALUATION SCHEDULE

The evaluation schedule of the FAS-IMCHN impact evaluation study depends on the implementation timelines of FAS and IMCHN. This section presents the planned evaluation schedule for the impact evaluation study over the (remaining) EIBC period on a bimonthly basis (Table 4) and its milestones.

The evaluation schedule is designed to capture the impact of FAS with focus on the agricultural winter season—the main season for horticulture production in Upper Egypt. Thus, the farm household baseline survey needs to be completed before the FAS agribusiness interventions for the 2017/2018 winter season start. To implement a credible baseline survey, a farm household listing exercise and the sample selection for the baseline survey need to be completed beforehand. The household listing exercise is scheduled to start in April 2017 and is expected to continue throughout the following three months, depending on FAS' progress in selecting farmer associations/cooperatives for intervention during the winter season 2017-2018. The baseline survey data collection will be conducted in August-September 2017, with preparation work—including enumerator and interviewer training and pilot and field testing of the questionnaires—starting right after the month of Ramadan. The (first) follow-up survey will be conducted after the winter season 2017-2018, when FAS agribusiness interventions for that season have been completed, and the immediate impact of these interventions has likely emerged. The implementation of this follow-up survey is planned for March-April 2018, with preparation work starting one month earlier. The implementation of the second farm household follow-up survey is planned for one year after the implementation of the first follow-up survey—in March-April 2019. Preparation work is scheduled to start one month earlier.

For practical and methodological reasons, the CHW baseline and follow-up surveys are planned to be conducted in parallel or shortly before the implementation of the farm household surveys. Yet, the timing of the CHW surveys can be adjusted to the implementation timeline of IMCHN to some extent.

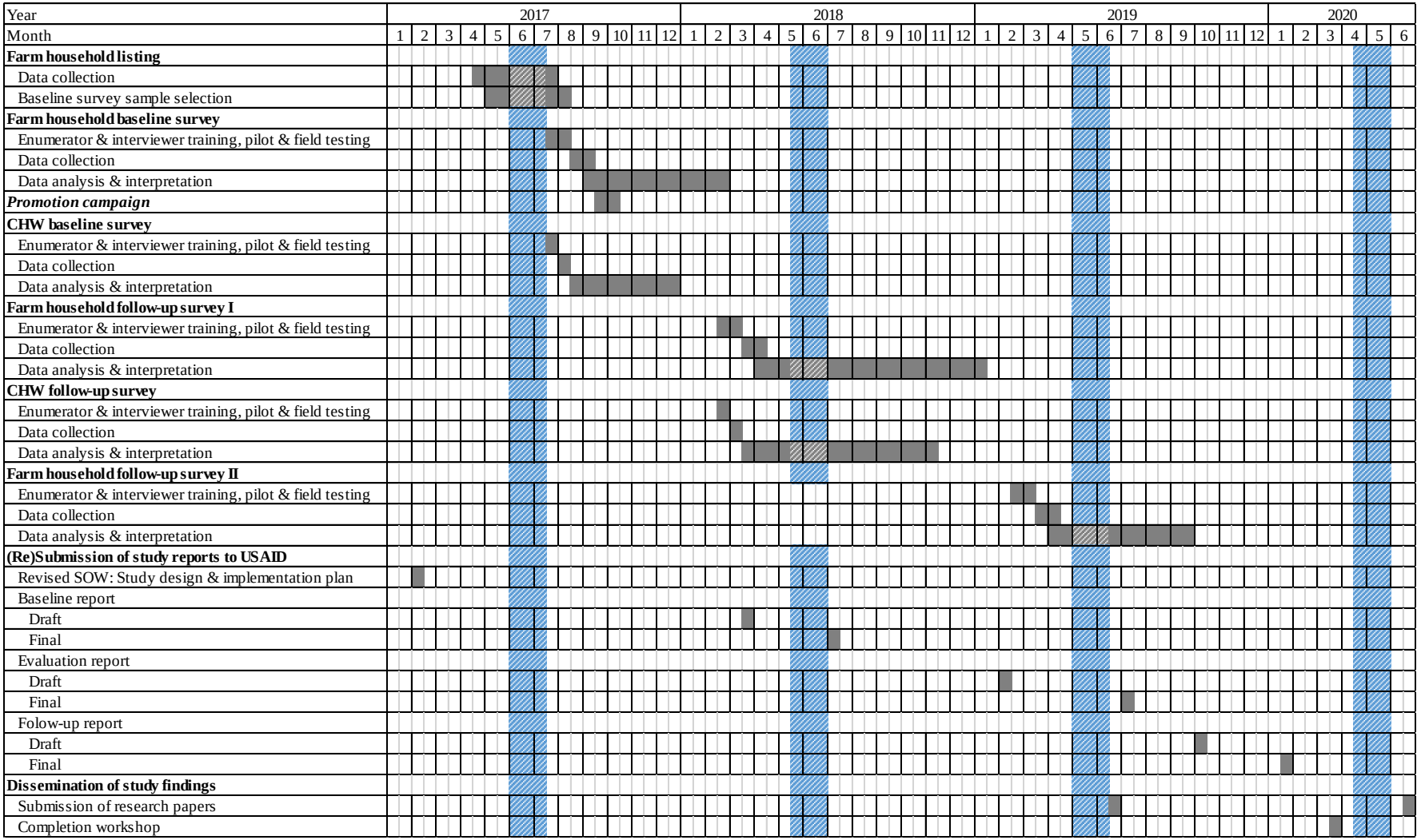
For all surveys, data analysis will start during data collection with checking the validity of the collected data. In this way, in cases of dubious information, follow-up visits with households/CHWs can be carried out by the enumerator team during the field work period. Using Computer-assisted Personal Interviewing (CAPI) technique will allow IFPRI and the survey firm to perform data validity checks on the interview day. Once the survey interviews are completed, IFPRI will clean the data and prepare the datasets for further analysis. The final steps are to estimate the project impacts and/or changes in outcome indicators over time, to analytically explore the impact pathways, to summarize the results in reports (and papers), and to disseminate the study findings.

In summary, the milestones of the planned evaluation schedule of the FAS-IMCHN impact evaluation study are:

1) Approval of this SOW by USAID by mid- February 2017,
2) Implementation of the farm household listing in March-April 2017,

3) Implementation of the farm household and CHW baseline surveys in August-September 2017,
4) Submission of the draft baseline report in April 2018 and the final version in July 2018
5) Implementation of the farm household and CHW follow-up surveys in March-April 2018,
6) Submission of the draft evaluation report in February 2019 and the final version in August 2019,
7) Implementation of the second farm household follow-up survey in March-April 2019,
8) Submission of the draft follow-up report in October 2019 and the final version in January 2020, and
9) Completion workshop in March 2020.

Table 4: Planned implementation timeline



Note: The blue-shaded time periods mark the month of Ramadan.

Source: Own representation.

VIII. FINAL REPORT FORMAT

IFPRI will submit a final evaluation report of the FAS-IMCHN impact evaluation study that will be structured as follows:

14) Executive Summary
15) Introduction
16) Evaluation Purpose and Evaluation Questions
17) Background and Context
18) Evaluation Design, Methods, and Limitations
19) Findings
20) Conclusions and Recommendations
21) Annexes (including Evaluation SOW; Evaluation Methods and Limitations in Detail; Data Collection Instruments; Sources of Information; Conflict of Interest Disclosure)

IFPRI will make the final evaluation reports publicly available through USAID's Development Experience Clearinghouse within one month after final approval of the formatted report.

IX. CRITERIA TO ENSURE THE QUALITY OF THE EVALUATION REPORT

IFPRI will ensure highest quality of the draft and final reports of the FAS-IMCHN impact evaluation study by:

- Strictly following the USAID evaluation report guidelines and review checklists;
- Precisely addressing the primary and secondary evaluation questions (presented in Section IV);
- Collecting survey data using Computer-assisted Personal Interviewing (CAPI) technique;
- Ensuring highest possible quality in data collection and processing;
- Applying rigorous and state-of-the art evaluation methods;
- Utilizing evidence from the relevant literature to complement and contextualize the study findings and conclusions; and
- Complying with IFPRI's highest research and publication standards.

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APPENDIX II: IMPLEMENTATION PLAN

IMPLEMENTATION PLAN

Impact Evaluation

Of the

Feed the Future Egypt, Food-Security and Agribusiness Support Project (FAS)

And the

Improving Maternal, Child Health and Nutrition Services Project (IMCHN)

Activity Name: Evaluating Impact and Building Capacity (EIBC)

Grant No.: AID-263-IO-15-00001

Submitted to: USAID/Egypt

Submitted by: International Food Policy Research Institute (IFPRI)

Submitted on: July 17, 2017

Comments received on: October 29, 2017

Replies sent on: October 30, 2017

Revision submitted on: November 29, 2017

I. OVERVIEW

This document presents the implementation plan of the impact evaluation study of the International Food Policy Research Institute (IFPRI) for the Feed the Future Egypt, Food-Security and Agribusiness Support project (FAS) and the Improving Maternal, Child Health and Nutrition Services project (IMCHN), funded by the United States Agency for International Development in Egypt (USAID/Egypt).

A. Study Objectives

The Statement of Work (SOW) of the FAS-IMCHN impact evaluation defines the *study objectives* as follows (IFPRI 2017, p. 6):

> The *overarching objective* of the FAS-IMCHN impact evaluation study is to learn whether promotion of agribusiness activities, along with nutrition and health promotion activities, improve rural household livelihoods and particularly household food security and individual nutrition, especially of young children and their mothers.
>
> The *specific study objectives* are (1) to estimate the impact of FAS interventions on project outcome indicators—especially on household income (measured by total household expenditure), household food security, and maternal and child nutrition—among farm households; (2) to estimate the effects of IMCHN interventions on maternal and child health and nutrition knowledge among community health workers (CHWs) and among farm households; and (3) to analytically explore potential synergistic effects of FAS and IMCHN interventions on maternal and child nutrition among farm households being exposed to both projects. The study area comprises rural communities in Upper Egypt.

The SOW further specifies (IFPRI 2017, p. 7):

> The first two specific objectives emerge directly from the project goals and objectives of FAS and IMCHN, respectively. The proposed impact evaluation approach will allow for the evaluation of the impact of FAS and the impact of IMCHN separately of each other. Two complementary evaluation designs are proposed: an *experimental* design for the evaluation of FAS, and a *plausibility* design for the evaluation of IMCHN. The planned FAS impact evaluation method will provide estimates of household income, household food security, and child and maternal nutrition indicators among farm households and estimates of changes in these indicators over time that are attributable to the FAS interventions. The planned IMCHN impact evaluation method will provide estimates of indicators of maternal and child health and nutrition knowledge among CHWs and farm households and estimates of changes in these indicators over time that result plausibly from the IMCHN interventions. Data for the FAS evaluation will be collected in farm household baseline and follow-up surveys, based on a household listing exercise in FAS associations/cooperatives. Data collection for the IMCHN evaluation will include CHW

baseline and follow-up surveys. Given that IMCHN enrolls CHWs from all rural health centers in Upper Egypt—including FAS communities, farm households in these communities will be automatically exposed to IMCHN interventions. Therefore, the farm household surveys will be also used to assess the impact of IMCHN at the household level. […]

The third specific study objective follows from the research and learning agenda of the FAS-IMCHN impact evaluation study. The spatial and temporal overlap of FAS and IMCHN; the joint project goal of improving maternal and child nutrition in rural areas; and the possible complementarity of IMCHN activities (at the CHW level) and FAS activities under the "agri-nutrition" component (at the household level) provide an excellent opportunity for research to explore synergistic effects. Resulting findings are expected to provide new evidence on how to leverage agriculture-nutrition linkages among smallholder farm households at large scale. However, because FAS and IMCHN are not designed as combined projects with one overarching goal, utilizing potential synergistic effects cannot be used as a criterion to assess project success.

B. **Modification of Evaluation Design**

The objectives and design of the impact evaluation study will be pursued and implemented as defined in the SOW, with two important exceptions:

First, the proposed design for the FAS impact evaluation was an *experimental* design, which has been IFPRI's preferred evaluation approach because of its proven methodological rigor in attributing observed changes in outcomes to project interventions. IFPRI carefully assessed several possible experimental designs and concluded that the only feasible experimental design was a "randomized promotion" method. This is reflected in the SOW (IFPRI 2017). The SOW specifies several critical conditions that needed to be met for the successful implementation of the proposed evaluation design (IFPRI 2017, p. 10-11):

> The proposed design for the FAS evaluation—using a "randomized promotion" method […]—will work only if (a) the evaluator's extra promotion strategy is effective; (b) the implementer maintains its own, normal promotion strategy; (c) the promotion only affects the decision of farmers to participate […]; (d) the promotion minimizes diffusion into the comparison group; and (e) the sample population of eligible households is clearly defined […].

Since the submission of the SOW to USAID, IFPRI has consulted extensively with the FAS implementer and monitored to what extent the above conditions were being met. As of today, these critical conditions have not been met and appear highly unlikely to be met. In detail:

- *It is not possible to assure that the promotion strategy will be effective*. Providing the "extra layer" of information on which the promotion strategy would rely on is unlikely to allure farmers to participate. According to the FAS implementer, take-up rates during early implementation phases of FAS are very low because of the lack of responsiveness

of farmers to the messages provided by the implementer during the project introductory meetings. Therefore, many farmers hesitate to participate in FAS and prefer to wait and observe how FAS will perform before they commit. Hence, an extra promotion strategy (by IFPRI) would have been unlikely to be sufficiently effective, especially given a limited number of farmers who may qualify for FAS participation, which is outside the control of IFPRI and in the hand of the FAS implementer. The FAS implementer also feels that it is undesirable, if only a subgroup of farmers in the community randomly receive additional information. The FAS implementer believes that this information asymmetry may be a potential source of tensions in the community and may hence further complicate the implementation of FAS. IFPRI respects this notion of the FAS implementer.

- If IFPRI could implement an (effective) extra promotion strategy, *IFPRI cannot guarantee that the FAS implementer will not adjust its normal promotion strategy* to incorporate elements of IFPRI's information campaign in the course of the FAS rollout. The FAS implementer seems to not have a standard promotion strategy but rather decides ad hoc about the intensity of the FAS promotion and the level of information provided. Hence, the FAS implementer appears to customize their promotion strategy to the individual farmer association and agricultural cooperative to reach the desired number of participating farmers.

- *IFPRI cannot guarantee that large diffusion of information from the farmers who would receive the extra information to the farmers who would not receive it will not occur.* Experiences gained during recent field trips indicate that agriculture-related information is shared quickly and extensively between farmers from the same association/cooperative.

- *The sample population—that is, the population of farmers who are interested and qualified to participate in FAS—is not well defined.* Objectively assessing farmers' interest to participate in FAS appears to be challenging, and the FAS qualification criteria often vary between different value chains and different geographical areas and hence different associations/cooperatives.

- *Critical information needed to implement a randomized promotion design (including FAS value chains to be promoted, FAS intervention villages, precise FAS rollout plan, and dates of contract signing) are still unknown or have not been made available to IFPRI until today.* Given that implementing a randomized promotion design requires substantial preparatory work based on fixed project parameters, the time period between providing the critical information and the start of the FAS intervention will be likely to short to implement this evaluation design.

IFPRI has thus concluded that an experimental design is not feasible and that a (methodologically less rigorous) matching approach—a quasi-experimental design—will be used. (The proposed matching methods are discussed in Section IV in detail.)

Second, USAID provided comments and requested revisions to the first submitted version of this implementation plan. In addition, the Egyptian Ministry of Investment and International Cooperation (MIIC) requested revisions to the questionnaires and conditioned its approval of the study implementation on these revisions. In this version of the implementation plan, IFPRI will address all comments and revisions requested by USAID and MIIC. The changes are as follows:

- *Household food security status will not be surveyed, will be dropped as primary outcome indicator of the impact evaluation, and will be replaced by dietary quality (as measured by dietary diversity) in the formulation of the study objectives. The third specific study objective (to analytically explore potential synergistic effects of FAS and IMCHN interventions) will be dropped.* The **revised *study objectives*** are as follows:

  The *overarching objective* of the FAS-IMCHN impact evaluation study is to learn whether promotion of agribusiness activities, along with nutrition and health promotion activities, improve rural household livelihoods, household dietary quality, and nutrition of young children and their mothers.

  The *specific study objectives* are (1) to estimate the impact of FAS interventions on project outcome indicators—especially on household income (measured by total household expenditure), household dietary quality (as measured by dietary diversity), and maternal and child nutrition—among farm households and (2) to estimate the effects of IMCHN interventions on maternal and child health and nutrition knowledge among community health workers (CHWs) and among farm households. The study area comprises rural communities in Upper Egypt.

- *No blood samples for hemoglobin measurement (to detect anemia) will be collected.*

- *Anthropometric measurements will be collected for all children age 0-59 months and their mothers/female caretaker. No anthropometric measurements will be collected for adult males.*

- *Indicators for Women Empowerment in Agriculture (WEIA) will not be surveyed.*

- *Other changes requested by MIIC to (and deletions of) specific questions in the questionnaires (e.g., on household member relationships, electricity supply, bread subsidy quotas, perceptions of body weight and shape, CHWs' daily activities) have been made.*

- *No GPS coordinates (for the location of visited households and community health centers) will be collected.*

- *Aswan governorate will be excluded from data collection. All other communities where FAS has new farmers enrolled for the winter season of 2017/18 can be surveyed.*

The remainder of this version of the implementation plan document was revised to accommodate these changes.

C. **Outline**

The remainder of this document proceeds as follows: Section 2 describes the FAS and IMCHN interventions to be evaluated in detail. Section 3 explains the data collection and survey sampling procedures. Section 4 elucidates the empirical approach and methodology of the impact evaluation study. Section 5 discusses the critical assumption for implementing the impact evaluation study and the baseline surveys in particular. Appendices I – IV present the baseline survey questionnaires.

II. **PROJECT INTERVENTIONS**

FAS and IMCHN are inherently two different projects and were not designed to contribute to one, overarching goal. Therefore, the impacts of the two projects will be evaluated separately of each other. Nevertheless, the spatial and temporal overlap of FAS and IMCHN interventions will be utilized in data collection.

A. **FAS Interventions**

FAS is USAID/Egypt's core agriculture activity and is aligned with USAID's global Feed the Future initiative (FtF). The project period is five years—from July 2015 to June 2020. The FAS description report (USAID and VEGA 2015) and FAS year 2 work plan report (VEGA 2016) define the project goals, components, and targets as follows:

The *goal* of FAS is to:

- Increase the incomes of 14,000 Upper Egypt smallholder farmers,
- Enhance food security of farm households, and
- Improve the nutritional status of women and young children.

To achieve this goal over the project period, FAS has four project components:

22) Improved on-farm production;
23) More efficient post-harvest processes;
24) Improved marketing of agriculture crops and products; and
25) Improved nutritional status, especially for women and children.

The project targets include (among others):

- A 12% annualized increase in household incomes in net present value (≈ US$ 380 per household per year) for over 14,000 horticulture-based smallholder farmers;
- Up to 50% of increased yields of selected horticulture crops;

- The introduction of 350 new contracts between horticultural smallholder farmers and market channels; and
- Upwards of 36,000 farm families benefiting from nutrition-sensitive messaging.

Increasing household incomes of smallholder farmers is FAS's primary project objective, while other goals and targets are intermediary or subordinate to that.

FAS's intervention areas comprise (rural) villages in seven Upper Egypt governorates (Aswan, Assiut, Beni Suef, Luxor, Menia, Qena, and Sohag). To reach the beneficiary farm households, FAS works through formalized *farmer associations* and *agricultural cooperatives*. Farmer associations are registered with the Ministry of Social Solidarity (MOSS), and agricultural cooperatives are registered with the Ministry of Agriculture and Land Reclamation (MOALR). Farmers' membership in an association is voluntary and based on the specific purpose of this association (e.g., for promotion of horticultural production). A cooperative has a general agricultural development purpose, and all farmers within the cooperative's catchment area are formal members of that cooperative. The beneficiary farmers of FAS (will) include exclusively smallholder farmers, defined as having a *farm size of 10 feddans* (= 0.42 hectare = 1.038 acre) *or less* per household (CNFA 2016).

FAS applies a value chain development approach. The promoted value chain crops are selected from a list of ten focus horticultural crops, a list of five potential horticulture crops with high-demand potential in export and domestic markets, and a list of eight complementary, or secondary, horticultural crops, which are cultivated as part of the crop rotating system (CNFA 2016). The ten focus horticulture crops are tomatoes, onions, sweet potatoes, peppers, green beans, table grapes, mangoes, coriander, cumin, and anise; the five potential horticulture crops are baby garlic, peppermint, savory, and stevia; and the eight complementary horticulture crops are okra, garlic, palm date, fennel, black-seed, basil, henna, and parsley (CNFA 2016). FAS predominantly focuses on the development of vegetable and herb/spice value chains—rather than fruit value chains—because of higher marketing potentials in export and domestic markets and their one-season lifetime (needed to introduce improved varieties and harvest their products within a season). The selection of the promoted crops depends on the actual marketing potential in each season.

Many of the vegetables and herbs/spices are grown typically during a particular agricultural season and mostly in only some governorates and some areas within a governorate, because of different heat tolerance and soil quality. The (perennial) fruits are harvested only once per year. This provides a natural selection of the value chains for FAS interventions by season and governorate. Because of the selected horticultural crops and their production requirements, the main season for FAS interventions is the *winter season*. The profit margins in export markets—especially in Europe—tend to be much larger also during the winter, when domestic production in the main export countries (in Europe) is very limited. FAS matches the selected horticultural crops with selected associations/cooperatives, based on the associations/cooperatives' production capacities and qualifications, the identification of buyers for the horticultural crops to be promoted, the local marketing potential of the products (e.g., proximity to

buyers/processors, clusters of producers), and the farmers' preferences—in addition to the local production conditions.

To realize the project targets, FAS implements a comprehensive set of interventions, including—for farmers—on-farm trainings, classroom trainings, support for use of modern inputs, trade show attendance, and buyer visits. Due to farmers' higher needs for support in production and marketing, FAS interventions for developing vegetable and herb/spice value chains are more intensive than the interventions for developing fruit value chains. Naturally, all interventions are crop- and value chain-specific. The single, most tangible intervention that is consistent across all vegetable and herb/spice value chains at the farm level and that determines receiving other value chain-specific interventions is a *forward contract*. Forward contracts will not be implemented for all promoted fruit crops across all associations/cooperatives, but will be aimed for. Forward contracts are signed on a seasonal basis—usually (shortly) before the start of planting of the respective season (but sometimes even shortly thereafter)—and refer only to the harvest at the end of that season.

FAS's main role is to bring together buyers and producers of the promoted horticulture crops, to facilitate contract signing, and to motivate, assist, and train farmers to fully understand and comply with the signed contract. A contract will be signed between a buyer and an association/cooperative on behalf of the group of participating farmers or between a buyer and an individual farmer. In the former—more common—case, each participating farmer will commit to the group contract (usually without formal agreement). The associations/ cooperatives will present the FAS implementer a list of the participating farmers after contract signing, and the FAS implementer then will start working with these farmers. Hence, *only the signed contract allows to unambiguously identify the associations/cooperatives* that will be enrolled in FAS, as well as the FAS beneficiary farmers. No definite identification of FAS intervention associations/cooperatives or FAS beneficiary farmers is possible before the contract is signed, because associations/cooperatives, individual farmers, and buyers can decide to refrain from participating in FAS or committing to a draft contract (without penalty) at any time. In practice, withdrawal of associations/cooperatives or individual farmers' commitment from a draft contract or even a contract already signed by the potential buyer is common, as contract modalities tend to be modified throughout the process of contract specification and the contract details may not be fully known or understood by all farmers until the final contract is signed. At least for the promoted vegetable and herb/spice value chains, FAS interventions are conditional on a forward contract. Farmers who commit to an association/cooperative-signed contract or who sign an individual contract will receive the full package of FAS interventions. The contract guarantees farmers to sell an agreed minimum quantity of the promoted horticultural product with a minimum quality grade to a trader or processor at a predefined price. A forward contract can also be expected to be the single intervention with the highest potential for farm household income increases. Taken all together, having a forward contract (or not) is the natural choice for the treatment variable of the FAS impact evaluation (whereas other suitable identifies of FAS participation before the start of the interventions that are consistent across value chains are unavailable).

For each season, the FAS implementer plans to expand the project's beneficiary population through establishing contracts in "new" FAS associations/cooperatives—that are associations/cooperatives which have not signed a contract in previous seasons—and by enrolling "new" FAS farmers—that are farmers who have not committed to a contract in previous seasons—from "old" FAS associations/cooperatives. The FAS implementer aims at enrolling a total of *2,000 new farmers* from both new and old associations/cooperatives for the upcoming 2017-18 winter season. The FAS implementer plans to work with *55 associations/ cooperatives* in the 2017-18 winter season.

The FAS implementer is finalizing the specific vegetable and herb/spice value chains to be promoted during the 2017-18 winter season and is finalizing the lists of the associations/cooperatives and the individual farmers that will be targeted for these value chains. The FAS implementer has promised to share this information with IFPRI as soon as it becomes available.

B. IMCHN Interventions

IMCHN is an Egypt-wide project under USAID's global Maternal and Child Survival Program (MCSP) and hence shares its ultimate goal. The goal is to end preventable child and maternal deaths within a generation. The project period is three years and includes two phases, while only the second phase is of relevance for the impact evaluation study (IFPRI 2016). The project objective of the second phase is to develop a national training system for the Raedat Refiat program of the Egypt Ministry of Health and Population (MOHP) and implement it at scale, including in all seven Upper Egypt governorates that are also targeted by FAS (Jhpiego et al. 2017).

The new Raedat Refiat training curriculum includes a comprehensive list of nutrition and health topics, especially related to maternal and child health. The training modules that are relevant in the context of this impact evaluation study are *nutrition* and *reproductive health*. The draft training documents of these two modules were made available to IFPRI.

To train all Raedat Refiat (approximately 11,000 individuals nationwide), a four-stage training approach is applied: First, MCSP, together with MOHP, selects 60 MOHP staff for training as Master Trainers and trains them starting in April 2017. Second, MCSP and MOHP select Lead Trainers from each governorate, and MCSP and the Master Trainers conduct trainings in the governorates to develop the Lead Trainers. Third, the Lead Trainers train the supervisors and managers of the Raedat Refiat (approximately 1,300 individuals countrywide), starting in July 2017. Fourth, the Raedat Refiat supervisors and managers—with coaching and support from the Lead Trainers—train the Raedat Refiat, starting in October 2017 (Jhpiego et al. 2017). The training will be conducted over a 12-months period, with one day of training per month, held at the Raedat Refiat's primary care health unit. Thus, the start of the Raedat Refiat training period coincides with the beginning of the 2017-18 agricultural winter season. MCSP has agreed to prioritize community health centers from villages that are part of the impact evaluation and the training modules that are relevant for the impact evaluation. IFPRI will inform MCSP about the FAS intervention villages as soon as they are available to IFPRI.

Each Raeda Refia is responsible for about *500 families* and is expected to conduct *160 home visits per month* (or eight home visits per day), so that each of the 500 families for whom she is responsible is visited once per quarter (Jhpiego et al. 2017). Accordingly, each Raeda Refia should be able to communicate the newly acquired knowledge of at least the first three training days to all families under her responsibility during the 2017-18 winter season (lasting about six months).

III. DATA COLLECTION AND SURVEY SAMPLING PROCEDURES

Data collection for both the FAS evaluation and the IMCHN evaluation will be conducted in FAS intervention villages located in Upper Egypt (except in Aswan governorate), using questionnaire-based personal interviews. Household-level data will be collected for the FAS and IMCHN evaluations during the same farm household surveys. For the IMCHN evaluation, additional CHW surveys will be conducted. The farm household surveys and CHW surveys will be implemented at the same time.

Three rounds of data will be collected. The baseline surveys will be implemented in December 2017 and January 2018, before the start of the FAS and IMCH interventions in the sample villages. The first follow-up surveys will be implemented in April 2018, after the completion of the FAS interventions (during the 2017-18 winter season) and the completion of the IMCHN intervention. The second follow-up surveys will be implemented in April 2019. The first follow-up surveys are expected to capture the 'immediate' project effects, and the second follow-up surveys are expected to capture the 'sustained' project effects. The baseline and follow-up surveys will be conducted with the same farm households and the same CHWs by re-interviewing the farm households and CHWs during the follow-up surveys who were interviewed during the baseline surveys. This approach will produce a panel of farm households and a panel of CHWs and will allow to track the living and farming conditions of households and the nutritional and health statuses of their members and the knowledge of CHWs over time.

A. Farm Household Survey Sampling

The project parameters of FAS have the following implications for the design of the FAS impact evaluation study and the implementation of the farm household baseline survey:

1) The impact evaluation will focus on assessing the project effects for vegetable and herb/spice interventions.

2) The observation periods of the impact evaluations are the 2017-18 winter season and the 2018-19 winter season.

3) The associations/cooperatives that FAS will work with in the 2017-18 and 2018-19 winter seasons, and hence the FAS intervention villages are uncertain (or even unknown) until an association/cooperatives or individual farmers from an association/cooperative sign a forward contract.

4) The baseline survey will be conducted with households of new FAS farmers from both old and new associations and cooperatives.[35]

[35] Old FAS farmers will be excluded, because the baseline survey must be implemented before the start of the interventions to avoid bias in the estimated project impact.

5) A farm household will be considered part of the "treatment group" of the impact evaluation if the farmer signed an individual FAS-facilitated forward contract with a buyer or committed to FAS-facilitated forward contract between the representing association/cooperative and a buyer (between July and November 2017). A farm household is eligible for the "comparison group" if the farmer did not sign or commit to such a contract (see below for details on the construction of the comparison group).

6) Because the contracts for the 2017-18 winter season will not be signed at the same date across all associations/cooperatives but over a period of several months, the baseline surveys will be implemented over this time period. In each village of such a new FAS association/cooperative, the baseline surveys will be conducted after the contract was signed and before the start of the FAS intervention in that village.

Complete lists of (farm) households and their addresses from public sources (e.g., population census data) are unavailable. Moreover, it has been impossible to conduct a full household listing exercise in the FAS intervention villages (sufficiently) in advance of the start of the FAS interventions, because the intervention villages are unknown until the contracts are signed (and because IFPRI has not been granted permission by MIIC to collect data).[36] Therefore, the sample of farm households to be included in the evaluation study (and hence visited at baseline for interview) cannot be randomly drawn from a census list before the start of the baseline survey, as is common practice in other impact evaluation studies. However, some sort of random selection of at least the comparison households is needed for a valid impact evaluation study.[37]

IFPRI will compile the lists of households to be interviewed in a village "on the fly", that is, during the implementation of the baseline survey. The following procedure will be used: Immediately after a contract is signed, FAS informs IFPRI about the signing association/cooperative (or individual farmers) and provides a list of farmers who committed to this contract and their contact details. These farm households will constitute the treatment group. The farm households for the comparison group will be randomly selected from the household population within the FAS intervention villages (that is, the village where the FAS association/cooperative is based), using a *random walk* method.

The random walk method includes two basic steps for sampling households from a household cluster (village):

1) Identification of a starting point: address of a FAS farmer

2) Random selection of a household based on a predefined walking route: See implementation protocol for household listing in Appendix V.

To identify comparison households that are most comparable with FAS farm households, a short set of questions will be asked to assess their "eligibility" for participation in the study.

[36] Note that IFPRI applied for approval in March 2017.

[37] Sample design limitations and the approaches to overcome them are presented in the following subsections.

These questions are consistent with the minimum FAS selection criteria and define the inclusion of a household into the comparison group. They can be summarized in three key questions:

1) "Is your household engaged in farming?" – YES.
2) "How many feddans of agricultural land does your household farm?" – 10 OR LESS.
3) "Has your household ever cultivated vegetables or herbs/spices or is your household interested in cultivating vegetables or herbs/spices in the future?" – YES.

The identification of the comparison households through the random walk will be conducted by a specialized team that starts work before enumerators conduct the household interviews. As explained below, within each FAS intervention village, 1.2 comparison farm households will be interviewed for every FAS farm household. After the identification of all sample households in a village is completed, FAS farm households and non-FAS farm households will be interviewed for the baseline survey in their homes. All (available) FAS farm households in an intervention village will be interviewed. Data collection will be continued until the calculated sample size is reached or all (available) FAS farmers of the 2017-18 winter season have been interviewed (until baseline survey completion; see timeline in Subsection D).

B. **Household Survey Sample Size**

Sample size requirements of the farm household baseline surveys are calculated for the primary outcome of the FAS evaluation. The primary outcome of this impact evaluation study is total household expenditure per capita (as proxy for household income) (IFPRI 2017). Sample size calculations will be based on the estimated (immediate) impact of FAS over the 2017-18 winter season, using the differences expected to be found between farm households who signed or committed to a FAS-facilitated forward contract and those who did not sign/commit.

Because IFPRI does not have precise information on the number of associations/cooperatives that the FAS implementer will work with during the 2017-18 winter season and the number of farmers that will be newly enrolled to the 2017-18 winter season in each of the associations/cooperatives, the minimum sample size required for the impact evaluation was calculated assuming that FAS will work with 55 associations/cooperatives and with 36 new beneficiary farm households in each of these associations/cooperatives in that season.[38] Given the uncertain numbers of participating associations/cooperatives and participating farmers in these associations/cooperatives, the sample size is calculated for *two scenarios*: The first scenario assumes that five associations/cooperatives and six farm households per association/cooperative refuse to participate in the study, cannot be reached, or drop out from

[38] As noted above, the FAS implementer plans to work with 55 associations/cooperatives during the 2017-18 winter season and aims at enrolling a total of 2,000 new farmers to the 2017-18 winter season. This is equivalent to, on average, 36 new farmers per each of these associations/cooperatives. (The FAS implementer provided IFPRI a list of 55 potential associations/cooperatives for the 2017-18 season, which, however, is likely to change.)

the project after the baseline survey. This leaves *50 associations/cooperatives with 30 farm households each*. The second scenario marks a situation where the FAS implementer faces enrollment difficulties. This "low-participation" scenario assumes *40 participating associations/cooperatives with 20 participating farm households each.* Further, the sample size calculation under both scenarios was based on the following parameters: 0.05 probability of a type I error and a statistical power of 0.80. The sample size—estimated for a randomized controlled trial (RCT) design—was adjusted for intra-cluster correlation.

Before presenting the estimates, an important caveat needs to be pointed out: The method for calculating sample size used here is developed for an RCT design. Equivalent methods for calculating sample size for a matching analysis do not exist. The results presented below are therefore based on the assumption that the two study arms (of an RCT) have at least 50 (or 40) clusters (associations/cooperatives) each—or a total of 100 (or 80) clusters in the full sample. However, in the sample for the matching analysis of this study, all households (of both treatment and comparison groups) come from the same 50 (or 40) clusters (that are, villages with FAS associations/cooperatives) in the full sample. The likely, positive intra-cluster correlation (ICC) on the outcome variables implies a degree of similarity among the households from the same cluster that reduces the statistical power of an estimation based on the sample. This reduction in statistical power may be substantial. The ICC is taken into account in the sample size calculations provided below. At the same time, however, the matching will not be limited to households (or individuals) from the same cluster but will utilize data from all sample households (or individuals). The matching algorithm operates by estimating the average difference in the outcome of each treatment observation and a weighted average of outcomes from the comparison observations, where the weights for each treatment observation are based on the degree of similarity in observable characteristics between that treatment observation and the comparison observations. The matching algorithm places higher weights on comparison observations that are most similar to the treatment observation and a low weight on the least similar observations. This process of estimating mean-weighted differences in outcomes through matching leads to higher statistical power than in a similar RCT design, despite the degree of similarity in observations from the same cluster as captured in the ICC. Hence, the sample size estimates presented below are likely somewhat conservative, meaning that the presented sample size estimates may allow for detecting smaller changes in the outcome variable than the ones assumed for the calculation.

Assuming that an equal number of households in the comparison group is needed to detect the project impact and assuming that 20% of the households in the comparison group will enroll in FAS after the first follow-up survey and before the second follow-up survey, the households for the comparison group will be oversampled in the baseline survey. For each FAS household, 1.2 non-FAS households from the same village will be surveyed.[39] Under the first scenario, the total sample of the farm household baseline survey comprises *1,500 FAS farm households in the treatment group* and *1,800 non-FAS farm households in the comparison group* (or a total of 3,300 farm households). A baseline survey sample size as calculated under the first

[39] See Appendix V for the implementation protocol of the comparison group sample selection.

scenario—or as close as possible to it—is targeted, because this sample size will provide the necessary statistical power for the analysis (that is, allowing to detect relatively small project effects).[40] Note that the 1 to 1.2 ratio of treatment to comparison households is not taken into account in the sample size calculation (instead, an equal number of treatment and comparison households is assumed).

The sample size calculation produced the following results for the primary outcome variable—*household expenditure:*

Using data of the 2010-11 Egypt Household Income, Expenditure, and Consumption Survey (HIECS), the following parameters are assumed: Mean of total household expenditure of farm households in rural areas of the seven Upper Egypt governorates is USD 2870.15 per year (in constant 2011 terms), the standard deviation (SD) is 955.34, and the ICC is 0.12822. Under the first scenario (that is, 50 associations/cooperatives with 30 farm households each), the analysis can detect an effect of household expenditure change amounting to about USD 214 per year or 7.5%. Under the second scenario (that is, 40 associations/cooperatives with 20 farm households each), the study is powered to detect a household expenditure effect of about USD 251 per year or a 8.7% change.[41]

C. **CHW Survey Sampling**

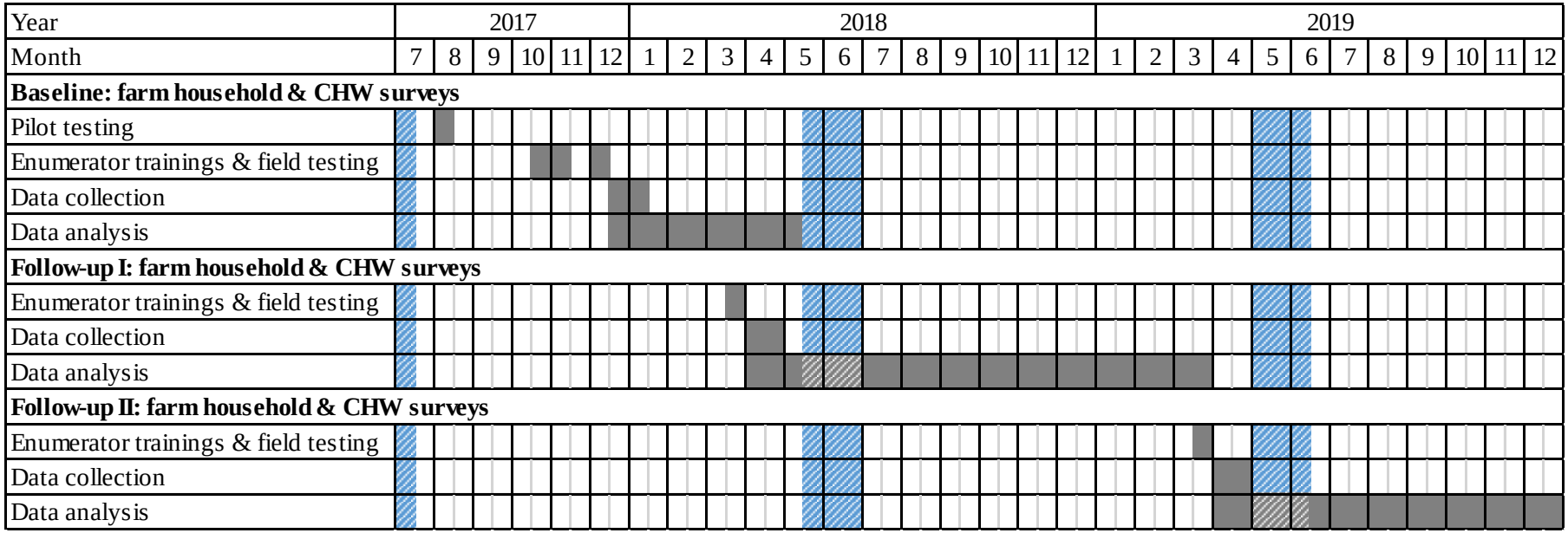
The CHW baseline survey will be conducted with all (available) CHWs from the villages that will be surveyed for the farm household baseline survey and who will be trained under IMCHN. These CHWs include the Raedat Refiat and their supervisors and managers. Assuming that an average FAS intervention villages consist of 1,500 households, the villages' primary health care unit should have three Raedat Refiat. It is also assumed that all primary health care unit with a Raedat Refiat team has one Raedat Refiat supervisor or manager. Thus, the target sample size of the CHW baseline survey is 220 CHWs, assuming that FAS will be implemented in 55 villages in the 2017-18 winter season and all CHWs participate in the survey. The interviews will be conducted in the primary health care unit facilities.

[40] Under the second scenario, the total sample comprises 800 FAS farm households and 960 non-FAS farm households (adding up to a total of 1,760 farm households). The sample size calculated under the second scenario is provided for completeness. IFPRI's objective is to collect data on the sample as calculated under first scenario.
[41] Note that the estimated detectable effect under both scenarios is substantially lower than FAS's target of a 12% annualized increase in total household expenditure. Detecting an impact of 12% requires a smaller sample size but is risky as it would not allow to detect effects that are smaller than 12%. If for instance, FAS has an impact of 10% (which is substantial from a policy perspective), IFPRI would not be able to detect it, if the analysis is powered for a 12% impact.

D. **Implementation Timeline**

Figure 1 presents the implementation timeline for all three survey rounds of the FAS-IMCHN impact evaluation study. The baseline surveys will be conducted over a four-weeks period in December 2017 and January 2018—before the start of the FAS and IMCHN interventions in the study villages. The start of baseline survey depends on receiving the final list of FAS associations/cooperatives and participating farmers and receiving the final approval for study implementation from MIIC. The first and second follow-up surveys will be conducted after the harvests of the 2017-18 and 2018-19 winter seasons, respectively, and before the start of the month of Ramadan, when people's activity and consumption patterns are substantially different than in any other month. Because Ramadan starts at the beginning of May in 2019 and because the first and second follow-up surveys need to be conducted during the same time of the agricultural production cycle, both the first and the second follow-up surveys need to be completed by the end of April in 2018 and 2019, respectively.

Figure 1: Implementation timeline for FAS-IMCHN impact evaluation surveys



Source: Own representation.
Note: The blue/gray-striped cells indicate the months of Ramadan.

Preparatory work for and implementation of the baseline surveys will include the following steps:

1) IFPRI planned to have both the farm household questionnaire and the CHW questionnaire pilot tested in close collaboration with the implementers in the field (that is, with farm households and CHWs in rural Upper Egypt outside the intervention villages) by El-Zanaty & Associates, using paper-based questionnaires. The feedback should have been used to further improve and finalize the questionnaires and to digitalize them for Computer Assisted Personal Interviewing (CAPI). Official approvals were not received (in time) to conducts a thorough pilot testing.

2) Enumerator trainings and enumerator field testing are conducted over a four-week period in October – December. Four groups of enumerators will be trained mostly in parallel: (1) Scouters for household listing (2) interviewers for farm household and CHW surveying, (3) anthropometrists, and (4) field team supervisors. The trainings will be conducted by El-Zanaty & Associates under supervision of and with input from IFPRI. The first half of the trainings were completed by November 15, 2017. The training had to be paused because of IFPRI had not received the final list of FAS associations/cooperatives and participating farmers and the required approval by MIIC in time. IFPRI is expecting to receive the final approval during the first week of December and the training will resume immediately afterwards.

3) Within each survey village, the household listing will be conducted few days (but not more than one week) before the data collection for the farm household survey in that village. The household listing will begin during the first week of December.

4) Pending final approvals, the data collection for the farm household survey will begin in the second week of December and may last until mid-January. The rollout plan of the farm household survey across the different intervention areas will be determined based on the lists of FAS associations/cooperatives and participating farmers. IFPRI hopes that all FAS associations/cooperatives and participating farmers will be known by the beginning of December, so interviews with all survey households can be completed before the start of FAS interventions. Anthropometric measurements will be taken by an anthropometrists team on the day of the farm household interview or the next day.

5) The data collection for the CHW survey will be aligned to the data collection of the farm household survey. Within a survey area (e.g., a district), the data collection for the CHW survey will be conducted in parallel to the farm household survey in that survey area.

The household listing, farm household, anthropometry, and CHW questionnaires for the baseline survey are presented in Appendices I – IV.

E. **Ethical Conduct**

The SOW (IFPRI 2017, p. 38) notes:

> IFPRI follows strict ethical standards and best research practices. Prior to data collection, approval of the study design will be sought from IFPRI's Institutional Review Board and from all necessary (local) authorities in Egypt, as well as from USAID/Egypt. The […] evaluation design will be registered at the

US National Institutes of Health service (clinicaltrials.gov) or a similar public trial repository. In line with IFPRI requirements, all IFPRI staff involved in the study must have completed the basic "Social and Behavioral Research" training of the Collaborative Institutional Training Initiative (CITI) recently. Before the start of each interview, written, informed consent for participation in the study will be obtained from all interviewees. The survey firm […] contracted for conducting the baseline survey will be responsible for compliance with local ethical standards.

F. **Field Work**

After a competitive search and in line with IFPRI's corporate rules, IFPRI selected El-Zanaty and Associates for the data collection of the farm household and CHW baseline surveys (and follow-up surveys, upon IFPRI's satisfaction). The scope of work of El-Zanaty and Associates includes tasks regarding four major activities of the baseline survey data collection process: (1) planning, preparation, and coordination; (2) training of enumerators, anthropometrists, and supervisors; (3) data collection; and (4) data management. The tasks will be detailed in a contract. All tasks will be conducted in close collaboration with and under strict and constant supervision by IFPRI. El-Zanaty and Associates will obtain the required ethical approvals for all staff involved in data collection and processing.

G. **Data Quality**

IFPRI aims at maintaining highest-possible data quality throughout survey implementation, data analysis, and reporting of study results. This involves:

- To precisely follow this implementation plan and especially to precisely address the primary and secondary evaluation questions;
- To officially register the study design of the impact evaluation (see here: https://clinicaltrials.gov/show/NCT03336021);
- To obtain all required approvals before survey implementation;
- To work with an experienced Egyptian survey firm (El-Zanaty and Associates) and to attend all enumerator trainings:
- To request and implement highest measurement standards during enumerator trainings (e.g., standardization of anthropomestrists and equipment, repeated weight and height measurements);
- To collect survey data using Computer-assisted Personal Interviewing (CAPI) technique;
- To carefully oversee all steps during data collection, including running automated and manual data quality checks;
- To apply rigorous and state-of-the art evaluation methods in data analysis;
- To utilize evidence from the relevant literature to complement and contextualize the study findings and conclusions; and
- To comply with IFPRI's highest research and publication standards.

Despite all these steps, the quality of the data may be compromised due to factors that are outside of IFPRI's control. For example, a concern is that FAS (or IMCHN) interventions may start before the baseline survey is completed. This may occur due challenges in communication and/ or delayed receipt (or non-receipt) of MIIC approval for study implementation.

III. EMPIRICAL APPROACH AND METHODOLOGY

The empirical approach of the FAS-IMCHN impact evaluation study is geared to the study objectives, as specified in Section I. The evaluation questions, which directly follow from the study objectives, are presented in the first subsection below. The second subsection presents the evaluation design. The third subsection discusses the preferred method for estimating the impact of FAS in detail; and the fourth subsection outlines the method for estimating the impact of IMCHN. The last subsection presents the outcome variables.

A. Evaluation Questions

The FAS-IMCHN impact evaluation study seeks to answer four *evaluation questions*: two *primary* evaluation questions and two *secondary* evaluation questions. The primary evaluation questions directly emerge from the primary project goal/objective, as defined by the project implementers (Section II). Hence, answering the primary evaluation questions will serve to help USAID in assessing the success of FAS and IMCHN (individually) relative to the stated project outcome (IFPRI 2017, p. 25). Hence, the two primary evaluation questions address the two (revised) specific study objectives (as specified in Section I). The secondary evaluation questions will serve to evaluate FAS and IMCHN in terms of achieving subordinate or subsequent project goals/objectives (Section II) and to generate a better understanding of the impact pathways. Hence, answering the secondary evaluation questions will also help to explain why (or why not) and how the observed changes in primary project outcome indicators occurred.

The primary evaluation questions are:

6) What is the impact of FAS interventions on household income (measured by total household expenditure) among smallholder farm households in Upper Egypt?

7) What is the impact of IMCHN interventions on maternal and child health and nutrition knowledge of community health workers (CHWs) in rural Upper Egypt?

The secondary evaluation questions are:

8) What are the effects of FAS interventions on intermediary project outcomes, including indicators of farm production and output, household food consumption and dietary diversity, and mothers' and children's diets and nutritional status?

9) What is the impact of IMCHN interventions on maternal and child health and nutrition knowledge among smallholder farm households in Upper Egypt?

B. Evaluation Design

Because FAS and IMCHN are inherently two different projects (but overlap spatially and temporally), the FAS-IMCHN impact evaluation study comprises two separate assessments:

1) FAS evaluation at the farm household level, and

2) IMCHN evaluation at the CHW level and farm household level.

For each of the two assessments, the 'immediate' project effects and the 'sustained' project effects will be estimated. The immediate project effects will be estimated by using the data from the baseline and follow-up I surveys. The sustained project effects will be estimated by using the baseline and follow-up II surveys. Thus, in technical terms, the FAS and IMCHN evaluations will use a *cohort* (also known as "*panel*") approach. A cohort approach means that subjects (e.g., households and CHWs) will be followed over time: the same subject will be assessed in a survey at baseline, that is, before the interventions have been implemented, and again in a follow-up survey.

Both the FAS evaluation and the IMCH evaluation will apply a *plausibility* design. Plausibility designs allow for attribution of impact to project interventions when implemented with appropriate rigor. The key challenge to impact evaluation is to determine what would have happened in the absence of the project, which is referred to as the 'counterfactual.' The counterfactual is constructed by finding a comparison group that is similar to the group receiving the intervention—the treatment group—on all relevant characteristics, except for receiving the intervention (Gertler et al. 2010; Khandker et al. 2010; White 2013). A plausibility design uses a non-experimental comparison group to minimize the possibility that the observed changes are due to non-intervention related factors. Hence, constructing a valid counterfactual using a non-randomized allocation of subjects (e.g., households) to treatment and comparison groups is the key methodological challenge of a plausibility design. Because the allocation of subjects is non-random, plausibility designs are also less rigorous than *probability* designs.

C. **Estimating FAS Impact**

The impact of FAS will be estimated using a *matching* method. Probably the best-known matching method is *propensity score matching (PSM)*. PSM estimates the average treatment effect of a project by matching treated subjects to their "most similar" comparison subject, calculating the individual treatment effect as the difference in outcomes between that treated subject and the nearest comparison subject, then computing the average treatment effect in the group. To quantify the idea of "most similar," the technique uses a propensity score, which simply condenses the information from many observable characteristics into a univariate measure. The propensity score is usually calculated by using a probit regression of the treatment status indicator on a variety of observable characteristics, with the predicted probability of treatment then being the propensity score.

An advantage of the PSM method is that it weights differences in outcomes between treated and non-treated subjects using a (probit) model for the probability that a household participates in the project as a function of observable household characteristics that affect the probability of treatment and the outcome variable. Thus, factors shaping project eligibility and the outcome effect contribute to the impact estimate. However, a critical empirical disadvantage of the PSM method is that hypothesis tests for whether the estimated impact is statistically significant cannot use typical analytical standard errors (derived from the regression model), because it is not possible to calculate analytical standard errors for these complex models. Instead, the typical approach for PSM models is to calculate bootstrapped standard errors, which involve repeated random draws of the data from within the sample to measure its variance properties. Methods for calculating standard errors by bootstrap are less efficient than estimating analytical standard errors, which can increase the probability of type II error in the hypothesis tests, or failing to identify an impact of the project when in fact there was an impact (Abadie and Imbens 2008).

Because of this shortcoming of PSM models, two other matching methods are more commonly used in impact evaluations in more recent years. One of them is known as *nearest neighbor matching (NMM)*. The NNM estimator shares many of the useful properties of the PSM estimator: (1) It relies on the same identifying assumptions described above; (2) it matches treated subjects to one or more non-treated subjects using pre-intervention characteristics; and (3) it estimates the average impact as the average of the difference in the outcome for each treated subject from a weighted average of outcomes for matched non-treated subjects. The differences between NNM and PSM derive primarily from the rule used to select comparable non-treated subjects from the sample and the weights used to construct the difference in weighted average outcomes. NNM, which is a form of "covariate matching," matches treated and non-treated subjects based directly on the observable characteristics. Each treated subject is matched to a group of non-treated subjects with the smallest average difference in pre-interventions characteristics, where this difference is determined using a multi-dimensional metric across all determinants. Thus, unlike PSM, NNM does not use project eligibility information to create the weights, but it does use information from all determinants. The other important difference is that NNM uses analytical standard errors, which makes it more efficient than PSM, leading to fewer type II errors.

The second alternative matching method is called *inverse probability weighted regression adjustment (IPWRA)*. This method is implemented in three steps: First, the probability that a subject is treated is estimated using a treatment model, usually with a probit or logit regression. The predicted probabilities are used to re-weight the sample by the inverse of the probability that each subject is in the treatment or comparison group. Second, the expected outcome is estimated for each subject using a weighted outcome model that includes both the observable characteristics used to estimate the treatment model and additional information. For example, if the outcome of interest is children's nutritional status, the outcome model may include the children's sex and age in addition to the households' socio-economic and demographic characteristics that were included in the treatment model. Baseline data on outcomes can also be used in this way to more precisely estimate treatment effects at follow-up. The outcome model is used to predict the expected outcome for each subject twice: once from the perspective (weights) of the probability of being in the treatment group and again from the perspective (weights) of the probability of being in the comparison group. Finally, the average outcome for treated and non-treated subjects is calculated. The difference between these two averages is the estimated treatment effect. The IPWRA model shares a limitation with the PSM model in that the standard errors must be estimated by bootstrap. An important advantage of the IPWRA model over the PSM and NNM models is that it is possible to directly control for selected observable characteristics that may be highly correlated with the outcome by including these variables directly as control variables in the final outcome regression model. For example, suppose that the outcome of interest is children's nutritional status. The IPWRA method allows to explicitly control for children's sex and age in the outcome model, which improves the precision in the model.

As with any method of estimating treatment effects, several assumptions are needed to justify the use of IPWRA: First, the conditional independence assumption must hold for the estimation of average treatment effects. This assumption states that no unobservable variable affects both the likelihood of treatment and the outcome of interest, after conditioning on covariates. Second, the assumption of independent and identically distributed (i.i.d.) variables must hold. This assumption means that the potential outcomes and the treatment status of each subject are independent of the potential outcomes and the treatment status of all other subjects in the sample. Third, the overlap assumption must hold. This assumption states that every observation in the sample must have a positive estimated probability of being treated.

In preliminary work using data from the baseline and follow-up I survey, IFPRI will experiment with the PSM, NNM, and IPWRA methods (and potentially other methods such as the difference-in-differences method) to determine the relative tradeoff in bias and efficiency from these three (and potentially other) models. Households and individuals will be matched on a variety of household and farm characteristics (e.g., household size and sex and age composition, horticulture cultivation, farm size, farm land quality, household location, etc.), individual characteristics (e.g., sex, age, attained education level, etc.), and—for IPWRA—baseline outcomes. The precise specifications of the estimation equations will be defined during data analysis, and the validity of variable inclusion will be statistically checked/tested (using balancing tests, among others).

D. **Estimating IMCHN Impact**

The estimation of the impact of IMCHN at the CHW level and the farm household level will follow the same approach. Under a plausibility design, the impact will be estimated comparing the outcomes at baseline—before the intervention—with the outcomes at follow-up. Because all CHWs will be treated by IMCHN and because all rural households with young children or pregnant women should be served by CHWs, comparison groups to treated CHWs and treated target households cannot be constructed. Therefore, baseline outcomes will be used as the counterfactual. This method is commonly known as 'before-after comparison' and assume that outcomes—that are, specific indicators of maternal and child health and nutrition knowledge—are unaffected by any factor other than the IMCHN interventions over the observation period.

The effects of IMCHN on outcome variables at the CHW and household levels will be estimated by *ordinary least squares (OLS)* regressions with *fixed effects* at the respective level of observation. The precise estimation model will be determined in preliminary work using data from the baseline and follow-up I surveys.

E. **Outcome Variables**

Corresponding to the study's evaluation questions (Subsection A), the impact evaluation will assess the effects of FAS and IMCHN on a number of primary and secondary outcomes.

The primary outcome of the FAS evaluation is: [42]

Household expenditure: Total household expenditure will be used as a proxy for household income. Household expenditure is easier to collect than household income and generally considered a more accurate measurement for real household income than measuring household income directly, since people are usually less reluctant to report household expenditure than income. Additionally, households usually tend to under-report income.

The secondary outcomes of the FAS evaluation are:

[42] Although "improve the nutritional status of women and young children"—typically measured by anthropometric indicators—is a stated FAS goal, IFPRI suggests not to consider anthropometric measurements as primary outcome indicators. This is because FAS is unlikely to achieve measurable changes in anthropometric indicators within the evaluation timeframe, and thus sample size calculations based on these indicators would yield very large survey sample sizes that are extremely difficult to implement. Anthropometric measurements will be collected as secondary outcome indicators.

1) *Farm production and output*: Farm production will be assessed by harvested yields. Farm output will include quantities sold, selling prices, and quantities used for home consumption. Production and output will be surveyed on a crop-by-crop basis for all crops—including the FAS-supported crops—cultivated during the season under evaluation.

2) Household dietary diversity: The Household Dietary Diversity Score (HDDS)—developed by FANTA (Swindale and Billinski 2006)—will be used to assess household-level dietary diversity. The food preparer in each household will be asked if the household consumed food from list of 12 pre-defined food groups in the past 24 hours prior to the interview, providing a simple score ranging from 0 to 12.[43]

3) Women's dietary diversity: The Minimum Dietary Diversity – Women (MDD-W) score—developed by FAO and FANTA (FAO and FHI360 2016)—will be used to assess dietary diversity of women. The methodology of the score resembles that of the HDDS.

4) Infant and Young Child Feeding (IYCF) practices: A standardized survey module—developed by WHO, FANTA, IFPRI, and others (WHO et al. 2010)—will be used to assess IYCF practices. The module includes a set of indicators including indicators related to children's dietary diversity.

5) Anthropometry of young children and their mothers/(female) caretakers: Weight and height measurements (and age for children) will be used to construct standard indicators of nutritional status, including height-for-age z-scores (HAZ), weight-for-age z-scores (WAZ), weight-for-height z-scores (WHZ), and BMI-for-age z-scores (BMIZ) for children and body-mass-index (BMI) for women. These indicators will be used to determine the prevalence rates of chronic, acute, and overall undernutrition among young children and the prevalence rates of overweight and obesity among their mothers/caretakers.

The primary outcome of the IMCHN evaluation is:

Nutrition and health knowledge: CHWs and mothers/child caretakers will be asked an identical series of questions related to child and maternal health and nutrition knowledge, including knowledge of danger signs of malnutrition and illness during pregnancy and childhood, recommended diets and unhealthy diets, appropriate IYCF practices (breastfeeding and complementary feeding), optimal hygiene practices for the prevention of diarrhea, and health risks associated with overweight and obesity.

The secondary outcomes of the IMCHN evaluation are identical with the FAS secondary outcomes 2-5.

[43] The 12 HDDS food groups are: cereals and grains; roots and tubers; legumes, nuts, and pulses; milk and dairy products; eggs; meat and poultry; fish and seafood; fruits; vegetables; oils and fats; sugar, honey, sweets and snacks; miscellaneous.

IV. CRITICAL ASSUMPTIONS

The proper and timely implementation of the FAS-IMCHN impact evaluation study and the baseline surveys in particular depends on the compliance with the following critical assumptions:

1) The FAS implementer will provide the final list of value chains to be promoted during the 2017-18 winter season and of the intervention areas that will be targeted for these value chains by no later than the end of July 2017, as agreed. (As of Nov. 29., 2017 the final list of all vegetable and herb/spice value chains to be implemented during the 2017-18 winter season is still pending.)

2) The FAS implementer will enroll 2,000 new farmers from (about) 55 associations/cooperatives to the 2017-18 winter season. The implementer will actually implement the project interventions for vegetable and spice/herb value chain development with these farmers. (It appears that the number of farmers to be newly enrolled in the 2017-18 winter season as well as the number of respective associations/cooperatives are much lower.)

3) The FAS implementer will provide complete and final lists of all associations/cooperatives and all individual farmers that will be enrolled to the 2017-18 winter season as soon as they become available and no later than one working week after the respective contracts are signed, as agreed. (The final list of FAS associations/cooperatives and participating farmers is still pending.)

4) The IMCHN implementer will conduct the nutrition and reproductive health trainings for the CHWs from the FAS intervention villages shortly after the completion of the baseline surveys in these villages, as agreed. (The final detailed training plan of IMCHN—by governorate and district—is still pending.)

5) IFPRI and El-Zanaty & Associations will be granted permission by the implementers of FAS and IMCHN and the responsible governmental agencies to conduct the baseline survey data collection and pilot test the questionnaires, as planned. (IFPRI expects to receive the last pending approval—from MIIC—in early December.)

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APPENDIX III: IMPLEMENTATION PROTOCOL OF HOUSEHOLD LISTING SURVEY

Household listing enumerators must strictly follow these instruction rules successively:

1. Go to FAS-participating association/cooperative and request and record the addresses of all farmers on the list provided by IFPRI and ask an association/cooperative representative to help you locating the farmers' households.

2. Go to the first FAS farm household (→ order of the visits of FAS farm households on the list does not matter).

3. Record address of FAS farm household before approaching any household member.

4. Knock on door of FAS household and apply household listing questionnaire.

    a. After you completed the questionnaire and if household is eligible for inclusion in the farm household baseline survey (see instruction on tablet), mark house on front door or wall and continue with Rule 5.

    b. If no household member is available, respondent is not an adult, or respondent requests revisit, revisit household. Revisit household in the afternoon of the same day if you visited it before noon (or at agreed time). If you visited the household after noon, revisit household on the next day in the morning (or at agreed time). If no adult is available during the first revisit, revisit household in the morning of the next day or in the evening of that day, respectively. Repeat the procedure until you completed three revisits (within a period of two days). If all revisits are unsuccessful, go to next FAS farm household on the list. Record each visit in the questionnaire.

    c. If respondent refuses to take part in the interview, go to next FAS farm household on the list. Record in the questionnaire.

5. Leave the house and apply the following walking rule: On an even date (calendar day), turn right (pass the house on your right-hand side), walk along the street, and select the fifth house on the same side of the street. On an uneven date (calendar day), turn left (pass the house on your left-hand side), walk along the street, and select the fifth house on the same side of the street. Cross any intersection.

    a. If you reached the end of the village before reaching the fifth house on the same side of the street (no more houses of this village in near side), cross the street and walk on the opposite side of the street toward the village center to continue until you reached the fifth house on that side of the street.

    b. If you have visited the household before, continue walking in the same direction and select the second house on the same side of the street.

6. Record address of the household before approaching any household member.

7. Knock on door of the household and apply household listing questionnaire.

    a. After you completed the questionnaire and if household is eligible for inclusion in the farm household baseline survey (see instruction on tablet), mark house on front door or wall and

continue with Rule 8. If the household is ineligible for inclusion in the farm household baseline survey, repeat Rules 5–7. Record in the questionnaire.

b. If no household member is available or respondent is not an adult, repeat Rules 5–7. Record in the questionnaire.

c. If respondent refuses to take part in the interview, repeat Rules 5–7. Record in the questionnaire.

8. Go to second FAS farm household and repeat Rules 3–7.

9. Go to third FAS farm household and repeat Rules 3–7.

10. Go to fourth FAS farm household and repeat Rules 3–7.

11. Go to fifth FAS farm household and repeat Rules 3–7.

12. After you have completed the fifth FAS farm household and the fifth comparison household, repeat Rules 5–7 to select the sixth comparison household.

13. If there is more than one FAS farm household in the same building, apply Rules 3–4 for each FAS farm household consecutively. Then, apply Rules 5–7 consecutively, with the number of repetitions (of Rules 5–7) for each visited FAS farm households.

14. For the non-FAS households, if you reach a building with more than one household, select the nearest household on your right-hand side on an even date and select the nearest household on your left-hand side on an odd date. The nearest household is the household on the ground floor of a multistory house or closest to you in a one-story compound. Apply Rules 6–7 to this household. However, if no household member is available, respondent is not an adult, respondent refuses to take part in the interview (Rule 7 a–b), or household is ineligible for inclusion in the baseline survey (see instruction on tablet), select the second-nearest household in the same building. If there are no available or eligible households in the building, apply Rules 5–7.

15. Start over again from Rule 2 onward, until you have completed visiting all farm households on the list of the association/cooperative (and respective comparison households).

16. If the last FAS farm household on the list is not the 5^{th}, 10^{th}, 15^{th}, 20^{th}, etc. household, repeat Rules 5–7 to select an additional comparison household.

17. Do not share any information of this sample selection with any enumerator or supervisor of the farm household baseline survey teams.

APPENDIX IV: DESCRIPTION OF QUESTIONNAIRES

Data were collected at the household and individual level using the household listing survey questionnaire and the farm household baseline survey questionnaires. The questionnaires of the farm household baseline survey contained the household questionnaire and the anthropometry questionnaire. The lists of modules included in the questionnaires are presented in Tables A.III.1–A.III.3 along with a brief description of each module.

Household Listing Survey Questionnaire

The household listing survey questionnaire was designed to collect information on FAS participants (that are, farmers on the list provided by the FAS) and non-FAS participants (that are, farmers in the same village who do not participant in the program) to compile the final list of households that were interviewed during the farm household baseline survey. The first part of the questionnaire screened FAS participants based on the selection criteria established by the program: information on the household's engagement in forward contracts during the winter season 2017–18 or the summer season 2017, land size, and production of vegetables and herbs and spices in any of these seasons. The second part of the questionnaire collected similar information that allowed us to select similar households for the comparison group. In addition, the questionnaire gathered information on household members' attendance to information meetings organized by FAS, participation in training sessions on marketing, and production of vegetables, and herbs and spices. Also, information on the number and frequency of Raedat Refiat visits during the last 12 months was collected to assess the frequency with which households were reached by IMCHN during the previous year. Table A.III.1 shows the structure and content of the household listing survey questionnaire.

Table A.IV.1. Overview of modules included in the household listing survey questionnaire

Module	Topic	Description	Respondent
1	Raedat Refiat	Identifies if the household was visited by a Raeda Refia in the previous 12 months and in case of any visit, how many times and the date of each visit.	Any mother of child 6–59 months old or any knowledgeable woman in the household.
2	Farming activities	Different modules were administered to FAS and non-FAS households.	Household head or person with most knowledge on agricultural activities.
A	FAS households	Investigates FAS households' status in the program by collecting information on having signed an oral or written contract with a buyer (for winter season 2017–18 and summer 2017), land size (for winter season 2017–18 and summer 2017), production of vegetables and herbs/spices (for winter season 2017–18 and summer 2017), attendance to information meetings organized by FAS (for winter season 2017–18 and summer 2017), participation in FAS trainings (for winter season 2017–18 and summer season 2017).	Any member of the household above age 18.

Module	Topic	Description	Respondent
B	Non-FAS households	Identifies non-FAS households who can be part of the comparison group by collecting information on having contracts signed an oral or written contract with a buyer (winter 2017–18 and summer 2017), land size, production of vegetables and herbs/spices in the last 5 years, production of vegetables and herbs/spices (for winter season 2017–18 and summer 2017), attendance to information meetings organized by FAS (for winter season 2017–18 and summer 2017), participation in FAS trainings (for winter season 2017–18 and summer 2017).	Any member of the household above age 18.

Source: Own representation.

Farm Household Baseline Survey: Household Questionnaire

The household questionnaire of the farm household baseline survey gathered information on household demographics and socioeconomic indicators, food security and nutrition, income sources, participation in social assistance and development programs, household's consumption and expenditures, agriculture, maternal and child characteristics, and community health workers services. Table A.III.2 presents the modules included in the questionnaire and a short description of each module.

Table A.IV.2. Overview of modules included in the household questionnaire of the farm household baseline survey

Module	Topic	Description	Respondent
1	Household roster and education	Information on the composition of the household, including designation of the head of household, a list of all household members, their age and sex, and their relationship to the head of household, (biological) parents of the children less than 5 years of age. Highest educational level attained (for all household members above age 3) and occupation in the past 12 months of all household members 5 years of age and older.	Head of household (HH) or any well-informed member in the household older than 18 years old.
2	Eligible child	Identifies all children from 0–23 months and 24–59 months of age.	HH, spouse, or HH member over 18 years old.
3	Housing	Construction materials used for floor, walls and roof; availability of water and electricity; and sanitation.	HH or main farmer.
4	Assets	Identifies the possession of durable household goods (in working condition).	HH or main farmer.
5	Income sources and social protection	Identifies external sources of income, including transfers from social programs, remittances, and support from NGOs. It also identifies current participation in development program and in the last 10 years.	HH or any well-informed member in the household older than 18 years old.
6	Household food consumption and expenditure	Investigates consumption of different food groups for household's members on a 7-day recall basis.	Main food shopper and main meal preparer.
7	Outside-home food consumption	Investigates consumption of food outside the household for household members on a 7-day recall basis.	Main food shopper and main meal preparer.
8	Monthly nonfood expenditures	Investigates expenditures on nonfood products for all household members on a 4-week recall basis, including costs of tobacco, rents, energy, transportation, etc.	HH or main farmer.
9	Yearly nonfood expenditures	Investigates expenditures on nonfood products for all household members on a 12-week recall basis, including costs of clothing, lodging, durable goods, social events, etc.	HH or main farmer.
10	Agricultural assets and livestock	Investigates possession of agricultural durable goods, including tractor, sprayers, water pumps, etc. Also investigates ownership livestock.	Main farmer or person in the household most knowledgeable in agriculture and farming.

Module	Topic	Description	Respondent
11	Farmland	Investigates characteristics of land possessed or rented by the household during the summer and winter seasons, by plot.	Main farmer or person in the household most knowledgeable in agriculture and farming.
12	Crop production and harvest	Investigates production of primary and secondary crops during the summer and winter season by plot and crop. Information collected includes area cultivated, quantities harvested for each crop, marketing channels, prices, use of fertilizers, use of pesticides, labor inputs. etc.	Main farmer or person in the household most knowledgeable in agriculture and farming.
13	Costs of inputs	Investigates costs of fertilizers, pesticides, and labor used for producing crops.	Main farmer or person in the household most knowledgeable in agriculture and farming.
14	Household dietary diversity	Evaluates the diversity of the household diet in the last 24 hours.	Meal preparer.
15	Mother's dietary diversity	Evaluates the diversity of mother's diet in the last 24 hours.	Mother of child or caretaker.
16	General health and nutrition knowledge	Evaluates knowledge on hygiene practices, feeding, nutritional value of different foods, and perceptions of obesity.	Mother of child 0–59 months of age or any caretaker.
17	Mother/caretaker health and nutrition knowledge	Evaluates knowledge on child health, healthcare seeking, feeding, and danger signs during pregnancy.	Mother of child 0–59 months of age or any caretaker.
18	IYCF practices	Investigates breastfeeding and infant and young child feeding.	Mother of children 0–23 months of age or caretaker.
19	Community health workers services	Investigates community health workers' services, including visits, information provided on pregnancy, maternal and child health, and nutrition.	Mother of child 0–59 months of age or any caretaker or any woman 15–49 years old.

Source: Own representation.

Farm Household Baseline Survey: Anthropometry Questionnaire

The anthropometry questionnaire of the farm household baseline survey was used to record height (or length) and weight of all children 0–59 months old and all women of reproductive age (15–49 years). The modules of the questionnaire are shown in Table A.III.3.

Table A.IV.3. Overview of modules included in the anthropometry questionnaire of the farm household baseline survey

Module	Topic	Description	Respondent
1	Child anthropometry	Child weight and length/height was measured. Length or height was measured twice and a third time if the difference between the first two measurements exceeded 6 mm. Weight was measured twice and a third time if the difference between the first two measurements exceeded 300 g.	All children 0–59 months of age.
2	Woman anthropometry	Women's height and weight were measured, and pregnancy status recorded. Maternal height and weight was measured once.	All women 15–49 years of age.

Source: Own representation.

APPENDIX V: LISTING QUESTIONNAIRE

Agriculture and Nutrition in Rural Upper Egypt

HOUSEHOLD LISTING SURVEY

INFORMATION OF HOUSEHOLD HEAD		
	NAME	CODE
FIRST NAME	_____	
FATHER'S NAME	_____	
FAMILY NAME.....	_____	
STREE NAME AND NUMBER ……	_____	
GOVERNORATE	_____	[__|__]
MARKAZ	_____	[__|__]
VILLAGE	_____	[__|__]
SUBVILLAGE	_____	[__|__]
Adress (in detailed):	_____	
HOUSEHOLD IDENTIFICATION NO. (HID)		[__|__|__]
MOBILE PHONE	[__|__|__|__|__|__|__|__|__|__|__]	
LANDLINE NUMBER FOR HOUSEHOLD OR ANOTHER MOBILE NUMBER WITHIN HOUSEHOLD	[__|__|__|__|__|__|__|__|__|__|__]	

INFORMATION FOR MAIN INFORMANT	
FIRST NAME	_____
FATHER'S NAME	_____
FAMILY NAME.....	_____

PERSON IDENTIFICATION NO. (IDP) OF THE RESPONDENTS.....	[__|__]	[__|__]
FIRST NAME, FAMILY NAME AND CODE OF THE ENUMERATOR	_____	[__|__]

DATE OF INTERVIEW	DAY [__|__]	MONTH [__|__]
START TIME	[__|__][__|__] HRS MIN	
END TIME	[__|__][__|__] HRS MIN	
RESULT CODE	_____	[__]

HOUSEHOLD LISTING SURVEY

RESULT CODES
1 = COMPLETED
2 = INCOMEPLETE
3 = NOT AVAILABLE
4 = REFUSED
5 = REVISIT 1ST TIME (FAS HOUSEHOLD)
6 = REVISIT 2ND TIME (FAS HOUSEHOLD)
7 = REVISIT 3TH TIME (FAS HOUSEHOLD)

Respondent: any mother of children 6-59 months old or any knowledgeable woman in the HH.

1	Has a CHW visited this household during the past 12 months?	Yes ……..1 No ……0	**→Q4**
2	How many times?	[___|___]	
3	When (each time)	Month [__|__] Year [__|__|__|__]	

INTERVIEWER: COMPLETE NEXT QUESTION BEFORE APPROACHING THE HOUSEHOLD

4	Is this household in the FAS houseold list?	Yes.....1 No……...0	**→Q5** **→Q6**

Agriculture and Nutrition in Rural Upper Egypt

HOUSEHOLD LISTING SURVEY

INTERVIEWER: APPROACH HOUSEHOLD AND KNOCK ON THE DOOR. READ LETTER OF CONSENT TO RESPONDENT. CHECK IF RESPONDENT IS AN ADULT HOUSHEOLD MEMBER

Read to the respondent:

I, [First Name, Family Name of Scouter], am a member of a team that studies the conditions of agriculture and the living standard, health, and nutrition of farmers and their family members in rural areas of Upper Egypt. I am employed by El-Zanaty & Associates, which is a private survey firm from 6th of October City, near Cairo.

We will conduct a survey in your village in the next days. We randomly selected your household to participate in the study. Because the study focuses on a specific group of farm households, I would like to briefly assess if your household fulfills the criteria for participation in the study. If so, I would like to kindly invite you to participate in the survey that will be conducted by my colleagues.

Today's interview will take only about 5 minutes of your time.
The information you give us will not be disclosed to anyone. It will be kept strictly confidential. The purpose of the study is exclusively a research one. Your participation in the interview is voluntary. Your participation does not involve any foreseeable risks or discomforts for you or your family. I hope that you agree to participate in this short interview, and I am looking forward to your genuine responses.
If you agree to participate in today's interview, I would like to start my questions now.

HOUSEHOLD LISTING SURVEY

5	Do you agree to participate in today's short interview?	Yes ……...1 No, respondent refuses to participate ……2 No, respondent is no (knowledgeable) adult household member (18 years or older)…..……3 Not now, respondent requests revisit ……4 No respondent available in household …….……5	**→SECTION A** **→ END INTERVIEW** **→ END INTERVIEW, REVISIT** **→ END INTERVIEW, REVISIT** **→ REVISIT**

6	Do you agree to participate in today's short interview?	Yes ……1 No, respondent refuses to participate ……2 No, respondent is no (knowledgeable) adult household member (18 years or older)……3 No respodnent available ..……...4	**→ SECTION B** **→ END INTERVIEW,** **→ END INTERVIEW,** **→ END INTERVIEW,**

HOUSEHOLD LISTING SURVEY

INTERVIEWER: TELL THE RESPONDENT THAT, FOR THIS INTERVIEW, THE FOLLOWING DEFINITION OF A HOUSEHOLD WILL BE USED

READ: A household is a group of people who have usually slept in the same dwelling and share their meals together.

A. FAS HOUSEHOLD

A1	Has anyone in your household committed to a **FAS-facilitated contract** signed by a farmer association/agricultural cooperative or or with association in the previous winter season (2017-2018)? **EXPLAIN: FAS IS THE FOOD SECURITY AND AGRIBUSINESS SUPPORT PROJECT. IT IS IMPLEMENTED BY CNFA (CULTIVATING NEW FRONTIERS IN AGRICULTURE)**	Yes, sgined contract .....1 Yes, oral contract.....2 No……..……0 I don't know……..……8	**→ A4** **→ END INTERVIEW**
A2_a	When did that person committed to a FAS-facilitated contract signed by a farmer association/cooperative or with association?	Month [___|___] Year [___|___|___|___]	
A2	For which crops your household or the farmer association/agricultural cooperative committed to a FAS facilitated contract in the winter season (2017-2018)? **READ OPTIONS** **RECORD ALL MENTIONED**	Onion……..Yes No I don't know Green Beans……Yes No I don't know Tomato……..Yes No I don't know Fennel……..Yes No I don't know Herbs and spices (peppermint, henna, basil, cumin, black seed, coriander, stevia, moonflower, etc.) ……Yes No I don't know Other crops……Yes No I don't know **SPECIFY** _____	
A3	How much land was either owned or rented by your household in total winter season (2017-2018)?	FEDDAN [___|___] KIRAT [___|___] SAHM [___|___]	
A4	Has anyone in your household committed to a **FAS-facilitated contract** signed by a farmer association/agricultural cooperative or or with association in the previous summer season (2017)? **EXPLAIN: FAS IS THE FOOD SECURITY AND AGRIBUSINESS SUPPORT PROJECT. IT IS IMPLEMENTED BY CNFA (CULTIVATING NEW FRONTIERS IN AGRICULTURE)**	Yes, sgined contract .....1 Yes, oral contract.....2 No……..……0 I don't know……..……8	**→ END INTERVIEW** **→ END INTERVIEW**
A5	When did that person committed to a FAS-facilitated contract signed by a farmer association/cooperative or with association?	Month [___|___] Year [___|___|___|___]	
A6	For which crops your household or the farmer association/agricultural cooperative committed to a FAS facilitated contract in the summer season (2017)? **READ OPTIONS** **RECORD ALL MENTIONED**	Green Beans……Yes No I don't know Onion……..Yes No I don't know Sweet potato…...Yes No I don't know Basil……..Yes No I don't know	

HOUSEHOLD LISTING SURVEY

		Geranium……..Yes No I don't know Fennel…….Yes No I don't know Marjoram……..Yes No I don't know Fruits (pomegranate, table grapes, etc)…….Yes No I don't know Other herbs and spices (thyme, anise, calendula, parsley, cumin, etc.)…….Yes No I don't know **SPECIFY** _____				
A7	How much land was either owned or rented by your household in total summer season (2017)?	FEDDAN [___|___]	KIRAT [___|___]	SAHM [___|___]		
A8	Has anyone in your household ever attended a FAS meeting?	Yes..... …...1 No……..……0			**→Q.A10**	
A9	When was the last time anyone in your household attended a FAS meeting?	DAY [___|___]	MONTH [___|___]	YEAR [___|___]		
A10	Has anyone in your household attended a FAS training session for producing and marketing vegetables or herbs and spices?	Yes..... …...1 No……..……0			**→ END INTERVIEW**	
A11	When was the last time anyone in your household attended a FAS training session for producing and marketing vegetables or herbs and spices?	DAY [___|___]	MONTH [___|___]	YEAR [___|___]		

HOUSEHOLD LISTING SURVEY

B. NON-FAS HOUSEHOLD

B1	Is anyone in this household a farmer?	Yes ..... 1 No……..0	**→END INTERVIEW**
B2	How much land is either owned or rented by your household in total? **RECORD TOTAL SIZE INCLUDING ALL FIELDS OWNED OR RENTED BY THE HOUSEHOLD**	FEDDAN | KIRAT | SAHM [___|___] [___|___] [___|___]	
B3	Does anyone in your household produce vegetables or herbs and spices in this winter season (2017-2018)?	Vegetables (onion, green beans, tomato, sweet potato) Yes ☐ No I don't know Herbs and spices (fennel, basil, marjoram, anise, parsley, mint, geranium) Yes ☐ No I don't know No……0 I don't know……..8	**→END INTERVIEW**
B4	Does anyone in your household produce vegetables or herbs and spices in the previous summer season (2017)?	Yes ..... …..1 No……0 I don't know……..8	**→END INTERVIEW**
B5	Has anyone in your household produced vegetables or herbs and spices in the past 5 years (from 2012-2013 winter seaons onwards)?	Yes, ... …..1 No……0 I don't know……..…8	**→END INTERVIEW** **→END INTERVIEW**
B6	Have you or anyone in your household committed to FAS contract in the last summer season (2017) or the last winter season (2016-2017)? If yes: is it an oral contract or signed contract? **EXPLAIN: FAS IS THE FOOD SECURITY AND AGRIBUSINESS SUPPORT PROJECT. IT IS IMPLEMENTED BY CNFA (CULTIVATING NEW FRONTIERS IN AGRICULTURE)**	Yes, sgined contract..... 1 Yes, oral contract ..... 2 No……0 I don't know……..8	**→ END INTERVIEW** **→ END INTERVIEW** **→ END INTERVIEW**
B7	Have you or anyone in your household committed to FAS contract or with association or this winter season (2017-2018)? If yes: is it an oral contract or signed contract?	Yes, sgined contract..... 1 Yes, oral contract ..... 2 No……0 I don't know……..8	**→ END INTERVIEW** **→ END INTERVIEW** **→ END INTERVIEW**
B8	During the last year, Has anyone in your household ever attended a FAS meeting? **EXPLAIN: FAS IS THE FOOD SECURITY AND AGRIBUSINESS SUPPORT PROJECT. IT IS IMPLEMENTED BY CNFA (CULTIVATING NEW FRONTIERS IN AGRICULTURE)**	Yes ..... …..1 No……..0 I don't know……..…..8	**→Q.B10** **→Q.B10**
B9	When was the last time anyone in your household attended a FAS meeting?	DAY | MONTH | YEAR [___|___] [___|___] [___|___]	

HOUSEHOLD LISTING SURVEY

B10	Has anyone in your household attended a FAS training session for producing and marketing vegetables or herbs or spices?	Yes.....1 No……..0			**→ END INTERVIEW**
B11	When was the last time anyone in your household attended a FAS training session for producing and marketing vegetables or herbs or spices?	DAY	MONTH	YEAR	
		[___|___]	[___|___]	[___|___]	

Thank you for taking the time to complete this interview.

APPENDIX VI: FARM HOUSEHOLD QUESTIONNAIRE

Agriculture and Nutrition in Rural Upper Egypt
FARM HOUSEHOLD BASELINE SURVEY

LETTER OF INTRODUCTION

Read to the household head:

We, [Name of Enumerator 1] and [Name Enumerator 2], are members of a team that study the conditions of agriculture and the living standards, health, and nutrition of farmers and their family members in rural areas of Upper Egypt. We are conducting a survey to learn from you and many other households that earn money from agriculture, conditions of you, your household, and other households. We are employed by El-Zanaty & Associates, which is a private survey firm from 6th of October City, near Cairo. El-Zanaty & Associates conducts the survey on behalf of non-profit international organization.

We would like to interview, the main farmer in your household, and the person who mostly prepares food in your household and mostly takes care of the children. The interview will last about 1.5 hours.

Later today, two of our colleagues will visit you. They would like to measure the weight and height of two young children (if applicable) and their biological mother (or main caretaker) and biological father (or the household head and his wife).

The information you give us and the measurements we take of you and your family members will not be disclosed to anyone. They will be kept strictly confidential.

Your and your family's participation in the survey is voluntary. You have the right to not participate if you do not want to. You also have the right to refuse to answer specific questions, or to not participate in the weight and height measuring or blood testing or to discontinue the interview at anytime. Not participating will not affect you or your family in any way.

The information and measurements you and your family provide will be used to better understand the agricultural production conditions and the living standards and health and nutritional statuses of farming families in Upper Egypt.

Your participation does not involve any foreseeable risks or discomforts for you or your family. There are also no direct benefits, but we hope that the findings of the study will be used by policy makers and implementers of rural development projects to improve the living standards and health and nutrition of farm households in Upper Egypt.

For this, we need your genuine responses and hope that you agree to participate in this study since your knowledge and views are important.

Do you agree to participate in this study? Yes……..1
No ……0

Name and signature of enumerator _____
Date _____

Agriculture and Nutrition in Rural Upper Egypt

BASELINE HOUSEHOLD SURVEY

	NAME | CODE
GOVERNORATE	_____ [__|__]
MARKAZ	_____ [__|__]
VILLAGE	_____ [__|__]
SUBVILLAGE	_____ [__|__]
HOUSEHOLD IDENTIFICATION NO. (HID)	[__|__|__]
FIRST NAME OF HH HEAD	_____
FATHER'S NAME OF HH HEAD	_____
FAMILY NAME OF HH HEAD	_____
MOBILE PHONE OF CONTACT PERSON.....	[__|__|__|__|__|__|__|__|__|__]
LANDLINE NUMBER FOR HOUSEHOLD OR ANOTHER MOBILE NUMBER WITHIN HOUSEHOLD	[__|__|__|__|__|__|__|__|__|__]
PERSON IDENTIFICATION NO. (IDP) OF THE RESPONDENTS.....	[__|__]
FIRST NAME, FAMILY NAME AND CODE OF THE ENUMERATOR 1 (FEMALE)	_____ [__|__]
FIRST NAME, FAMILY NAME AND CODE OF THE ENUMERATOR 2 (MALE)	_____ [__|__]
FIRST NAME, FAMILY NAME AND CODE OF THE SUPERVISOR	_____ [__|__]

DATE OF VISIT	[__|__][__|__][__|__] DAY MONTH YEAR
START TIME	[___|___][___|___] HRS MIN
END TIME	[___|___][___|___] HRS MIN
RESULT CODE	[___] _____

RESULT CODES
8 = COMPLETE
9 = PARTIALLY COMPLETE
10 = NO AVAILABLE RESPONDENT
11 = REFUSAL
12 = OTHER **(SPECIFY)**

Gov. [__|__] Markaz [__|__] HID [__|__|__]

1. HOUSEHOLD ROSTER

RESPONDENT: HOUSEHOLD HEAD OR ANY WELL INFORMED MEMBER IN THE HOUSEHOLD OLDER THAN 18 YEARS OLD AND KNOWS HOUSEHOLD CONDITIONS.

Respondent's name and IDP **RECORD FULL NAME**
_____ IDP [___|___]
Name

INTERVIEWER: TELL THE RESPONDENT THAT, FOR THIS INTERVIEW, THE FOLLOWING DEFINITION OF A HOUSEHOLD WILL BE USED

READ: ***A household is a group of people who have usually slept in the same dwelling and share their meals together.***

	ALL HOUSEHOLD MEMBERS					
1	**2a**	**2b**	**2c**	**3**	**4**	**5**
Person's ID # **(IDP)**	Please give me the first name, followed by father's name and family, of all persons living in your household, **starting with the head of the household** **RECORD HEAD OF HOUSEHOLD FOR IDP 01** **FIRST NAME**	What is his/her father's name? **FATHER'S NAME**	What is his/her family name? **FAMILY NAME**	[NAME] Male or Female? 1 -Male 2 -Female	What is [NAME]'s relationship to [HH HEAD'S NAME]; that is, to the head of the household? (**LIST A**)	How old is [NAME]? 00- under 1 year old 95 -95 or older **COMLETED YEARS OF AGE**
IDP	NAME			CODE	CODE	YEARS
01				1 2	[__|__]	[__|__]
02				1 2	[__|__]	[__|__]
03				1 2	[__|__]	[__|__]
04				1 2	[__|__]	[__|__]
ADD ROWS FOR EACH ADDITIONAL MEMBER: MAXIMUM 25 MEMBERS						

1. HOUSEHOLD ROSTER

	MEMBERS OLDER THAN 12 YEARS			CHILDREN YOUNGER THAN 5 YEARS		
1	**6**	**7**	**8**	**9a**	**9b**	**9c**
Person's ID # **(IDP)**	What is [NAME]'s marital status? (**LIST B**) **GO TO Q16 IF RESPONSE IS NOT 2**	Does [HH HEAD'S NAME] have more than one living spouse? 1- Yes 0 - No → **Q16**	Do all spouses of [HH HEAD'S NAME] live in this house or in different houses? 1 - This house 2 - Different house	What is [NAME]'s birth day? 98 = DOES NOT KNOW	What is [NAME]'s birth month? 98 = DOES NOT KNOW THE MONTH	What is [NAME]'s birth year? 9998 = DOES NOT KNOW
IDP	CODE	CODE	CODE	DAY	MONTH	YEAR
01	[__|__]	1 0	1 2	[__|__]	[__|__]	[__|__|__|__]
02	[__|__]			[__|__]	[__|__]	[__|__|__|__]
03	[__|__]			[__|__]	[__|__]	[__|__|__|__]
04	[__|__]			[__|__]	[__|__]	[__|__|__|__]
ADD ROWS FOR EACH ADDITIONAL MEMBER: MAXIMUM 25 MEMBERS						

Gov. [__|__] Markaz [__|__] HID [__|__|__]

1. HOUSEHOLD ROSTER

	CHILDREN YOUNGER THAN 5 YEARS							
1				**10**	**11**	**12**	**14**	**15**
Person's ID # (IDP)	INTERVIEWER: RECODE CHILD'S AGE IN MONTHS	CIRCLE THE LINE NUMBER OF ALL CHILDREN AGE 0-23 MONTHS	CIRCLE THE LINE NUMBER OF ALL CHILDREN AGE 24-59 MONTHS	Birth date obtained from: 1= Passport / ID card /birth certificate 2 = Forensic identification document 3 = Vaccination card 4 = Other official document 5 = Memory	Is the biological mother of [CHILD] living in this household? 1 - Yes 0- No	Who is the biological mother/ the main caretaker of [CHILD]?	Is the biological father of [CHILD] living in this household? 1 - Yes 0 - No→**Q16/NEXT MEMBER**	Who is the biological father of [CHILD]?
IDP				CODE	CODE	IDP	CODE	IDP
01	[__|__]	01	01	1 2 3 4 5	1 0	[__|__]	1 0	[__|__]
02	[__|__]	02	02	1 2 3 4 5	1 0	[__|__]	1 0	[__|__]
03	[__|__]	03	03	1 2 3 4 5	1 0	[__|__]	1 0	[__|__]
04	[__|__]	04	04	1 2 3 4 5	1 0	[__|__]	1 0	[__|__]
ADD ROWS FOR EACH ADDITIONAL MEMBER: MAXIMUM 25 MEMBERS								

1. HOUSEHOLD ROSTER

FOR HOUSEHOLD MEMBERS 3 YEARS AND OLDER				MEMBERS 3-24	FOR HOUSEHOLD MEMBERS 5 YEARS AND OLDER		
1	**16**	**17**	**18**	**19**	**20**	**21**	**22**
Person's ID # **(IDP)**	Has [NAME] ever attended school? 1 - Yes 0 - No → **Q20/NEXT MEMBER**	What is the highest education level attained by [NAME]? (**LIST C**)	Which was the last grade completed by [NAME] at this level?	Is [NAME] presently in school? 1 - Yes 0 - No	What was [NAME]'s **main** occupation **during the past 12 months** (work, housewife, etc.)? (**LIST D**)	Did [NAME] have another occupation during the past 12 months? 1 - Yes 0 - No → **Q25/NEXT MEMBER**	What was [NAME]'s (most important) secondary occupation during the past 12 months? (**LIST D**)
IDP	CODE	CODE	GRADE	CODE	CODE	CODE	CODE
01	1 0	[__|__]	[___]	1 0	[__|__]	1 0	[__|__]
02	1 0	[__|__]	[___]	1 0	[__|__]	1 0	[__|__]
03	1 0	[__|__]	[___]	1 0	[__|__]	1 0	[__|__]
04	1 0	[__|__]	[___]	1 0	[__|__]	1 0	[__|__]
ADD ROWS FOR EACH ADDITIONAL MEMBER: MAXIMUM 25 MEMBERS							

23 Just to make sure I have a complete list, are there any other persons, such as small children or infants, who are not listed and usually live here? Yes.....1 No .....0 → **ADD TO THE TABLE**

24 Are there any other persons who may not be family members, such as servants, employees, renters or friends, who usually sleep in the same dwelling and share meals with the members of this household? Yes.....1 No .....0 → **ADD TO THE TABLE**

Eligibility

25 Who is the person in this household with most knowledge about household land and agriculture? **IDP** ……[__|__]

26 Who is the person in this household who usually purchase food for the family? **IDP** ……[__|__]

27 Is this person prepares the food for the family? **IDP** ……[__|__]
IF NO: who is the person in the household who usually prepares the food for the family?

WOMEN AND CHILDREN WHO ARE ELIGIBLE FOR ANTHROPOMETERY

Gov. [___|___] Markaz [___|___] HID [___|___|___]

1. HOUSEHOLD ROSTER

CHECK AND RECORD ALL WOMEN AGE 15-49 YEARS, ALL CHILDREN AGE 0-59 MONTHS

NAME	LINE NO.
	[___|___]
	[___|___]
	[___|___]
	[___|___]

LIST A
RELATIONSHIP WITH HEAD OF HOUSEHOLD

01 = HEAD OF HOUSEHOLD
02 = 1ST SPOUSE
03 = 2ND SPOSE
04 = 3RD SPOUSE
05 = 4TH SPOUSE
06 = OWN CHILD
07 = SON'S WIFE/DAUGHTER'S HUSBAND
08 = MOTHER / FATHER
09 = SISTER / BROTHER
10 = AUNT / UNCLE
11 = COUSIN
12 = NIECE / NEPHEW
14 = GRANDDAUGHTER / GRANDSON
15 = SISTER IN LAW / BROTHER IN LAW
16 = DAUGHTER IN LAW / SON IN LAW
17 = MOTHER IN LAW / FATHER IN LAW
18 = CHILD IN CARE OF HOUSEHOLD
19 = EMPLOYEES, SERVANTS
20 = BROTHER'S WIFE/SISTER'S HUSBAND

96 = OTHER (**SPECIFY**)
98 = DOES NOT KNOW

LIST B
MARITAL STATUS

01 = NEVER MARRIED / SINGLE
02 = MARRIED LIVING WITH SPOUSE
03 = MARRIED LIVING SEPARATELY
04 = COMMON LAW UNION
05 = WIDOWED
06 = DIVORCED

97 = OTHER (**SPECIFY**)
98 = DOES NOT KNOW

LIST C
EDUCATION LEVEL

01 = KINDERGARTEN
02 = PRIMARY
03 = PREPARATORY
04 = GENERAL SECONDARY
05 = TECHNICAL SECONDARY
06 = MIDDLE INSTITUTE
07 = HIGHER INSTITUTE
08 = UNIVERSITY
09 = POST GRADUATE
10 = KOTTAB

GRADE
00 = LESS THAN A YEAR COMPLETED
98 = DOES NOT KNOW

LIST D
ACTIVITIES

01 = FARMER ON OWN / FAMILY LAND
02 = FARMER ON SOMEONE ELSE'S LAND
03 = STOCKMAN
04 = AGRICULTURAL WORKER (FOR WAGE OR IN-KIND PAY)
05 = NON-AGRICULTURAL WORKER (FOR WAGE OR IN-KIND PAY)
06 = AGRICULTURAL TRADER / MARKETER
07 = RETAILER (i.e., HAS A STORE)
08 = OTHER PRIVATE BUSINESSMAN / PRIVATE SECTOR EMPLOYEE
9 = OTHER PUBLIC SECTOR EMPLOYEE (e.g., TEACHER, NURSE, ADMINISTRATOR)

10 = HOUSEWIFE (UNPAID)
11 = DOMESTIC WORKER (FOR WAGE OR IN-KIND PAY)

12 = STUDENT
13 = DISABLED / RETIRED
14 = UNEMPLOYED

96 = OTHER **(SPECIFY)**
98 = DOES NOT KNOW

3. HOUSING CONDITIONS

RESPONDENT: HOUSEHOLD HEAD OR MAIN FARMER IN THE HOUSEHOLD
READ: I would like to ask you questions about your dwelling. The dwelling includes all rooms and separated structures used by members of your household.

Responted's name and IDP
_____ IDP [___|___]
Name

1	**CHECK: WHAT TYPE OF DWELLING DOES THE HOUSEHOLD LIVE IN?** **ONE ANSWER**	Apartment ..... 01 Free standing house ……...02 More than one appartment ..... 03 One room or more in the same unit .....04 One independant room or more.....05 Other (**SPECIFY**) 96	
2	**CHECK: WHAT IS MAIN CONSTRUCTION MATERIAL OF OUTSIDE WALLS?** **ONE ANSWER**	Concrete / cement .....01 Red/ white bricks ……..02 Clay bricks .....03 Cement bricks / stone .....04 Corrugated metal sheet .....05 Soil / sand and straw / plant material .....06 Other **(SPECIFY)** 96	
3	**CHECK : WHAT IS MAIN CONSTRUCTION MATERIAL OF THE ROOF?** **ONE ANSWER**	Thatch / straw.....01 Corrugated metal sheet .....02 Plastic / bitumen roof sheet .....03 Concrete / cement .....04 Wood ……..05 Other **(SPECIFY)** 96	
4	**CHECK: WHAT IS MAIN CONSTRUCTION MATERIAL OF THE FLOOR?** **ONE ANSWER**	Soil / sand (natural floor).....01 Concrete / cement .....02 Ceramic / marble tiles .....03 Cement tiles .....04 Other **(SPECIFY)** 96	
5	How many rooms in the dwelling are used by your household? **DO NOT INCLUDE BATHROOMS AND TOILETS. FOR ROOMS SUCH AS STORAGE AREAS OR ROOMS WHERE ANIMALS ARE KEPT, THEY ARE INCLUDED IF THEY ARE USED BY THE MEMBERS OF THE HOUSEHOLD TO SLEEP OR FOR OTHER ACTIVITIES**	**ROOMS** [___|___]	
6	Are other households sharing this dwelling with you?	Yes .....1 No.....0	
7	Is your dwelling owned or rented by your household? Or, does the household live there free of charge? **IF OWNED:** Is it owned solely by your household or jointly with someone else?	Owned.....01 Owned jointly.....02 Rented.....03 Free.....04 Other **(SPECIFY)** 96	

3. HOUSING CONDITIONS

8	What is the <u>main source</u> of drinking water for members of your household? **ONLY ONE ANSWER**	Tap inside the dwelling .....01 Tap in the yard/plot .....02 Public tap / standpipe.....03 Bottled water .....04 Other **(SPECIFY)** .....96 Does not know 98	
9	Do you <u>usually</u> treat your water to make it safer to drink?	Yes .....1 No.....0	→ **Q11**
10	How do you treat your water to make it safer to drink? What else? **RECORD ALL ANSWERS** **DO NOT READ RESPONSES** **AFTER EACH ANSWER, ASK « WHAT ELSE ? »**	Boil water ..... A Let it stand and settle..... B Water filter..... C Put water container into the sun ..... D Zeer ..... E Use chlorine .....F Other **(SPECIFY)** .....X Does not know .....Z	
11	Is there electricity in your household?	Yes .....1 No.....0	
13	**INTERVIEWER CHECK:** Are there any animals (e.g., chicken, pigeons, goat) which are kept inside the house or regularly enter the house? **SELECT ALL THAT APPLIES OR ONLY 'NO'**	Yes, chickens, and other poultry are present .. A Yes, livestock is present ..... B Yes, rabbits are present..... C Yes, mice and rats are present ..... D Yes, faeces of animals can be observed ..... E No..... Y	

4. HOUSEHOLD ASSETS

RESPONDENT: HOUSEHOLD HEAD OR MAIN FARMER IN THE HOUSEHOLD

READ: I would like to ask you questions on the workable assets belonging to the household members.

Respondent's name and IDP
_____ IDP [___|___]
Name

LIST ALL ASSETS		
ASSET CATEGORY	CODE	**1** In your household does anyone own [ASSET] in working condition? 1 - Yes 0 - No → **NEXT ASSET**
ASSETS	CODE	CODE
Household assets		
Car / truck / minibus	01	1 0
Motorcylce / motor scooter	02	1 0
Motor Tricycle	03	1 0
Bicycle	04	1 0
Refrigerator	05	1 0
Freezer	06	1 0
Stove (electric / gas) /Cooker	07	1 0
Oven (electric / gas) **(IF STOVE HAS OVEN, THEN HOUSEHOLD IS CONSIDERED OWN OVEN)**	08	1 0
Electric dish washer	09	1 0
Full-automatic washing machine	10	1 0
Half-automatic washing machine	11	1 0
Manual washing machine	12	1 0
Water heater (electric / gas / fuel)	13	1 0
Air conditioner	14	1 0
Electric fan	15	1 0
Landline telephone	16	1 0
Smartphone (i.e. phone on which internet can be accessed)	17	1 0
Normal (analog) mobile phone	18	1 0
Computer (laptop, PC, tablet, etc.)	19	1 0
Internet connection	20	1 0

4. HOUSEHOLD ASSETS

LIST ALL ASSETS		
ASSET CATEGORY	CODE	**1** In your household does anyone own [ASSET] in working condition? 1 - Yes 0 - No → **NEXT ASSET**
ASSETS	CODE	CODE
Television	21	1 0
Satellite dish	22	1 0
Radio/casette player	24	1 0
Bed	25	1 0
Matress	26	1 0
Sofa / armchair	27	1 0
Chair	28	1 0
Table / desk	29	1 0
Tablia (very low round table)	30	1 0
Zeer / kolla (container for storing / offering water)	31	1 0
Private wrist / pocket watch	32	1 0
Gold/ jewelry	33	1 0
Extra real estate (apart from where you are living)	34	1 0
Microwave	35	1 0

5. INCOME SOURCES AND SOCIAL PROTECTION

RESPONDENT: HOUSEHOLD HEAD OR ANY WELL-INFORMED MEMBER ABOVE AGE 18

READ: I would like to ask you questions about income transfers and other cash assistance that your household received **in the past 12 months (EXPLAIN)**.

Respondent's name and IDP
_____ IDP [___|___]
Name

DONOR LIST		1 **In the past 12 months**, did you or any other household member receive income transfers or other cash assistance from [DONOR]? 1 - Yes 0 - No → **NEXT DONOR**	2 **In the past 12 months**, how much money did you and any other household member receive in total from [DONOR]? **IF DOES NOT KNOW RECORD "9999998"**
DONOR	CODE	CODE	EGP
Any remittances (Family members or friends living in Egypt (outside household)/ or outside Egypt)	01	1 0	[__|__|__|__|__|__|__]
Government pension or social programs	02	1 0	[__|__|__|__|__|__|__]
Religiously motivated support (incl. Zakat, Sadaqah, donation from church)	03	1 0	[__|__|__|__|__|__|__]
Support from NGO'S	04	1 0	[__|__|__|__|__|__|__]
Other **(SPECIFY)**	97	1 0	[__|__|__|__|__|__|__]

READ: I would like to ask you questions about your households' participation in the food subsidy program.

5. INCOME SOURCES AND SOCIAL PROTECTION

Respondent's name and IDP _____ IDP [___|___] Name		
3	Do you or any other household member have a family ration supply card (Smart Card)?	1 - Yes 0 - No→ **Q6**
4	How many people are registered on the family ration supply card?	**PERSONS** [__|__] **IF DOES NOT KNOW RECORD "98"**

READ: I would like to ask you questions about past and current agricultural development and community health projects that your household participated in, **during the past ten years (EXPLAIN).**

6	In the past 10 years, did you or any member of your family participate in any development project?	Yes……....1 No…… …..0 Does not know 8	→ **NEXT SECTION** → **NEXT SECTION**
7	Are you or any member of your family participating now in a development project?	Yes……....1 No…… …..0 Does not know……8	
8	Can you please name the project(s) you are participating/ participated in?	PROJECT [___|___] **(LIST E)**	

5. INCOME SOURCES AND SOCIAL PROTECTION

LIST E

CODE	PROJECT
A	FAS PROJECT FUNDED BY USAID [FOOD SECURITY AND AGRIBUSINESS SUPPORT PROJECT, IMPLEMENTED BY CULTURING NEW FRONTIERS IN AGRICULTURE (CNFA), FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT, 2015 - PRESENT]
B	AMAL PROJECT FUNDED BY USAID [ADVANCED MARKETING AND AGRIBUSINESS LOGISTICS PROJECT, IMPLEMENTED BY ACDI/VOCA AND FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT, 2015 - PRESENT]
C	PREMIUM PROJECT FUNDED BY USAID [PREMIUM PROJECT FOR EGYPTIAN SMALL GROWERS, IMPLEMENTED BY BLUE MOON AND FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT, 2011 - PRESENT]
D	AGRIBUSINESS PROJECT WITH HEINZ COMPANY FUNDED BY USAID [AGRIBUSINESS LINKAGES - GLOBAL DEVELOPMENT ALLIANCE PROJECT, IMPLEMENTED BY ACDI/VOCA WITH HEINZ COMPANY AND FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT, 2008 - 2013]
E	SAIL PROJECT FUNDED BY IFAD [SUSTAINABLE AGRICULTURE INVESTMENTS AND LIVELIHOODS PROJECT, FUNDED BY THE INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT, 2014 - PRESENT]
F	PRIME PROJECT FUNDED BY IFAD [PROMOTION OF RURAL INCOMES THROUGH MARKET ENHANCEMENT PROJECT, FUNDED BY INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT, 2013 - PRESENT]
G	OFIDO PROJECT FUNDED BY IFAD [ON-FARM IRRIGATION DEVELOPMENT IN THE OLDLANDS PROJECT, FUNDED BY INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT, 2009 - 2017]
H	RURAL DEVELOPMENT PROJECT FUNDED BY IFAD [UPPER EGYPT RURAL DEVELOPMENT PROJECT, FUNDED BY THE INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT, 2006 - 2016]
I	ENID PROJECT FUNDED BY UNDP [EGYPT NETWORK FOR INTEGRATED DEVELOPMENT PROJECT, FUNDED BY THE UNITED NATIONS DEVELOPMENT PROGRAMME, 2012 - PRESENT]
J	SMART PROJECT FUNDED BY USAID [COMMUNITY-BASED INITIATIVES FOR A BETTER LIFE PROJECT, FUNDED BY THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT, 2011 - 2014]
K	OTHER PROJECT DURING THE PAST 10 YEARS **(SPECIFY)**
L	OTHER PROJECT DURING THE PAST 10 YEARS **(SPECIFY)**
M	OTHER PROJECT DURING THE PAST 10 YEARS **(SPECIFY)**

6. HOUSEHOLD FOOD CONSUMPTION AND EXPENDITURE

[NAME, (food shopper)] _____ IDP [__|__]	[NAME, (meal preparer)] _____ IDP [__|__]

RESPONDENT: MEAL PREPARER AND FOOD PURCHASER

I would like to ask you some questions on food consumption in your household **during the past 7 days (EXPLAIN).** I would like to ask you about all food items that all members of your household ate or purchased.

1	**In the past 7 days**, how many persons usually consumed food in your household on a given day?	**Men** [__|__] **Women** [__|__] **Children** [__|__]
2	**In the past 7 days,** have other people, such as neighbors or family members not belonging to your household eaten with your family at meal times or taken food at your house?	1 - Yes 0 - No → **Q5**
3	**In the past 7 days,** how many other people have shared at least one meal with your household?	PERSONS [__|__]
4	**In the past 7 days,** how many meals did those persons eat with your household? **IF 95 OR MORE RECORD "95"**	TOTAL MEALS [__|__] **IF DOES NOT KNOW RECORD "98"**

6. HOUSEHOLD FOOD CONSUMPTION AND EXPENDITURE

FOOD		5	6	7	8	9	10	11	12
		In the past 7 days, have any member of your household consumed or purchased [FOOD ITEM]?	You said that your household have consumed or purchased (item) **in the past 7 days**, how much [FOOD ITEM] was consumed by the members of your household?		**In the past 7 days**, how much [FOOD ITEM] did your household consume from your own farm production?		**In the past 7 days**, how much [FOOD ITEM] did your household purchase?		**In the past 7 days**, What was the total amount spent on [FOOD ITEM]?
		1 - Yes 0 - No →**NEXT ITEM**	Quantity **IF DOES NOT KNOW RECORD "9999.998" →Q8**	Unit (**LIST F**)	Quantity **IF DOES NOT KNOW RECORD "9999.998"→Q10**	Unit (**LIST F**)	Quantity **IF DOES NOT KNOW RECORD "9999.998"→Q12**	Unit (**LIST F**)	Amount **IF DOES NOT KNOW RECORD "99999.98"**
ITEM	CODE	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	EGP
Cereals & cereal products									
Local rice – subsidized	0101	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Local rice – non-subsidized	0102	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Imported rice (e.g. Basmati)	0103	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Flour – subsidized	0104	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Flour – non-subsidized	0105	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Baladi bread – subsidized	0106	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Pita bread – non-subsidized	0107	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Grits/Groats	0108	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Pasta – subsidized	0109	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Pasta – non-subsidized	0110	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other cereals & cereal products **(SPECIFY)**	0111	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Roots & tubers									
Potatoes	0201	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Sweet potatoes (orange flesh)	0202	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Taro roots	0203	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other roots & tubers **(SPECIFY)**	0204	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]

6. HOUSEHOLD FOOD CONSUMPTION AND EXPENDITURE

Pulses & nuts										
Beans	0301	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Lentils	0302	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other pulses & nuts **(SPECIFY)**	0303	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Vegetables										
Tomatoes	0401	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Okra	0402	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Bell peppers (green & red)	0403	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Eggplants	0404	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Zucchinis	0405	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Green beans	0406	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Peas	0407	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Cucumbers	0408	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Carrots	0409	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Onions	0410	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Garlic	0411	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Cabbage	0412	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Cauliflower	0413	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Molokhia	0414	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Spinach / chard	0415	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other vegetables **(SPECIFY)**	0416	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Fruits										
Apples	0501	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Oranges / mandarins	0502	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Lemons / limes	0503	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Strawberry	0504	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]

6. HOUSEHOLD FOOD CONSUMPTION AND EXPENDITURE

Peaches / nectarines	0505	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Bananas	0506	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Cantaloupes	0507	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Watermelons	0508	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Grapes	0509	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Guava	٠٥١٠	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Pomegranate	051١	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other fruits **(SPECIFY)**	051٢	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Meat										
Beef / veal	0601	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Mutton / goat meat	0602	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Chicken	0603	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Pigeons, ducks, geese	0604	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Liver & giblets (from livestock & poultry)	0605	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other meats **(SPECIFY)**	0606	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Fish										
Fresh fish (e.g. *Tilapia*, *…)*	0701	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other fish & seafood **(SPECIFY)**	0702	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Eggs, milk & dairy products										
Eggs	0801	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Milk	0802	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Laban Rayeb / Yoghurt	0803	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
White cheese (e.g. *Domiati*, *Feta*, cottage cheese)	0804	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]

6. HOUSEHOLD FOOD CONSUMPTION AND EXPENDITURE

Salty & yellow cheese (e.g. *Roumy*, *Gouda*)	0805	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other milk & dairy products **(SPECIFY)**	0806	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Oils & fats										
Cooking oil - subsidized	0901	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Cooking oil - non-subsidized	0902	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Vegetable shortening / margarine	0903	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Ghee (made from butter)	0904	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Butter	0905	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other oils & fats **(SPECIFY)**	0906	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Sugars										
Sugar - subsidized	1001	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Sugar - non-subsidized	1002	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Honey	1003	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Molasses	1004	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other sugars & sweeteners **(SPECIFY)**	1005	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Condiments										
Salt	1101	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Spices & herbs	1102	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other condiments (e.g. sauces, vinegar, soup cubes) **(SPECIFY)**	1103	1 0							[__|__|__|__|__] , [__|__]	
Sweets & snacks										
Sweets (e.g. *Halawa*, candy, chocolate)	1201	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]	

6. HOUSEHOLD FOOD CONSUMPTION AND EXPENDITURE

Sugary snacks (e.g. biscuits, ….etc)	1202	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Salty snacks (e.g. potato chips, *Cheetos*)	1203	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other sweets & snacks **(SPECIFY)**	1204	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Beverages									
Black tea	1301	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Soft drinks (e.g. *Cola*, *Fanta*)	1302	1 0	[__|__|__|__] , [__|__|__]	[__|__]			[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Fruit juices & concentrate drinks	1303	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]
Other beverages **(SPECIFY)**	1304	1 0	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__] , [__|__|__]	[__|__]	[__|__|__|__|__] , [__|__]

LIST F: UNIT CODES

11 = KILOGRAM	28 = BOTTLE, MEDIUM (500 ML)
12 = GRAM	29 = BOTTLE, LARGE (750 ML)
13 = LITER	30 = BOTTLE, EXTRA-LARGE (1.5 L)
14 = MILLILITER	31 = TEASPOON
15 = BREAD LOAF, SMALL	32 = TABLESPOON
16 = BREAD LOAF, MEDIUM (BALADI)	33 = LARGE SAC
17 = BREAD LOAF, LARGE	34 = SMALL SAC
18 = PIECE, SMALL	35 = PORTION, SMALL (250 G)
19 = PIECE, MEDIUM	36 = PORTION, MEDIUM (400 G)
20 = PIECE, LARGE	37 = PORTION, LARGE (450 G)
21 = CUP, SMALL (100 ML)	38 = One
22 = CUP, MEDIUM (200 ML)	39 = Tie/pack
23 = CUP, LARGE / MUG (330 ML)	96 = OTHER **(SPECIFY)**
24 = CAN, SMALL (200 ML / 150 G)	
25 = CAN, MEDIUM (330 ML / 400 G)	
26 = CAN, LARGE (1 L / 800 G)	
27 = BOTTLE, SMALL (330 ML)	

7. OUTSIDE-HOME FOOD EXPENDITURE

RESPONDENT: MEAL PREPARER AND FOOD PURCHASER

READ: I would like to ask you some questions about the consumption of food, drinks and smoke outside home for all household members **in the past 7 days (EXPLAIN).**

Respondent's name and IDP
_____ IDP [___|___]
Name

		1	2
FOOD		**In the past 7 days**, have any member of your household consumed or purchased [FOOD ITEM] outside home?	**In the past 7 days**, how much did your household spent on [FOOD ITEM] overall?
		1 - Yes 0 - No →**NEXT ITEM**	Amount **IF DOES NOT KNOW RECORD "99999.98"**
ITEM	CODE	CODE	EGP
Meals eaten in restaurants	01	1 0	[__|__|__|__|__] , [__|__]
Snacks and drinks purchased at kiosks / shops / street vendors (including for school/university)	02	1 0	[__|__|__|__|__] , [__|__]
Tea and shisha in tea / shisha places or at street vendors	03	1 0	[__|__|__|__|__] , [__|__]
Other **(SPECIFY)**	07	1 0	[__|__|__|__|__] , [__|__]

8. MONTHLY NON-FOOD EXPENDITURES

INTERVIEWER: Please enter code of interviewer for this section **CODE** [___|___]
RESPONDENT: HOUSEHOLD HEAD OR MAIN FARMER

READ: I would like to ask you questions on non-food expenses for all household members during **the past four weeks (EXPLAIN).**

Respondent's name and IDP
_____ IDP [___|___]
Name

LIST ALL ITEMS

		1	2
EXPENSE	CODE	**During the past four weeks,** did your household purchase [EXPENSE ITEM]? 1 - Yes 0 – No→**NEXT ITEM** **IF HOUSEHOLD ACQUIRED ITEM ON CREDIT/LOAN OR IN INSTALMENTS RECORD "YES" AND RECORD THE VALUE IN Q2**	**During the past four weeks,** How much did your household spend in total to purchase [ITEM]? **IF DOES NOT KNOW RECORD "999999.98"**
ITEM	CODE	CODE	EGP
Smoking			
Cigarettes and tobacco	0101	1 0	[__|__|__|__|__|__],[__|__]
Rent, Utilities, and Energy			
Rent **SKIP TO NEXT ITEM IF HOUSEHOLD IS NOT RENTED (SEE IF CODE IN Q7,SECTION 3, IS DIFFERENT FROM 3)**	0201	1 0	[__|__|__|__|__|__],[__|__]
Electricity bill	0202	1 0	[__|__|__|__|__|__],[__|__]
Water bill	0203	1 0	[__|__|__|__|__|__],[__|__]
Gas, diesel and kerosene	0204	1 0	[__|__|__|__|__|__],[__|__]
Trash collection	0205	1 0	[__|__|__|__|__|__],[__|__]
Other **(SPECIFY)**	0206	1 0	[__|__|__|__|__|__],[__|__]
Transportation			
Transportation (Bus / minibus, taxi, Tuk-tuk, etc.)	0301	1 0	[__|__|__|__|__|__],[__|__]
Transportation to school (for children)	0302	1 0	[__|__|__|__|__|__],[__|__]
Other **(SPECIFY)**	0303	1 0	[__|__|__|__|__|__],[__|__]
Communication, information, entertainment			
Mobile phone credit / bill	0401	1 0	[__|__|__|__|__|__],[__|__]

8. MONTHLY NON-FOOD EXPENDITURES

Landline phone bill	0402	1	0	[__|__|__|__|__|__],[__|__]
TV satellite service	0403	1	0	[__|__|__|__|__|__],[__|__]
Internet service	0404	1	0	[__|__|__|__|__|__],[__|__]
Other **(SPECIFY)**	0405	1	0	[__|__|__|__|__|__],[__|__]
Hygiene and cleaning				
Hygiene products (e.g. body soap, shampoo, toothpaste) and cosmetis (e.g. deodorant, make-up, shaving cream)	0501	1	0	[__|__|__|__|__|__],[__|__]
Toilet paper / tissues / cotton / etc.	0502	1	0	[__|__|__|__|__|__],[__|__]
Cost of barbar / hairdresser service	0503	1	0	[__|__|__|__|__|__],[__|__]
Sanitry napkins and diapers	0504	1	0	[__|__|__|__|__|__],[__|__]
Detergents, bleach and cleaning supplied	0505	1	0	[__|__|__|__|__|__],[__|__]
Other **(SPECIFY)**	0506	1	0	[__|__|__|__|__|__],[__|__]

9. YEARLY NON-FOOD EXPENDITURES

RESPONDENT: HOUSEHOLD HEAD OR MAIN FARMER

READ: I would like to ask you questions on non-food related expenses for all household members during **the past 12 months (EXPLAIN).**

Respondent's name and IDP
_____ IDP [___|___]
Name

LIST ALL ITEMS

		1	2
Expense	CODE	During **the past 12 months,** did your household purchase/ expense [ITEM]? 1 - Yes 0 - No →**NEXT ITEM** **IF HOUSEHOLD ACQUIRED ITEM ON CREDIT/LOAN OR IN INSTALMENTS RECORD "YES" AND RECORD THE VALUE IN Q2**	During **the past 12 months,** How much did your household spend in total to purchase [EXPENSE ITEM]? **IF DOES NOT KNOW RECORD "999998"**
ITEM	CODE	CODE	EGP
Clothing			
Children's clothes and shoes	0101	1 0	[__|__|__|__|__|__]
Men's clothes and shoes	0102	1 0	[__|__|__|__|__|__]
Women's clothes and shoes	0103	1 0	[__|__|__|__|__|__]
Cost of making / repairing clothes / shoes	0104	1 0	[__|__|__|__|__|__]
Other **(SPECIFY)**	0105	1 0	[__|__|__|__|__|__]
Lodging			
Bedding and furnitures (beds, chairs, tables, etc.)	0201	1 0	[__|__|__|__|__|__]
Kitchen utensils and tableware (pots, plates, cuttlery, etc.)	0202	1 0	[__|__|__|__|__|__]
House construction material (cement, bricks, doors, windows, etc.)	0203	1 0	[__|__|__|__|__|__]
Cost of construction / building repair services	0204	1 0	[__|__|__|__|__|__]
Other **(SPECIFY)**	0205	1 0	[__|__|__|__|__|__]
Other durable goods and repair services			
Vehicles (car, motorbike, bicycle, etc.)	0301	1 0	[__|__|__|__|__|__]
Cost for vehicle repair	0302	1 0	[__|__|__|__|__|__]
Communication devices (mobile phone, computer, etc.)	0303	1 0	[__|__|__|__|__|__]
TV / radio	0304	1 0	[__|__|__|__|__|__]

9. YEARLY NON-FOOD EXPENDITURES

Respondent's name and IDP
_____ IDP [___|___]
Name

LIST ALL ITEMS

		1	2
Expense	CODE	During **the past 12 months,** did your household purchase/ expense [ITEM]? 1 - Yes 0 - No →**NEXT ITEM** **IF HOUSEHOLD ACQUIRED ITEM ON CREDIT/LOAN OR IN INSTALMENTS RECORD "YES" AND RECORD THE VALUE IN Q2**	During **the past 12 months,** How much did your household spend in total to purchase [EXPENSE ITEM]? **IF DOES NOT KNOW RECORD "999998"**
ITEM	CODE	CODE	EGP
Electrical household appliances (refrigerator, stove, dish washer, etc.)	0305	1 0	[__|__|__|__|__|__]
Cost for repairing electronics	0306	1 0	[__|__|__|__|__|__]
Other durables **(SPECIFY)**	0307	1 0	[__|__|__|__|__|__]
Other repair costs for durables **(SPECIFY)**	0308	1 0	[__|__|__|__|__|__]
Personal effects			
Watch	0401	1 0	[__|__|__|__|__|__]
Jewelry	0402	1 0	[__|__|__|__|__|__]
Hand bags / suitcase / belt / wallet	0403	1 0	[__|__|__|__|__|__]
Cost for repairing personal effects goods	0404	1 0	[__|__|__|__|__|__]
Other personal effects **(SPECIFY)**	0405	1 0	[__|__|__|__|__|__]
Social events			
Dowry	0501	1 0	[__|__|__|__|__|__]
Weddings / engagements	0502	1 0	[__|__|__|__|__|__]
Funerals	0503	1 0	[__|__|__|__|__|__]
Other events **(SPECIFY)**	0504	1 0	[__|__|__|__|__|__]
School / university expenses			
Tuition fees and private tutoring / school group tutoring	0601	1 0	[__|__|__|__|__|__]
Uniform	0602	1 0	[__|__|__|__|__|__]
Books	0603	1 0	[__|__|__|__|__|__]
School supplies (pens, notebooks, etc.)	0604	1 0	[__|__|__|__|__|__]

9. YEARLY NON-FOOD EXPENDITURES

Respondent's name and IDP
_____ IDP [___|___]
Name

LIST ALL ITEMS

		1	2
Expense	CODE	During **the past 12 months,** did your household purchase/ expense [ITEM]? 1 - Yes 0 - No →**NEXT ITEM** **IF HOUSEHOLD ACQUIRED ITEM ON CREDIT/LOAN OR IN INSTALMENTS RECORD "YES" AND RECORD THE VALUE IN Q2**	During **the past 12 months,** How much did your household spend in total to purchase [EXPENSE ITEM]? **IF DOES NOT KNOW RECORD "999998"**
ITEM	CODE	CODE	EGP
Other **(SPECIFY)**	0605	1 0	[__|__|__|__|__|__]
Medical expenses			
Medicine	0701	1 0	[__|__|__|__|__|__]
Pharmaceutic products (bandage, contraception methods, etc.)	0702	1 0	[__|__|__|__|__|__]
Public hospital / clinic service	0703	1 0	[__|__|__|__|__|__]
Private hospital / clinic service	0704	1 0	[__|__|__|__|__|__]
Community health center service	0705	1 0	[__|__|__|__|__|__]
Other medical products **(SPECIFY)**	0706	1 0	[__|__|__|__|__|__]
Other medical service costs **(SPECIFY)**	0707	1 0	[__|__|__|__|__|__]

Is woman present to complete woman questionnaire with her?

Yes……....1
No…….
..... …..0

10. AGRICULTURAL ASSETS AND LIVESTOCK

RESPONDENT: MAIN FARMER OR PERSON MOST RESPONSIBLE FOR FARMING AND AGRICULTURE

READ: First, I would like to ask you some questions about the agricultural assets that your household owns or share with other households and that are in working condition

Respondent's name and IDP
_____ IDP [___|___]
Name

1		2	3	4
ASSET		Does your household own or share [ASSET] in working condition? 1 - Yes→ **NEXT ASSET** 0 - No	Do you have access to [ASSET] when you need it? 0- No → **NEXT ASSET** 1- Yes, free of charge 2- Yes, paying a rent 3 - Not needed→**NEXT ASSET** 8 - Don't know	Who lends you [ASSET]? 1- Farmer association 2 – Agricultural cooperative 3 – Family member (living in another household) 4 – Neighbor or friend 5 – Private lender 6- Other (**SPECIFY)** 8- Don't Know
ITEM	CODE	CODE	CODE	CODE
Tractor	1	0 1	0 1 2 3 8	1 2 3 4 5 6 8
Hand sprayer	2	0 1	0 1 2 3 8	1 2 3 4 5 6 8
Water pump (fuel operated)/Irrigation machine	3	0 1	0 1 2 3 8	1 2 3 4 5 6 8
Drip irrigation equipment	4	0 1	0 1 2 3 8	1 2 3 4 5 6 8
Other assets **(SPECIFY)**	6	0 1		

READ: Now, I would like to ask you some questions about all livestock that your household owns or shares, including male and female adult and young animals, and including animals which this household owns, shares or takes care of them for other person.

10. AGRICULTURAL ASSETS AND LIVESTOCK

5		6		7	8
LIVESTOCK CATEGORY		Does your household own or raise [ANIMAL]? 1- Yes 0- No →**SKIP TO NEXT [ANIMAL]**		How many [ANIMALS] does your household own? **IF DON'T KNOW RECORD "98"** **IF 95 OR MORE RECORD "95"**	How many (animal) does your household raise by sharing or for another household? **IF DON'T KNOW RECORD "98"** **IF 95 OR MORE RECORD "95"**
ITEM	CODE	CODE		QUANTITY	QUANTITY
Goats	01	0	1	[__|__]	[__|__]
Sheep	02	0	1	[__|__]	[__|__]
Cattle	03	0	1	[__|__]	[__|__]
Donkeys / mulls	04	0	1	[__|__]	[__|__]
Horses	05	0	1	[__|__]	[__|__]
Camels	06	0	1	[__|__]	[__|__]
Chicken/Duck/Pigeon …..etc	07	0	1	[__|__]	[__|__]
Other livestock **(SPECIFY)**	96	0	1	[__|__]	[__|__]

11. FARM LAND (Summer season)

	Have you cultivated any crops during summer 2017?	Yes.. ..... 1 No……...0	→**Winter season**

READ: Now, I would like to ask you about all the agricultural land that was cultivated or owned by your household **during the last summer season**. (**EXPLAIN:** the last summer season is the summer season in 2017). Please tell me about ALL land cultivated by this household, regardless of whether the land is owned by your household or not.

1	How much agricultural land in total did your household cultivate whether owned or rented **during the last summer season**? **Recode the area duplicated if he cultivate a harvested crop an then cultivated another crop in the same land**	FEDDAN	KIRAT	Sahm
		[__|__]	[__|__]	[__|__]
2	Did your household have any agricultural land as fallow land during the last summer season?	Yes.. ..... 1 No……...0→**Q3a**		
3	How much agricultural land had your household, as fallow land, **during the last summer season**?	FEDDAN	KIRAT	Sahm
		[__|__]	[__|__]	[__|__]
3a	How much did your household harvest from the agricultural land **during the last summer season**? **Recode the area duplicated if he cultivate a harvested crop an then cultivated another crop in the same land**	FEDDAN	KIRAT	Sahm
		[__|__]	[__|__]	[__|__]
4	How many fields did your household harvested or cultivated **during the last summer seasons**? **(EXPLAIN: A FIELD IS A CONTINOUS PIECE OF LAND MANAGED BY THE SAME HOUSEHOLD FOR AGRICULTURAL PURPOSES)**	NUMBER		
		[__|__]		

11. FARM LAND (Summer season)

	5	6			7	8	9	10	11
FIELD	Where was Field [FIELD] located? 1- Old lands (Nile valley) 2- New lands (dessert) 8- Don't know	What was the land size of Field [FIELD]?			Was the Field [FIELD] owned by your household, rented, or borrowed? 1- Owned →**Q10** 2- Rented, for a rent 3- Rented, under a sharecropping agreement →**Q9** 4-Part rented, part under sharecropping agreement 5- Borrowed, for free →**Q10** 96 -Other **(SPECIFY)**	How much rent did your household pay for the total?	Which percent share of the crops did your household hand over to the owner of Field [FIELD]? **RECORD "98" IF FARMER DOES NOT KNOW** **SKIP THIS QUESTION IF Q7==2**	Did your household hire any machinery service for preparing Field [FIELD] for cultivation (for example, ploughing, leveling, contouring irrigation furrows)? 1- Yes 0- No → **Q12**	How much did your household pay for the preparation of Field [FIELD]?
	CODE	FEDDAN	KIRAT	Sahm	CODE	EGP	%	CODE	EGP
1	1 2 8	[__|__]	[__|__]	[__|__]	1 2 3 4 5 96	[__|__|__|__|__]	[__|__]	1 0	[__|__|__|__|__]
2	1 2 8	[__|__]	[__|__]	[__|__]	1 2 3 4 5 96	[__|__|__|__|__]	[__|__]	1 0	[__|__|__|__|__]
ONE ROW FOR EACH FIELD REPORTED IN QUESTION 4. MAXIMUM 20 ROWS									

11. FARM LAND (Summer season)

	12	13	14
FIELD	How did you irrigate Field [FIELD]? 1-By flooding areas or furrows in the field 2-Through a sprinkler system 3-Through a drip irrigation system 96 -Other **(SPECIFY)** 98- Don't know	Where did the water for irrigating Field [FIELD] come from? 1-Irrigation canal / river 2- Sewage canal / pipe 3- Borehole / well 96- Other **(SPECIFY)** 98- Don't know	During the planting period, how often was the water for irrigating Field [FIELD] available? 1-All day (and Night) 2-At least twice per day 3-Once per day 4-Every 2nd day 5- At least every 5th day (but more than every 2nd day) 6-At least every 10th day (but more than every 5th day) 96-Other frequency **(SPECIFY)** 98-Doesn't know
	CODE	CODE	CODE
1	1 2 3 96 98	1 2 3 96 98	1 2 3 4 5 6 96 98
2	1 2 3 96 98	1 2 3 96 98	1 2 3 4 5 6 96 98
ONE ROW FOR EACH FIELD REPORTED IN QUESTION 4. MAXIMUM 20 ROWS			

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

READ: Now, I would like to ask you about ALL crops on EACH field that your household **harvested during the last summer season**. (**EXPLAIN:** the last summer harvest season was in autumn 2017)**.**

		1	28	29				2			4
FIELD	PRIMARY CROP	Which was/were the primary crop(s) that your household cultivated in Field [FIELD]? **(EXPLAIN: IF YOU PRACTICED INTERCROPPING IN A PART OF THE FIELD, THE PRIMARY CROP IS THE DOMINANT CROP DURING THE SUMMER SEASON IN THIS PART OF THE FIELD.)** Please tell me all primary crops. → Any other primary crop? **CROP (LIST G)** **RECORD CROPS BY FIELD. SELECT CROPS FROM LIST G. IF CROP IS NOT IN LIST G, USE "OTHER (SPECIFY) OPTION" TO RECORD CROP**	Were there any secondary crops planted in between the [PRIMARY CROP] at the same time or on the edges of Field [FIELD]? Or, are there any fruit trees or date palms on Field [FIELD]? 1-Yes 0-No →**Q2**	Which was/were the secondary crop(s) that your household cultivated in Field [FIELD]? **IF NONE, RECORDE "0"** **ONE COLUMN FOR EACH SECONDARY CROP. MAXIMUM 7 COLUMNS**			Is there another crop in Field [FIELD] ? 1-Yes 0-No	How many feddans or kirats of Field [FIELD] was planted with [PRIMARY CROP]? **CHECK: IS TOTAL LAND SIZE FOR ALL CROPS IN FIELD EQUAL TO REPORTED SIZE IN Q6 IN MODULE 11?**			In which month was [PRIMARY CROP] planted? **MONTH (LIST H)**
		CODE	CODE	CROP 1	CROP 2	ADD COLUMN	CODE	F	K	S	MONTH
1	1	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	2	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										
2	1	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	2	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		5		5a	6	7	8	9	10
FIELD	PRIMARY CROP	In which month of which year was [PRIMARY CROP] planted? **MONTH (LIST H)** **ONLY FOR PERENNIAL CROPS** PERENNIAL CROPS means: trees like orange, palm, lemon, grapes)		Do you have a FAS contract with a buyer for producing [CROP]? 1 Yes, FAS signed contract (individual or through association/cooperative) 2 Yes, committed FAS contract (individual or through association/cooperative) 3 Yes, but not through FAS 4 No	In how many batches was [PRIMARY CROP] harvested? **IF CROP WAS HARVESTED IN MORE THAN ONE BATCH SKIP TO Q8 (EXPLAIN: HARVESTING IN SEVERAL BATCHES MEANS THAT A CROP WAS HARVESTED AT DIFFERENT POINTS IN TIME)**	**In last summer season,** In which month was [PRIMARY CROP] harvested? **MONTH (LIST H)** **SKIP TO Q10**	**In last summer season** When was the first batch of [PRIMARY CROP] harvested? **MONTH (LIST H)**	**In last summer season** When was the last batch of [PRIMARY CROP] harvested? **MONTH (LIST H)**	Did your household hire agricultural workers or agricultural machinery services to help with planting, weeding, spraying, or harvesting of [PRIMARY CROP]? 1-Yes 0-No→**Q13**
		MONTH	YEAR	CODE	TIMES	MONTH	MONTH	MONTH	CODE
1	1	[__|__]	[__|__|__|__]	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	1 0
	2	[__|__]	[__|__|__|__]	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	1 0
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS								
2	1	[__|__]	[__|__|__|__]	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	1 0
	2	[__|__]	[__|__|__|__]	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	1 0
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS								

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		11	12		13		14		15		16	16a
FIELD	PRIMARY CROP	How many workers and machinery operators did your household hire for [PRIMARY CROP]?	How many days and hours **in total** did Worker / Operator [WORKER] work on [PRIMARY CROP]? **RECORD NUMBER OF DAYS AND HOURS SPENT BY EACH WORKER IN EACH CROPS.**		How much [PRIMARY CROP] did your household harvest **in total**? **LIST K**		How much of the total harvest of [PRIMARY CROP] did your household keep for own consumption? **LIST K** **RECORD "00000.00" IF NONE**		How much of the total harvest of [PRIMARY CROP] did your household sell? **LIST K** **RECORD "00000.00" IF NONE AND SKIP TO Q24**		Did your household sell the entire harvest of [PRIMARY CROP] all at once or in several batches? 1-All at once 2-In several batches **(EXPLAIN: SELLING IN SEVERAL BATCHES MEANS THAT THE TOTAL QUANTITY HARVESTED WAS SOLD TO SEVERAL DIFFERENT BUYERS/TRADERS OR TO THE SAME BUYER/TRADER AT DIFFERENT POINTS IN TIME AND AT DIFFERENT PRICES)**	**If Q.5a = 1 or 2,** Who was the buyer of [CROP]? 1-Single buyer / trader with whom your household had forward contract 2- Single buyer / trader, without forward contract 3- Several buyers in a wholesale market 4- Consumers in a local market 6- Other (**SPECIFY**) 8- Doesn't know
		NUMBER	DAYS	HOURS	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	CODE
1	1	[_|_]	[_|_]	[_|_]	[__|__]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	2	[_|_]	[_|_]	[_|_]	[__|__]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[_|_]	[_|_]	[_|_]	[__|__]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	2	[_|_]	[_|_]	[_|_]	[__|__]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	[_|_]	[_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		17	18									
Field ID	PRIMARY CROP	**If Q.16 was all at once, skip to 18a.** In how many batches did your household sell the harvest of [PRIMARY CROP]?	How much [PRIMARY CROP] did your household sell each time? **RECORD QUANTITY SOLD FOR EACH BATCH REPORTED IN Q17.** **ONE COLUMN FOR EACH BATCH REPORTED IN Q17.** **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS** **(LIST K)**									
		NUMBER	BATCH 1		BATCH 2		BATCH 3		BATCH 4		ADD COLUMN	
			CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
	2	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										
2	1	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
	2	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		18a					19				
Field ID	PRIMARY CROP	Have you experienced any troubles with the buyer in terms of getting back your money for the delivered harvest? 1 Yes, I did not get back any money 2 Yes, but not one time/delays 3 Yes, OTHER_SPECIFY 4 NO **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS**					In which month did your household sell the harvest of [PRIMARY CROP]? **MONTH (LIST H)** **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS**				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN	BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		CODE	CODE	CODE	CODE	CODE	MONTH	MONTH	MONTH	MONTH	MONTH
1	1	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	[___|___]
	2	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	[___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										
2	1	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	[___|___]
	2	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	[___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		20				
Field ID	PRIMARY CROP	What was the total amount that your household received for the total quantity [QUANTITY] of [PRIMARY CROP] sold? **RECORD VALUE FOR EACH BATCH REPORTED IN Q17.** **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS**				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		EGP	EGP	EGP	EGP	EGP
1	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					
2	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		21					22				
Field ID	PRIMARY CROP	Who purchased the harvest of [PRIMARY CROP]? 1-Single buyer / trader with whom your household had forward contract 2- Single buyer / trader, without forward contract 3- Several buyers in a wholesale market→**Q24** 4- Consumers in a local market→ **Q24** 96- Other (**SPECIFY**) → **Q24** 98- Doesn't know→ **Q24** **READ ALL OPTIONS**					Did the buyer/trader pick up the harvest of [PRIMARY CROP] from your field or your farm? 1-Yes →**Q24** 0-No				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN	BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		CODE	CODE	CODE	CODE	CODE	CODE	CODE	CODE	CODE	CODE
1	1	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
	2	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS									
2	1	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
	2	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS									

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		23				
Field ID	PRIMARY CROP	What were the total costs for transporting the harvest of [PRIMARY CROP] to the point of sale (for example, for fuel or hiring transportation)?				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		EGP	EGP	EGP	EGP	EGP
1	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					
2	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		24	25											
FIELD	PRIMARY CROP	Which fertilizer(s) did your household apply to [PRIMARY CROP]? **FERTILIZER (LIST I)**	How much chemical and organic fertilizers [FERTILIZER] did your household apply to [PRIMARY CROP]? 1-Shikara, small (15 kg) 2-Shikara, medium (25 kg) 3-Shikara large (50 kg) 4-Kilogram (kg) 5-Gram (g) 6-Baraweta (manure) 50KG 7- Baraweta (birds manure) 30KG 8- Caro (manure) 500 KG 9- Caro (birds manure) 300KG 10- Small truck (manure) 1.5 Ton 11- Small truck (birds manure) 1 Ton 12-Tractor (manure) 3 Ton 13- Tractor (birds manure) 1.5 Ton 14- Truck (manure) 4 Ton 15- Truck (birds manure) 3 Ton 16- Lorry (manure) 6 Ton 17- Lorry (birds manure) 5 Ton **96- Other (specify)** **RECORD QUANTITY FOR EACH FERTILIZER MENTIONED IN Q.24. USE ONE COLUMN PER FERTILIZER. MAXIMUM 15 COLUMNS**										
			FERTILIZER 1		FERTILIZER 2		FERTILIZER 3		FERTILIZER 4		ADD COLUM	
		CODE	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	[___|___]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__]
	2	[___|___]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[___|___]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__]
	2	[___|___]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		26	27									
FIELD	PRIMARY CROP	Which pesticide(s) did your household apply to [PRIMARY CROP]? **PESTICIDE (LIST J)** **RECORD ALL MENTIONED**	How much [PESTICIDE] did your household apply to [PRIMARY CROP]? 1-Kilo (Kg) 2-Gram 3-Liter (Lt) 4-Milliliter (Ml) **RECORD QUANTITY FOR EACH PESTICIDE MENTIONED IN Q.26. USE ONE COLUMN PER PESTICIDE. MAXIMUM 15 COLUMNS**									
			PESTICIDE 1		PESTICIDE 2		PESTICIDE 3		PESTICIDE 4		ADD COLUM	
		CODE	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	[__|__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]
	2	[__|__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[__|__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]
	2	[__|__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]	1 2 3	[__|__|__].[__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		30						31					
Field ID	PRIMARY CROP	Did your household harvest [SECONDARY CROP] during the last summer harvest season? 1-Yes 0-No→**NEXT SECONDARY CROP** **ONE COLUMN FOR EACH SECONDARY CROP. MAXIMUM 20 COLUMNS**						How much [SECONDARY CROP] did your household harvest? **LIST K** **RECORD "00000.00" IF NONE AND GO TO NEXT SECONDARY CROP. MAXIMUM 20 COLUMNS**					
								CROP 1		CROP 2		ADD COLUMN	
		CROP 1		CROP 2		ADD COLUMN		CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	1	0	1	0	1	0	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	2	1	0	1	0	1	0	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS												
2	1	1	0	1	0	1	0	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	2	1	0	1	0	1	0	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS												

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		32						33				
Field ID	PRIMARY CROP	How much of the total harvest of [SECONDARY CROP] did your household keep for own consumption? **LIST** **RECORD "0000.00" IF NONE AND GO TO NEXT SECONDARY CROP**						How much of the total harvest of [SECONDARY CROP] did your ho sell? **LIST K** **RECORD "0000.00" IF NONE AND GO TO NEXT SECONDARY C MAXIMUM 20 COLUMNS**				
		CROP 1		CROP 2		ADD COLUMN		CROP 1		CROP 2		ADD CO
		CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE
1	1	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	2	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	2	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (SUMMER SEASON)

		34		
Field ID	PRIMARY CROP	What was the total amount that your household received for the total quantity [QUANTITY] of [SECONDARY CROP] sold? **ONLY FOR SECONDARY CROPS REPOTED IN Q33**		
		CROP 1	CROP 2	ADD COLUMN
		EGP	EGP	EGP
1	1	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	2	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS			
2	1	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	2	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS			

13. COSTS OF INPUTS (SUMMER SEASON)

READ: Finally, I would like to ask you about the total costs of fertilizers, pesticides, hired agricultural workers and machinery services, and diesel for operating the irrigation pumps that you **used for all crops during the last summer season**.

	1	2
FERTILIZER	You told me that your household applied [FERTILIZER FROM Q24]. How much did you pay for one UNIT of [UNIT FROM Q25]? **IF DOEST NOT KNOW RECORD "999999.98"**	How many kilograms [UNIT FROM Q25] of [FERTILIZER FROM Q24] ? **IF DOEST NOT KNOW RECORD "99999.998"**
	EGP	KILOGRAM
[FERTILIZER 1]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
[FERTILIZER 2]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
[FERTILIZER 3]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
[FERTILIZER 4]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
ONE ROW FOR EACH FERTILIZER REPORTED IN Q21 IN SECTION 12.MAXIMUM 20 ROWS		

13. COSTS OF INPUTS (SUMMER SEASON)

	3	4	
PESTICIDE	You told me that your household applied [PESTICIDE FROM Q26]. How much did you pay for one bag or bottle of [PESTICIDE FROM Q26]? **IF DOEST NOT KNOW RECORD 999999.98**	How much [PESTICIDE FROM Q26] were in this bag/bottle? **1 Kilogram** **2 Gram** **3 Liter** **4 Milliliter** **IF DOEST NOT KNOW RECORD 99999.998**	
	EGP	QUANTITY	UNIT
[PESTICIDE 1]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
[PESTICIDE 2]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
[PESTICIDE 3]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
[PESTICIDE 4]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
ONE ROW FOR EACH PESTICIDE REPORTED IN Q23 IN SECTION 12.MAXIMUM 20 ROWS			

5	**CHECK:** How many agricultural workers or agricultural machine operators to help with planting, weeding, spraying, or harvesting the crops of the last summer season did your household hire **in total for the season?** **RECORD TOTAL NUMBER OF WORKERS HIRED FOR THE SEASON. IF A WORKER WAS HIRED FOR DIFFERENT CROPS, RECORD WORKER ONLY ONCE**	NUMBER [___|___]	
	Were all workers paid in the same way?	Yes ……1 No ……0	→**ask the followig questions once**

13. COSTS OF INPUTS (SUMMER SEASON)

	6	7	8	9	
WORKER / OPERATOR	You told me that your household hired (NUMBER) agricultural workers or agricultural machine operators to help you with planting, weeding, spraying or harvesting in last winter/summer season. Did you hire the worker for the entire season, by month, week, day or hour? 1-Season 2-Month 3-Week 4-Day 5-Hour 96-Other **(SPECIFY)** 98-Doesn't know→**Q8**	Did your household pay Worker / Operator a cash wage or in-kind? 1 - Cash 2 - In-kind 3 – Cash and in-kind	How much did your household pay Worker / Operator [NUMBER] per [PERIOD]? **IF DOEST NOT KNOW RECORD "99999.98"** →**NEXT SECTION**	What was the estimated value of the in-kind payment that your household paid to Worker / Operator [NUMBER] per [PERIOD]? **IF DOEST NOT KNOW RECORD "99999.98"**	How many workers in this group of workers? Repeat the questions 6 to 9 until the sum of rows equal number in question 5
N	PERIOD	CODE	EGP	EGP	
1	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
2	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
3	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
4	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
ONE ROW FOR EACH WORKER/OPERATOR REPORTED IN Q5.MAXIMUM 20 ROWS					

11. FARM LAND (WINTER SEASON)

	Have you cultivated any crops during summer 2017 - 2018?	Yes.. ..... 1 No……...0	→ **End interview**

READ: Now, I would like to ask you about all the agricultural land that was cultivated or owned by your household **during the last winter season**. (**EXPLAIN:** The last winter season is the winter season in 2017 – 2018). Please tell me about ALL land cultivated by this household, regardless of whether the land is owned by your household or not.

1	How much agricultural land in total did your household cultivate whether owned or rented **during the last winter season**? **Recode the area duplicated if he cultivate a harvested crop an then cultivated another crop in the same land**	FEDDAN	KIRAT	Sahm
		[__|__]	[__|__]	[__|__]
2	Did your household have any agricultural land as fallow land during the last winter season?	Yes.. ..... 1 No……...0→**Q3a**		
3	How much agricultural land had your household, as fallow land, **during the last winter season**?	FEDDAN	KIRAT	Sahm
		[__|__]	[__|__]	[__|__]
3a	How much did your household harvest from the agricultural land **during the last winter season**? **Recode the area duplicated if he cultivate a harvested crop an then cultivated another crop in the same land**	FEDDAN	KIRAT	Sahm
		[__|__]	[__|__]	[__|__]
4	How many fields did your household harvested or cultivated **during the last winter seasons**? **(EXPLAIN: A FIELD IS A CONTINOUS PIECE OF LAND MANAGED BY THE SAME HOUSEHOLD FOR AGRICULTURAL PURPOSES)**	NUMBER		
		[__|__]		

11. FARM LAND (WINTER SEASON)

	5	6			7	8	9	10	11
FIELD	Where was Field [FIELD] located? 1- Old lands (Nile valley) 2- New lands (dessert) 8- Don't know	What was the land size of Field [FIELD]?			Was the Field [FIELD] owned by your household, rented, or borrowed? 1- Owned →**Q10** 2- Rented, for a rent 3- Rented, under a sharecropping agreement →**Q9** 4-Part rented, part under sharecropping agreement 5- Borrowed, for free →**Q10** 96 -Other **(SPECIFY)**	How much rent did your household pay for the total?	Which percent share of the crops did your household hand over to the owner of Field [FIELD]? **RECORD "98" IF FARMER DOES NOT KNOW** **SKIP THIS QUESTION IF Q7==2**	Did your household hire any machinery service for preparing Field [FIELD] for cultivation (for example, ploughing, leveling, contouring irrigation furrows)? 1- Yes 0- No → **Q12**	How much did your household pay for the preparation of Field [FIELD]?
	CODE	FEDDAN	KIRAT	Sahm	CODE	EGP	%	CODE	EGP
1	1 2 8	[__|__]	[__|__]	[__|__]	1 2 3 4 5 96	[__|__|__|__|__]	[__|__]	1 0	[__|__|__|__|__]
2	1 2 8	[__|__]	[__|__]	[__|__]	1 2 3 4 5 96	[__|__|__|__|__]	[__|__]	1 0	[__|__|__|__|__]
ONE ROW FOR EACH FIELD REPORTED IN QUESTION 4. MAXIMUM 20 ROWS									

11. FARM LAND (WINTER SEASON)

	12	**13**	**14**
FIELD	How did you irrigate Field [FIELD]? 1-By flooding areas or furrows in the field 2-Through a sprinkler system 3-Through a drip irrigation system 96 -Other **(SPECIFY)** 98- Don't know	Where did the water for irrigating Field [FIELD] come from? 1-Irrigation canal / river 2- Sewage canal / pipe 3- Borehole / well 96- Other **(SPECIFY)** 98- Don't know	During the planting period, how often was the water for irrigating Field [FIELD] available? 1-All day (and Night) 2-At least twice per day 3-Once per day 4-Every 2nd day 5- At least every 5th day (but more than every 2nd day) 6-At least every 10th day (but more than every 5th day) 96-Other frequency **(SPECIFY)** 98-Doesn't know
	CODE	CODE	CODE
1	1 2 3 96 98	1 2 3 96 98	1 2 3 4 5 6 96 98
2	1 2 3 96 98	1 2 3 96 98	1 2 3 4 5 6 96 98
ONE ROW FOR EACH FIELD REPORTED IN QUESTION 4. MAXIMUM 20 ROWS			

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

READ: Now, I would like to ask you about ALL crops on EACH field that your household **harvested during the last winter season**. (**EXPLAIN:** The last winter harvest season was in spring 2018)**.**

		1	28	29				2			4
FIELD	PRIMARY CROP	Which was/were the primary crop(s) that your household cultivated in Field [FIELD]? **(EXPLAIN: IF YOU PRACTICED INTERCROPPING IN A PART OF THE FIELD, THE PRIMARY CROP IS THE DOMINANT CROP DURING THE WINTER SEASON IN THIS PART OF THE FIELD.)** Please tell me all primary crops. → Any other primary crop? **CROP (LIST G)** **RECORD CROPS BY FIELD. SELECT CROPS FROM LIST G. IF CROP IS NOT IN LIST G, USE "OTHER (SPECIFY) OPTION" TO RECORD CROP**	Were there any secondary crops planted in between the [PRIMARY CROP] at the same time or on the edges of Field [FIELD]? Or, are there any fruit trees or date palms on Field [FIELD]? 1-Yes 0-No →**Q2**	Which was/were the secondary crop(s) that your household cultivated in Field [FIELD]? **IF NONE, RECORDE "0"** **ONE COLUMN FOR EACH SECONDARY CROP. MAXIMUM 7 COLUMNS**			Is there another crop in Field [FIELD]? 1-Yes 0-No	How many feddans or kirats of Field [FIELD] was planted with [PRIMARY CROP]? **CHECK: IS TOTAL LAND SIZE FOR ALL CROPS IN FIELD EQUAL TO REPORTED SIZE IN Q6 IN MODULE 11?**			In which month was [PRIMARY CROP] planted? **MONTH (LIST H)**
		CODE	CODE	CROP 1	CROP 2	ADD COLUMN	CODE	F	K	S	MONTH
1	1	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	2	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										
2	1	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	2	[___|___|___]	1 0	[___|___|___]	[___|___|___]	[___|___|___]	1 0	[___|___]	[___|___]	[___|___]	[___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

FIELD	PRIMARY CROP	5		5a	6	7	8	9	9a
		In which month of which year was [PRIMARY CROP] planted? **MONTH (LIST H)** **ONLY FOR PERENNIAL CROPS** PERENNIAL CROPS means: trees like orange, palm, lemon, grapes)		Do you have a FAS contract with a buyer for producing [CROP]? 1 Yes, FAS signed contract (individual or through association/cooperative) 2 Yes, committed FAS contract (individual or through association/cooperative) 3 Yes, but not through FAS 4 No	In how many batches was [PRIMARY CROP] harvested? **IF CROP WAS HARVESTED IN MORE THAN ONE BATCH SKIP TO Q8 (EXPLAIN: HARVESTING IN SEVERAL BATCHES MEANS THAT A CROP WAS HARVESTED AT DIFFERENT POINTS IN TIME)**	**In last winter season,** In which month was [PRIMARY CROP] harvested? **MONTH (LIST H)** **SKIP TO Q10**	**In last winter season** When was the first batch of [PRIMARY CROP] harvested? **MONTH (LIST H)**	**In last winter season** When was the last batch of [PRIMARY CROP] harvested? **MONTH (LIST H)**	Did your household hire agricultural workers or agricultural machinery services to help with planting, weeding, spraying, or harvesting of [PRIMARY CROP]? 1-Yes 0-No→**Q13**
		MONTH	YEAR	CODE	TIMES	MONTH	MONTH	MONTH	CODE
1	1	[___|___]	[___|___|___|___]	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	1 0
	2	[___|___]	[___|___|___|___]	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	1 0
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS								
2	1	[___|___]	[___|___|___|___]	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	1 0
	2	[___|___]	[___|___|___|___]	1 2 3 4	[___|___]	[___|___]	[___|___]	[___|___]	1 0
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS								

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		11	12		13		14		15		16	16a
FIELD	PRIMARY CROP	How many workers and machinery operators did your household hire for [PRIMARY CROP]?	How many days and hours **in total** did Worker / Operator [WORKER] work on [PRIMARY CROP]? **RECORD NUMBER OF DAYS AND HOURS SPENT BY EACH WORKER IN EACH CROPS.**		How much [PRIMARY CROP] did your household harvest **in total**? **LIST K**		How much of the total harvest of [PRIMARY CROP] did your household keep for own consumption? **LIST K** **RECORD "00000.00" IF NONE**		How much of the total harvest of [PRIMARY CROP] did your household sell? **LIST K** **RECORD "00000.00" IF NONE AND SKIP TO Q24**		Did your household sell the entire harvest of [PRIMARY CROP] all at once or in several batches? 1-All at once 2-In several batches **(EXPLAIN: SELLING IN SEVERAL BATCHES MEANS THAT THE TOTAL QUANTITY HARVESTED WAS SOLD TO SEVERAL DIFFERENT BUYERS/TRADERS OR TO THE SAME BUYER/TRADER AT DIFFERENT POINTS IN TIME AND AT DIFFERENT PRICES)**	**If Q.5a = 1 or 2,** Who was the buyer of [CROP]? 1-Single buyer / trader with whom your household had forward contract 2- Single buyer / trader, without forward contract 3- Several buyers in a wholesale market 4- Consumers in a local market 6- Other (**SPECIFY**) 8- Doesn't know
		NUMBER	DAYS	HOURS	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	CODE
1	1	[_|_|_]	[_|_|_]	[_|_|_]	[__|__]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	2	[_|_|_]	[_|_|_]	[_|_|_]	[__|__]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[_|_|_]	[_|_|_]	[_|_|_]	[__|__]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	2	[_|_|_]	[_|_|_]	[_|_|_]	[__|__]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	[_|_]	[_|_|_|_|_].[_|_]	1 2	1 2 3 4 6 8
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		17	18									
Field ID	PRIMARY CROP	**If Q.16 was all at once, skip to 18a.** In how many batches did your household sell the harvest of [PRIMARY CROP]?	How much [PRIMARY CROP] did your household sell each time? **RECORD QUANTITY SOLD FOR EACH BATCH REPORTED IN Q17.** **ONE COLUMN FOR EACH BATCH REPORTED IN Q17.** **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS** **(LIST K)**									
		NUMBER	BATCH 1		BATCH 2		BATCH 3		BATCH 4		ADD COLUMN	
			CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
	2	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										
2	1	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
	2	[__|__]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]	[__|__]	[_|_|_|_|_].[_|_]
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		18a					19				
Field ID	PRIMARY CROP	Have you experienced any troubles with the buyer in terms of getting back your money for the delivered harvest? 1 Yes, I did not get back any money 2 Yes, but not one time/delays 3 Yes, OTHER_SPECIFY 4 NO **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS**					In which month did your household sell the harvest of [PRIMARY CROP]? **MONTH (LIST H)** **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS**				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN	BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		CODE	CODE	CODE	CODE	CODE	MONTH	MONTH	MONTH	MONTH	MONTH
1	1	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	[__|__]
	2	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										
2	1	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	[__|__]
	2	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	[__|__]	[__|__]	[__|__]	[__|__]	[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS										

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		20				
Field ID	PRIMARY CROP	What was the total amount that your household received for the total quantity [QUANTITY] of [PRIMARY CROP] sold? **RECORD VALUE FOR EACH BATCH REPORTED IN Q17.** **IF HOUSEHOLD SOLD THE ENTIRE HARVEST ALL AT ONCE ONLY ONE COLUMN. MAXIMUM 10 COLUMNS**				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		EGP	EGP	EGP	EGP	EGP
1	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					
2	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		21					22				
Field ID	PRIMARY CROP	Who purchased the harvest of [PRIMARY CROP]? 1-Single buyer / trader with whom your household had forward contract 2- Single buyer / trader, without forward contract 3- Several buyers in a wholesale market→**Q24** 4- Consumers in a local market→ **Q24** 96- Other (**SPECIFY**) → **Q24** 98- Doesn't know→ **Q24** **READ ALL OPTIONS**					Did the buyer/trader pick up the harvest of [PRIMARY CROP] from your field or your farm? 1-Yes →**Q24** 0-No				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN	BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		CODE	CODE	CODE	CODE	CODE	CODE	CODE	CODE	CODE	CODE
1	1	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
	2	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS									
2	1	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
	2	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 2 3 4 96 98	1 0	1 0	1 0	1 0	1 0
		ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS									

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		23				
Field ID	PRIMARY CROP	What were the total costs for transporting the harvest of [PRIMARY CROP] to the point of sale (for example, for fuel or hiring transportation)?				
		BATCH 1	BATCH 2	BATCH 3	BATCH 4	ADD COLUMN
		EGP	EGP	EGP	EGP	EGP
1	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					
2	1	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	2	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]	[___|___|___|___|___]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS					

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		24	25											
FIELD	PRIMARY CROP	Which fertilizer(s) did your household apply to [PRIMARY CROP]? **FERTILIZER (LIST I)**	How much chemical and organic fertilizers [FERTILIZER] did your household apply to [PRIMARY CROP]? 1-Shikara, small (15 kg) 2-Shikara, medium (25 kg) 3-Shikara large (50 kg) 4-Kilogram (kg) 5-Gram (g) 6-Baraweta (manure) 50KG 7- Baraweta (birds manure) 30KG 8- Caro (manure) 500 KG 9- Caro (birds manure) 300KG 10- Small truck (manure) 1.5 Ton 11- Small truck (birds manure) 1 Ton 12-Tractor (manure) 3 Ton 13- Tractor (birds manure) 1.5 Ton 14- Truck (manure) 4 Ton 15- Truck (birds manure) 3 Ton 16- Lorry (manure) 6 Ton 17- Lorry (birds manure) 5 Ton **96- Other (specify)** **RECORD QUANTITY FOR EACH FERTILIZER MENTIONED IN Q.24. USE ONE COLUMN PER FERTILIZER. MAXIMUM 15 COLUMNS**										
			FERTILIZER 1		FERTILIZER 2		FERTILIZER 3		FERTILIZER 4		ADD COLUM	
		CODE	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	[__|__]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__]
	2	[__|__]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[__|__]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__|__]
	2	[__|__]	1 2 3 4 5 7	[__|__|__|__|__]	1 2 3 4 5 7	[__|__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__]	1 2 3 4 5 7	[__|__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		26	27									
FIELD	PRIMARY CROP	Which pesticide(s) did your household apply to [PRIMARY CROP]? **PESTICIDE (LIST J)** **RECORD ALL MENTIONED**	How much [PESTICIDE] did your household apply to [PRIMARY CROP]? 1-Kilo (Kg) 2-Gram 3-Liter (Lt) 4-Milliliter (Ml) **RECORD QUANTITY FOR EACH PESTICIDE MENTIONED IN Q.26. USE ONE COLUMN PER PESTICIDE. MAXIMUM 15 COLUMNS**									
			PESTICIDE 1		PESTICIDE 2		PESTICIDE 3		PESTICIDE 4		ADD COLUM	
		CODE	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	[__|__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]
	2	[__|__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[__|__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]
	2	[__|__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]	1 2 3 4	[__|__|__].[__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		30					31					
Field ID	PRIMARY CROP	Did your household harvest [SECONDARY CROP] during the last winter harvest season? 1-Yes 0-No→**NEXT SECONDARY CROP** **ONE COLUMN FOR EACH SECONDARY CROP. MAXIMUM 20 COLUMNS**					How much [SECONDARY CROP] did your household harvest? **LIST K** **RECORD "00000.00" IF NONE AND GO TO NEXT SECONDARY CROP. MAXIMUM 20 COLUMNS**					
							CROP 1		CROP 2		ADD COLUMN	
		CROP 1	CROP 2	ADD COLUMN			CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY
1	1	1 0	1 0	1 0			[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	2	1 0	1 0	1 0			[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	1 0	1 0	1 0			[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	2	1 0	1 0	1 0			[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		32						33				
Field ID	PRIMARY CROP	How much of the total harvest of [SECONDARY CROP] did your household keep for own consumption? **LIST K** **RECORD "0000.00" IF NONE AND GO TO NEXT SECONDARY CROP**						How much of the total harvest of [SECONDARY CROP] did your ho **LIST K** **RECORD "0000.00" IF NONE AND GO TO NEXT SECONDARY C 20 COLUMNS**				
		CROP 1		CROP 2		ADD COLUMN		CROP 1		CROP 2		A
		CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE	QUANTITY	CODE
1	1	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	2	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											
2	1	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	2	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]	[__|__|__|__].[__|__]	[__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS											

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

		34		
Field ID	PRIMARY CROP	What was the total amount that your household received for the total quantity [QUANTITY] of [SECONDARY CROP] sold? **ONLY FOR SECONDARY CROPS REPOTED IN Q33**		
		CROP 1	CROP 2	ADD COLUMN
		EGP	EGP	EGP
1	1	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	2	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS			
2	1	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	2	[__|__|__|__|__]	[__|__|__|__|__]	[__|__|__|__|__]
	ONE ROW FOR EACH CROP REPORTED IN QUESTION 1. MAXIMUM 20 ROWS			

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

READ: Finally, I would like to ask you about the total costs of fertilizers, pesticides, hired agricultural workers and machinery services, and diesel for operating the irrigation pumps that you **used for all crops during the last winter season**.

	1	2
FERTILIZER	You told me that your household applied [FERTILIZER FROM Q24]. How much did you pay for one UNIT of [UNIT FROM Q25]? **IF DOEST NOT KNOW RECORD "999999.98"**	How many kilograms [UNIT FROM Q25] of [FERTILIZER FROM Q24] ? **IF DOEST NOT KNOW RECORD "99999.998"**
	EGP	KILOGRAM
[FERTILIZER 1]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
[FERTILIZER 2]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
[FERTILIZER 3]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
[FERTILIZER 4]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]
ONE ROW FOR EACH FERTILIZER REPORTED IN Q24 IN SECTION 12.MAXIMUM 20 ROWS		

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

	3	4	
PESTICIDE	You told me that your household applied [PESTICIDE FROM Q26]. How much did you pay for one bag or bottle of [PESTICIDE FROM Q26]? **IF DOEST NOT KNOW RECORD 999999.98**	How much [PESTICIDE FROM Q26] were in this bag/bottle? **1 Kilogram** **2 Gram** **3 Liter** **4 Milliliter** **IF DOEST NOT KNOW RECORD 99999.998**	
	EGP	QUANTITY	UNIT
[PESTICIDE 1]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
[PESTICIDE 2]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
[PESTICIDE 3]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
[PESTICIDE 4]	[___|___|___|___|___|___|. |___|___]	[___|___|___|___|___|. |___|___|___]	[___]
ONE ROW FOR EACH PESTICIDE REPORTED IN Q26 IN SECTION 12.MAXIMUM 20 ROWS			

5	**CHECK:** How many agricultural workers or agricultural machine operators to help with planting, weeding, spraying, or harvesting the crops of the last winter season did your household hire **in total for the season?** **RECORD TOTAL NUMBER OF WORKERS HIRED FOR THE SEASON. IF A WORKER WAS HIRED FOR DIFFERENT CROPS, RECORD WORKER ONLY ONCE**	NUMBER [___|___]	
	Were all workers paid in the same way?	Yes ……1 No ……0	→**ask the followig questions once**

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

	6	7	8	9	
WORKER / OPERATOR	You told me that your household hired (NUMBER) agricultural workers or agricultural machine operators to help you with planting, weeding, spraying or harvesting in last winter/summer season. Did you hire the worker for the entire season, by month, week, day or hour? 1-Season 2-Month 3-Week 4-Day 5-Hour 96-Other **(SPECIFY)** 98-Doesn't know→**Q8**	Did your household pay Worker / Operator a cash wage or in-kind? 1 - Cash 2 - In-kind 3 – Cash and in-kind	How much did your household pay Worker / Operator [NUMBER] per [PERIOD]? **IF DOEST NOT KNOW RECORD "99999.98"** →**NEXT SECTION**	What was the estimated value of the in-kind payment that your household paid to Worker / Operator [NUMBER] per [PERIOD]? **IF DOEST NOT KNOW RECORD "99999.98"**	How many workers in this group of workers? Repeat the questions 6 to 9 until the sum of rows equal number in question 5
N	PERIOD	CODE	EGP	EGP	
1	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
2	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
3	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
4	1 2 3 4 5 96 98	1 2 3	[___|___|___|___|___].[___|___]	[___|___|___|___|___].[___|___]	[___|___]
ONE ROW FOR EACH WORKER/OPERATOR REPORTED GROUP .MAXIMUM 20 ROWS					

LIST G: CROPScrops

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

101	Wheat	124	Peanuts	204	Pomegranate	316	Mint
102	Clover	125	Cabbage	205	Figs	317	Chamomile
103	Barley	126	Cauliflower	206	Orange	318	Calendula
104	White beans	127	Eggplant	207	Henna	319	Geranium
105	Cucumber	128	Peas	208	Banana	320	Table grape
106	Zucchini	129	Okra	209	Other perennial crops (specify)	321	Pomegranate
107	Tomatoes	130	Molokhia	210	Other perennial crops (specify)	322	Other summer crops (specify)
108	Spinach	131	Artichoke	211	Other perennial crops (specify)	323	Other summer crops (specify)
109	Pepper	132	Taro	301	Green beans	324	Other summer crops (specify)
110	Garlic	133	Radish	302	Onion	0	None
111	Onions	134	Kale	303	Sweet potato		
112	Bean	135	Lettuce	304	Celery		
113	Linen	136	Carrot	305	Fennel		
114	Lupine	137	Cow pea	306	Basil		
115	Potatoes	138	Lentils	307	Majoram		
116	Fenugreek	139	Chickpea	308	Thyme		
117	Mint	140	Beet	309	Anise		
118	Fennel	141	Other winter crops (specify)	310	Parsley		
119	Basil	142	Other winter crops (specify)	311	Cilantro		
120	Cumin	143	Other winter crops (specify)	312	Dill		
121	Black seed	201	Clover	313	Cumin		
122	Coriander	202	Tangerine	314	Black cumin		
123	Moon flower	203	Guava	315	Pepper		

List H		List I		List J		List K	
01	JANUARY	A	Urea/Azote from agricultural association(blue/white)	A	Viagra	1	KILO
02	FEBRUARY	B	Urea/Azote from black market (blue/white)	B	Sulfur	2	TON
03	MARCH	C	Nitrate from agricultural association (blue/white)	C	Jessica guard	3	ARDAB
04	APRIL	D	Nitrate from black market (blue/white)	D	Fuzlade	4	SHEWAL SMALL (25 KG)
05	MAY	E	Super sulphate	E	Prominal	5	SHEWAL MEDIUM (50 KG)
06	JUNE	F	Ammonia	F	Lanite	6	SHEWAL LARGE (100 KG)
07	JULY	G	Potassium	G	Ecotec	7	OTHER SHEWAL SIZE (SPECIFY)
08	AUGUST	H	Special chemical fertilizer	H	Dayel 2x	8	AADAYA SMALL (7 KG)
09	SEPTEMBER	I	Manure	I	Lambada	9	AADAYA LARGE (20 KG)
10	OCTOBER	J	Potassium sulphate	J	Super eyamoks	10	Hasha for Clover

12. CROP PRODUCTION AND HARVEST (WINTER SEASON)

11	NOVEMBER
12	DECEMBER

K	Super star
L	Other (specify)
M	Other (specify)
N	Other (specify)
O	Ammonium nitrate
P	Humic acid
Q	Triple
Z	Does not use any fertilizer

K	Al pasha
L	Yourmakren
M	Kazblan
N	Humic acid
O	Saydon
P	Malasyon
Q	Stok
R	Marshal
S	Redomil
T	Bastiban, gesaprim (atrazine) and goal
U	Sparckle
Y	Topic, poison and mosiplan
V	Other (specify)
W	Other (specify)
X	Other (specify)
Z	None

96	Other (specify)

15. HOUSEHOLD DIETARY DIVERSITY

RESPONDENT: MEAL PREPARER

READ: Now, I would like to ask you questions on the different kinds of food you or anyone else in your household has eaten **yesterday during the day and at night** (24 hours; **EXPLAIN**).

Respondent's name and IDP
_____ IDP [___|___] Name

Yesterday, during the day or night, have you or anyone in your household eaten:

1	Any bread, rice, pasta, biscuits, or any other cereal product?	Yes .....1 No 0
2	Any potatoes, sweet potatoes, or any other kind of foods made from tubers and roots?	Yes .....1 No 0
3	Any vegetables?	Yes .....1 No 0
4	Any fruits?	Yes .....1 No 0
5	Any beef, mutton, camel, rabbit, chicken, duck, chicken or other birds, liver, kidney, heart or other organ meats?	Yes .....1 No 0
6	Any eggs?	Yes .....1 No 0
7	Any fresh or dried fish or shellfish?	Yes .....1 No 0
8	Any foods made from beans, peas, nuts, or any other kind of food made from pulses?	Yes .....1 No 0
9	Any cheese, yogurt, milk, rayeb, or other milk products?	Yes .....1 No 0
10	Any food made with oil, fat, butter, or ghee?	Yes .....1 No 0
11	Any sugar, honey, or molasses?	Yes .....1 No 0
12	Any other foods such as condiments, coffee, tea?	Yes .....1 No 0

17. MOTHER'S DIETARY DIVERSITY

RESPONDENT : MOTHER OF "Child less than 2 years" OR MOTHER OF "Child 2-5 years" OR CARETAKER OF "Any child".
READ: Now I'd like to ask you to describe everything that **you** ate or drank **yesterday** during the day or night, whether you ate it at home or anywhere else. Please include all foods and drinks, any snacks or small meals, as well as any main meals. Remember to include all foods you may have eaten while preparing meals or preparing food for others. Please also include food you ate even if it was eaten elsewhere, away from your home. (24 hours; **EXPLAIN**).

Respondent's name and IDP
_____ IDP [___|___]
Name

1	Foods made from grains	Bread, rice, pasta, or other cereal product	Yes ..... 1 No 0
2	White roots and tubbers	Potatoes, turnip, taro root, or other food made from white-fleshed roots or tubers, or plantains	Yes ..... 1 No 0
3	Pulses (beans and lentils)	Beans, chickpeas, lentils, or other bean/pea products	Yes ..... 1 No 0
4	Nuts and seeds	Any tree nuts, groundnut/peanuts or certain seed "butters" or pastes	Yes ..... 1 No 0
5	Milk and milk products	Milk, cheese, yoghurt, or other milk products but NOT including butter, ice cream, or cream	Yes ..... 1 No 0
6	Organ meat	Liver, kidney, heart or other organ meats	Yes ..... 1 No 0
7	Meat and poultry	Beef, lamb, rabbit, chicken, pigeon, or other meat or bird	Yes ..... 1 No 0
8	Fish and seafood	Fresh or dried fish, shellfish or seafood	Yes ..... 1 No 0
9	Eggs	Eggs from poultry or any other bird	Yes ..... 1 No 0
10	Dark green leafy vegetables	Dark green leafy vegetables (molokhia, chilli greens, spinach, etc.)?	Yes ..... 1 No 0
11	Vitamin A-rich vegetables, roots and tubers	Carrot, pumpkin, squash or sweet potatoes that are yellow or orange inside	Yes ..... 1 No 0
12	Vitamin A-rich fruits	Ripe mango, ripe cantaloupe melon, apricot, red palm fruit, or other dark yellow or orange fruits	Yes ..... 1 No 0
13	Other vegetables	Onion, tomato, cucumber, okra, eggplant, green beans, etc.	Yes ..... 1 No 0

17. MOTHER'S DIETARY DIVERSITY

14	Other fruits	Olives, figs, dates, apple, orange, lemon, pineapple, etc.	Yes ..... 1 No..... 0
15	Oils and fats	Oil, fats, ghee or butter added to food or used for cooking, including extracted from nuts, fruits and seeds, and all animal fat	Yes ..... 1 No..... 0
16	Savory and fried snacks	Crisps and chips	Yes ..... 1 No..... 0
17	Sweets	Sugary foods , such as chocolates, cookies/sweet biscuits and cakes, ice cream or sweet pastries	Yes ..... 1 No..... 0
18	Sugar-sweetened beverages	Sweetened fruit juices, soft drinks/soda drinks, chocolate drinks, yoghurt drinks, or sweet tea or coffee with sugar	Yes ..... 1 No..... 0
19	Condiments and seasonings	Ingredients used in small quantities for flavour, such as chillies, spices, herbs, tomato paste, flavor cubes or seeds	Yes ..... 1 No..... 0
20	OTHER FOODS **(SPECIFY)**	Tea or coffee if not sweetened, pickles, etc. **RECORD HERE ALL OTHER FOODS NAMED BY THE RESPONDENT THAT ARE NOT IN THE LIST:**	_____ _____

18. GENERAL HEALTH AND NUTRITION KNOWLEDGE

RESPONDENT: MOTHER OF "CHILD LESS THAN 2 YEARS" OR MOTHER OF "CHILD 2-5 YEARS", OR ANY CARETAKER, OR MEAL PREPARER.

READ: Now, I would like you to ask you some questions about health and nutrition.

Respondent's name and IDP
_____ IDP [___|___]
Name

1	When should you wash your hands? Any other time? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Before meals ..... A After using the bathroom ..... B Before feeding a child ..... C After cleaning child's bowel movement ..... D Before food preparation tasks ..... E After coming from the farm ..... F After handling animals ..... G After meal eating ..... H Other (**SPECIFY**) ..... X Does not know ..... Z	
2	Aside from water, what products can be used to wash hands? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Soap ..... A Powder detergent ..... B Liquid soap ..... C Ashes ..... D Sand/mud ..... E Dettol ..... F Other (**SPECIFY**) X	
3	What can be done to purify water so that you can drink it? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Boil the water ..... A Treat with chlorine or water tablet ..... B Use filter ..... C Other (**SPECIFY**) ..... X Does not know ..... Z	
4	A daily healthy balanced diet should consist of different food groups. Could you tell me what these food groups are? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Cereals (rise, bread), white roots and tubers (potatoes..) A Pulses (beans, lentils) and nuts (peanuts) ..... B Milk and dairy products (chees ,rayb, yoghurt) ..... C Meat, poultry and fish products ..... D Eggs ..... E Dark green leafy vegetables (molokhia, spinach) ..... F Vitamin-A rich / orange colored fruits and vegetables (mangoes, carrots, pumpkin, orange sweet potatoes) ..... G Other fruits and vegetables ..... H Other (**SPECIFY**) ..... X Does not know ..... Z	
5	Could you give me examples of sources of fats? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Butter / ghee ..... A Margarine ..... B Vegetable cooking oils ..... C Animal fat ..... D Cream ..... E Other (**SPECIFY**) ..... X Does not know ..... Z	

18. GENERAL HEALTH AND NUTRITION KNOWLEDGE

6	Which foods are rich in iron? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Meat (veal, mutton,..), poultry and fish ..... A Green leafy vegetables (spinach, mallow, molokhia watercress and parsley) ..... B Molasses……C Beans ..... D Nuts ..... E Liver.....F Eggplants ..... G Other (**SPECIFY**) _____ X Does not know .....Z	
7	Could you give me examples of foods rich in starches? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Cereals (rice, bread, wheat, pasta, barley, maize) ..... A Potato ..... B Sweet potatoes ..... C Other (**SPECIFY**) ..... X Does not know .....Z	
8	Why is it important for the body to consume vegetables and fruits? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Source of vitamins (e.g. vitamin C, vitamin A, folic acid) A Source of minerals (e.g. calcium, iron, zinc) ..... B Source of fiber ..... C Source of antioxidants..... D Other (**SPECIFY**) ..... X Does not know…… Z	
9	Animal source foods like eggs, fish, chicken, beef, and milk contains an important component to the diet. What is it? **DO NOT MAKE SUGGESTIONS**	Protein ..... A Other (**SPECIFY**) ..... X Does not know .....Z	
10	Proteins can be gained from animal source food such as eggs, fish, chicken and through some plants. What are examples of plants that provide the body with proteins? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Fava beans ..... A Beans (red, white, black)..... B Lentils ..... C Chickpeas ..... D Cowpeas ..... E Peanuts .....F Other (**SPECIFY**) ..... X Does not know ……Z	
11	How can adults and children maintain a healthy bodyweight and prevent one to be become overweight or obese? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Eat healthy foods/balanced diet ..... A Eat fruits and vegetables..... B Minimize sugar and soft drink consumption..... C Minimize processed food intake..... D Regular physical exercise (walking, running, etc) ..... E Minimize watching TV or playing electronic games .....F Other (**SPECIFY**) X	

18. GENERAL HEALTH AND NUTRITION KNOWLEDGE

READ: Now, I would like to ask you questions about your own body. I will read out some sentences to you, and you tell me whether you agree, disagree of feel neutral about them.

12	I do not have to worry about the kind of foods I eat **READ OPTIONS; ONE RESPONSE**	Agree ……..1 Neutral…….. ……..2 Disagree …….. 3	
13	Eating fruit and vegetables every day is good for your body **READ OPTIONS; ONE RESPONSE**	Agree ……..1 Neutral…….. ……..2 Disagree …….. 3	
14	When you eat too much fat and oil you can become fat **READ OPTIONS; ONE RESPONSE**	Agree ……..1 Neutral…….. ……..2 Disagree …….. 3	
	READ: Eating a lot of sugar, sweets and sweet food, and drinking lots of sugary drinks such as soft drinks, …		
15	… is good for health **READ OPTIONS; ONE RESPONSE**	Agree ……..1 Neutral…….. ……..2 Disagree …….. 3	
16	… can make you fat **READ OPTIONS; ONE RESPONSE**	Agree ……..1 Neutral…….. ……..2 Disagree …….. 3	
17	… is bad for your teeth **READ OPTIONS; ONE RESPONSE**	Agree ……..1 Neutral…….. ……..2 Disagree …….. 3	

READ: Now, I would like you to read a sentence for me.

22	**IF EDUCATIONAL LEVEL LESS THAN UNIVERSITY.** Can you read this sentence outloud? **NOTE FOR INTERVIEWER: SHOW A CARD TO THE RESPONDENT. IF SHE CANNOT READ EVERYTHING, ENCOURAGE HER .** **COULD SHE READ OR NOT?**	Cannot read at all ..... 1 Can read a little..... 2 Can read everything 3
ASK THE RESPONDENT TO READ 1 OF THE 2 FOLLOWING SENTENCES OUT LOUD:		
We must take good care of the children for them to be healthy		

18. GENERAL HEALTH AND NUTRITION KNOWLEDGE

A healthy child learns better in school

19. MOTHER/CAREGIVER HEALTH AND NUTRITION KNOWLEDGE

RESPONDENT: MOTHER OF "CHILD LESS THAN 2 YEARS" OR MOTHER OF "CHILD 2-5 YEARS", OR ANY CARETAKER.

READ: Now, I would like to ask you questions about your knwoledge on pregnancy, children's health and nutrition.

Respondent's name and IDP
_____ IDP [___|___]
Name

1	What type of risk signs should lead a pregnant woman go see a doctor immediatly? (Signs that show the mother or the baby are at risk during the mother's pregnancy) **RECORD ALL ANSWERS GIVEN** **DO NOT MAKE SUGGESTIONS**	Vaginal bleeding....A Vaginal discharge....B High fever....C Abdominal pain....D Severe and persistent headache....E Vision trouble....F Difficulty breathing....G Swollen body/face, hands....H No or changes in fetal movement....I Other (**SPECIFY**)....X Does not know....Z	
2	Sometimes, children have serious ailments and should be taken right away to a medical facility. What are the signs/symptoms of the child that would make you take him/her to a medical facility right away (health center, hospital)? What else? **ENCOURAGE THE RESPONDENT TO LIST MORE SIGNS/SYMPTOMS UNTIL SHE IS NO LONGER ABLE TO.** **DO NOT MAKE SUGGESTIONS.** **RECORD ALL ANSWERS GIVEN**	The child cannot drink or breastfeed....A The child is getting sicker....B The child is running a fever....C The child is breathing fast....D The child has trouble breathing....E The child has bloody stools....F Other (**SPECIFY**) ....X Does not know ....Z	
3	After birth, when should the baby be breastfed for the first time ? **ONE ANSWER**	Right away....1 Less than one hour after birth....2 Between 1 and 24 hours....3 One day later....4 More than a day later....5 Does not know....8	
4	Should a newborn be fed colostrum ?	Yes....1 No....0 Does not know....8	→**Q6** →**Q6**
5	Why is it important for the newborn to be fed colostrum? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Improves the baby's health....A Makes him/her more immune to diseases....B Contains nutrients/helps child's growth....C Helps the baby to have bowel movement (laxative)....D Other (**SPECIFY**) ....X Does not know....Z	

19. MOTHER/CAREGIVER HEALTH AND NUTRITION KNOWLEDGE

6	At what age (in months) should a baby be introduced to other liquids (other than breast milk)? **ONE RESPONSE**	**MONTHS** [___|___] 00=Under 1 month 98=Does not know	
7	At what age (in months) should a baby be introduced to solid food (other than breast milk)? **ONE RESPONSE**	**MONTHS** [___|___] 00=Under 1 month 98=Does not know	
8	Why is it said that <u>a baby under 6 months</u> should be exclusively breastfed? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Protect baby from diseases ..... A Help baby's growth..... B Breastmilk is a complete food during the first 6 months . C Less risk of pregnancy for the mother..... D Postponement of period for the mother ..... E Breastmilk is healthy and pure.....F Free ..... G Reduction of medical costs ..... H Other **(SPECIFY*)*** ……X Does not know .....Z	
9	Why is it important for a child to consume other food beside breastfeeding, after the 6th month? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Breast milk alone is not enough to provide the baby with the necessary nutrients at this age……A Breast milk does not contain enough energy for a child at this age ……..B If other foods are not given children cannot develop appropiately……C Other (**SPECIFY**)……..X Does not know .....Z	
10	When, or under which circumstance/case should a child receive ORS? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	When the child has diarrhea ..... A Other **(SPECIFY*)*** ……..X Does not know .....Z	
11	What can be done to prevent children from getting diarrhea? Anything else? RECORD ALL RESPONSES DO NOT MAKE SUGGESTIONS	Using clean water ..... A Washing hands ..... B Making sure food is clean ..... C Cooking food well before presentation..... D Disposing all types of waste safely ..... E Controlling/fighting flies.....F Breastfeeding ..... G Improving feeding practices ..... H Measles vaccination.....I Treatment of respiratory diseases .....J Treatment of middle ear infection ..... K Treatment of urinary tract infection .....L Treatment of parasite .....M Other (SPECIFY)……X Does not know……Z	

19. MOTHER/CAREGIVER HEALTH AND NUTRITION KNOWLEDGE

12	What should be done when a child is suffering from diarrhea? Anything else? RECORD ALL RESPONSES DO NOT MAKE SUGGESTIONS	Continue breastfeeding newborns ..... A Provide the baby fluids frequently (clean water, lemon juice, cumin, mint, and natural juices without sugar) ..... B Provide easily digestible food (potatoes, apples and bananas, mashed carrots, and vegetable soup) ..... C Give the child a ORS..... D Do not give any medicines unless the doctor is consulted ..... E Other (SPECIFY)……X Does not know……..Z	
13	What are the potential effects of poor nutition on children's health? Anything else? RECORD ALL RESPONSES DO NOT MAKE SUGGESTIONS	Kwashiorkor disease……A Wasting ..... B Stunting ..... C Frequent fatigue ..... D Rickets..... E Anemia .....F Fatigue ..... G Frequent sickness ..... H Other (SPECIFY) ……X Does not know .....Z	
14	Which symptoms could indicate that a child has anemia? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Impaired learning _____ A Impaired development_____ B Poor concentration _____ C Slow growth_____ D Low immunity _____ E Fatigue _____F Dizziness_____ G Shortness of breath_____ H Rapid heartbeat_____ I Paleness of the face _____J Yellowing in the eye _____ K Swelling of the spleen _____L Dark brown urine_____ M Other (SPECIFY)……X Does not know _____Z	

20. INFANT AND CHILD FEEDING PRACTICES

RESPONDENT : BIOLOGICAL MOTHER OF "CHILD LESS THAN 2 YEARS" OR CARETAKER OF "CHILD LESS THAN 2 YEARS"
READ: Now, I would like to ask you some questions about ***(NAME CHILD)***.

CHECK NUMBER OF CHILDREN AND RECORD THE YOUNGEST CHILD			
1	Name and IDP for selected CHILD **RECORD NAME AND IDP FOR THE SELECTED CHILD A (ELIGIBLE CHILD SECTION) AND HIS/ HER MOTHER/ CARETAKER.**	**RECORD THE CHILD LESS THAN 2 YEARS** _____ IDP [___|___] 98=No CHILD Mother/caretaker _____ IDP [___|___]	**IF NO CHILD LESS THAN 2 YEARS, MOVE TO THE NEXT SECTION**
2	Has [***NAME CHILD]*** ever been breastfed?	Yes..... ……1 No..... 0 Does not know ……..8	**→ Q3a** **→ Q3a**
3	Was [NAME CHILD] breastfed yesterday during the day or at night?	Yes..... 1 No..... 0 Does not know ……8	**→ Q4**
3a	**Sometimes babies are fed breast milk in different ways, for example by spoon, cup or bottle. This can happen when the mother cannot always be with her baby. Sometimes babies are breastfed by another woman, or given breast milk from another woman by spoon, cup or bottle or some other way. This can happen if a mother cannot breastfeed her own baby.** Did [NAME CHILD] consume breast milk in any of these ways yesterday during the day or at night?	Yes..... 1 No..... 0 Does not know……8	
4	**Now I would like to ask you about some medicines and vitamins that are sometimes given to infants.** Was [NAME CHILD] given any vitamin drops or other medicines as drops yesterday during the day or at night?	Yes..... 1 No..... 0 Does not know……8	
5	Was [NAME CHILD] given ORS (mahlool gafaf) yesterday during the day or at night?	Yes..... 1 No..... 0 Does not know……8	

20. INFANT AND CHILD FEEDING PRACTICES

READ THE QUESTIONS BELOW. READ THE LIST OF LIQUIDS ONE BY ONE AND MARK YES OR NO, ACCORDINGLY. AFTER YOU HAVE COMPLETED THE LIST, CONTINUE BY ASKING QUESTION 7 FOR THOSE ITEMS (6B, 6C, AND/OR 6F) WHERE THE RESPONDENT REPLIED 'YES'.

		Code			7
6	Now I would like to ask you about some liquids that [NAME CHILD] may have had yesterday during the day or at night.? Yesterday, during the day or at night, did [NAME CHILD] have any : …… ?	YES	NO	DOES NOT KNOW	Yesterday, during the day or night, how many times did [NAME CHILD] consume any [ITEM FROM FOOD LIST] ? **QUESTION 7 FOR ITEMS B, C, AND F IF CHILD CONSUMED THE ITEM.** **RECORD '98' FOR DOES NOT KNOW.**
6a	Plain water?	1	0	8	
6b	Baby formula?	1	0	8	**TIMES** [___|___]
6c	Boxed milk, other powdered milks, or fresh animal milk?	1	0	8	**TIMES** [___|___]
6d	Juice or juice-based drinks?	1	0	8	
6e	Clear broth?	1	0	8	
6f	Youghurt?	1	0	8	**TIMES** [___|___]
6g	Soft porridge?	1	0	8	
6h	Any other liquid such as tea, Fanta, anise?	1	0	8	
6i	Any other liquids?	1	0	8	

20. INFANT AND CHILD FEEDING PRACTICES

7a	Did [NAME CHILD] ever eat solid or semi-solid food?	Yes ..... 1 No ..... 0 Does not know 8	→**NEXT SECTION**

8	Now, please tell me everything that [NAME CHILD] ate yesterday during the day or night (24 hours; EXPLAIN), at home or outside. ***a)*** Yesterday, <u>when awaking</u>, did [NAME CHILD] eat anything? **IF YES: ASK** Tell me all that [NAME CHILD] ate when he/she woke up. **INSIST:** Anything else? **UNTIL RESPONDENT HAS NOTHING MORE TO ADD.** **IF NOT: GO TO QUESTION b).** ***b)*** What did [NAME CHILD] eat after he/she woke up? **INSIST:** Anything else? **UNTIL RESPONDENT HAS NOTHING MORE TO ADD.** **REPEAT QUESTION *b)* UNTIL RESPONDENT SAYS CHILD FELL ASLEEP UNTIL NEXT DAY.** **IF THE RESPONDENT MENTIONS MIXED DISHES, IN SAUCE OR STEW, INSIST:** ***c)*** What foods did you use to prepare this [STEW]? **INSIST:** Anything else? **UNTIL RESPONDENT HAS NOTHING MORE TO ADD.** **WHEN THE RESPONDENT NAMES THE INGREDIENTS USED IN THE STEW, FIND EACH ONE OF THEM IN THE LIST OF FOODS AND CIRCLE « 1 » (YES) FOR THIS INGREDIENT. IF THIS INGREDIENT IS NOT MENTIONED IN THE LIST OR IN OTHER FOOD GROUPS, WRITE ITS NAME IN THE BOX CALLED « OTHER FOODS ».** **IF THESE INGREDIENTS ARE USED IN SMALL QUANTITY TO SEASON THE DISH, OR AS A CONDIMENT, ADD THEM TO THE GROUP OF CONDIMENTS.** **WHEN THE RESPONDENT IS DONE NAMING ALL CONSUMED FOODS, RECORD YES FOR ALL MENTIONED FOOD ITEMS AND ASK THE RESPONDENT WHETHER THE FOOD THAT WAS'NT MENTIONED WAS CONSUMED :** ***d)*** Yesterday, during the day or at night, did [NAME CHILD] drink/eat [FOOD]? **RECORD *"1" or "0" or "8"* ACCORDING TO RESPONSE.**

8a	Bread, rice, pasta, couscous, biscuits, porridge, or any other kinds of food made from flour grain/cereals (such as wheat, rice, maize)?	Yes ..... 1 No ..... 0 Does not know 8	
8b	Potato, white sweet potato, French fries, turnip, taro root, or any other kind of food made from starchy tubers and roots with white or light yellow flesh?	Yes ..... 1 No ..... 0 Does not know 8	
8c	Beans, peas, chickpeas, lentils, or any other kind of food made from pulses?	Yes ..... 1 No ..... 0 Does not know 8	
8d	Nuts, peanuts, seeds; or any other kind food made from nuts / seeds?	Yes ..... 1 No ..... 0 Does not know 8	
8e	Cheese, yogurt, milk, rayeb, or other dairy products?	Yes ..... 1 No ..... 0 Does not know 8	
8f	Liver, kidney, heart or other animal giblets?	Yes ..... 1 No ..... 0 Does not know 8	
8g	Beef, mutton, camel, rabbit, chicken, duck, or other meat or poultry?	Yes ..... 1 No ..... 0 Does not know 8	

20. INFANT AND CHILD FEEDING PRACTICES

8h	Fresh or preserved fish or crustaceans?	Yes ..... 1 No ..... 0 Does not know 8	
8i	Eggs?	Yes ..... 1 No ..... 0 Does not know 8	
8j	Fresh or dried fish, shrimp?	Yes ..... 1 No ..... 0 Does not know 8	
8k	Dark green leafy vegetables (mulukhiyah, spinach, mallow, etc.)?	Yes ..... 1 No ..... 0 Does not know 8	
8l	Carrot, squash, sweet potato with yellow or orange flesh, sweet red peppers , or other dark yellow / orange / red-fleshed vegetables?	Yes ..... 1 No ..... 0 Does not know 8	
8m	Ripe mango, ripe cantaloupe melon, apricot, or other dark yellow / orange / red-fleshed fruits?	Yes ..... 1 No ..... 0 Does not know 8	
8n	Other vegetables (onion, tomato, cucumber, okra, eggplant, green beans, green pepper)	Yes ..... 1 No ..... 0 Does not know 8	
8o	Other fruits (olives, figs, dates, apple, orange, lemon, grapes, watermelon, guava)	Yes ..... 1 No ..... 0 Does not know 8	
8p	Oil, fat, butter, or ghee?	Yes ..... 1 No ..... 0 Does not know 8	
8q	Sugar, honey, molasses, or sweets (chocolate, candies, ice cream, sweet pastries, etc.)?	Yes ..... 1 No ..... 0 Does not know 8	
8r	Condiments and seasonings (chillie peppers, spices, herbs, tomato paste, etc.)	Yes ..... 1 No ..... 0 Does not know 8	
8s	**OTHER FOOD:** **RECORD HERE ALL OTHER FOOD NAMED BY THE RESPONDENT THAT ARE NOT IN THE LIST:**	_____ _____ _____ _____ _____ _____	
9	**CHECK Q8A TO Q8R:**	All "0"(No) ..... 1 "1" (Yes) at least once ..... 2 All « Does not know » 8	**→Q10** **→Q11** **→Q11**

20. INFANT AND CHILD FEEDING PRACTICES

10	**JUST TO BE SURE:** Yesterday, during the day or at night, (in addition to liquids) did [NAME CHILD] eat solid, semi-solid, or soft food? **IF « YES » QUESTION :** Yesterday, during the day or night, what kind of solid, semi-solid, or soft food did [NAME CHILD] eat?	Yes ..... 1 No ..... 0 Does not know..... 8	→ **RETURN TO Q7 AND RECORD FOODS CONSUMED. THEN GO TO Q11** **→ Q12** **→ Q12**
11	Yesterday, during the day or at night, (in addition to liquids) how many times did [NAME CHILD] eat solid, semi-solid, or soft food?	**TIMES** [___|___] 98 = Does not know	
12	Yesterday, during the day or at night, did [NAME CHILD] drink anything from a baby bottle?	Yes ..... 1 No ..... 0 Does not know..... 8	
13	Yesterday during the day or night, is what [NAME CHILD] ate food in baby food jars, cereals or other boxed or bagged foods special for baby (Ex Riri) etc.?	Yes ..... 1 No ..... 0 Does not know..... 8	

21. COMMUNITY HEALTH WORKERS SERVICES

RESPONDENT: MOTHER OF "CHILD LESS THAN 2 YEARS"; OR MOTHER OF "CHILD 2-5 YEARS"; OR CARETAKER OF "CHILD LESS THAN 2 YEARS"; OR ANY WOMAN IN THE AGE GROUP BETWEEN 18 AND 49.

READ: Now I would like to know if a Community Health Worker has visited your household during the past 12 months.

Respondent's name and IDP
_____ IDP [___|___]
Name

1	During the past 12 months, have you been visited by a Community Health Worker from the Ministry of Health?	Yes .....1 No.....0 Does not know 8	→ **END** → **END**
2	When was the last time you were visited by a Community Health Worker?	MONTH [___|___] 01. January 02. February 03. March 04. April 05. May 06. June 07. July 08. August 09. September 10. October 11. Novmber 12. December	
3	How many times were you visited by a Community Health Worker, during the past 12 months?	**TIMES** [___|___] 98 = Does not know	
4	In the last 12 months, did a Community Health Worker recommend you to take your child for a medical check-up?	Yes .....1 No.....0 Does not know 8	→ **Q7** → **Q7**
5	Did you follow her advice and take your child for a medical check-up?	Yes .....1 No.....0 Does not know 8	→ **Q7** → **Q7**
6	Where did you go?	Health unit in village.....01 Health unit eleswhere .....02 Governomental Hospital .....03 Private Hospital .....04 Private Doctor .....05 Other **(SPECIFY) **96	

READ: Now, please tell me what did the Commuity Health Worker discuss with you during her last visit.

7	Did the CHW talk about preventive measures and care during pregancy (antenatal care)?	Yes .....1 No.....0 Does not know ……..……8	→ **Q 9** → **Q 9**

21. COMMUNITY HEALTH WORKERS SERVICES

8	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Health education during pregnancy ..... A Minor inconviniences during pregnancy and how to overcome these ..... B Nutritional needs for pregnant women ..... C Anemia during prenancy ..... D Other **(SPECIFY)** X	
9	Did she talk about what a natural childbirth is?	Yes .....1 No.....0 Does not know 8	→ **Q 11** → **Q 11**
10	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	The definition of a natural birth ..... A Real signs of childbirth ..... B Health education and awareness after childbirth ..... C Other **(SPECIFY)** X	
11	Did she talk about the period following childbirth?	Yes .....1 No.....0 Does not know 8	→ **Q 13** → **Q 13**
12	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Body changes experienced by women after childbirth (postpartum) ..... A Care and health education measures after childbirth (postpartum) ..... B Postpartum basic needs ..... C Warning signs during postpartum period .. D Physiological needs during postpartum period ..... E Minor inconvinieces during postpartum period .....F Other **(SPECIFY)** X	
13	Did she talk about family planing during the postpartum period?	Yes .....1 No.....0 Does not know 8	→ **Q 15** → **Q 15**
14	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	The benefits of family planning ..... A Access to family planning ..... B Other **(SPECIFY)** X	
15	Did she talk about care measures for newborn children and underweight children?	Yes .....1 No.....0 Does not know 8	→ **Q 17** → **Q 17**

21. COMMUNITY HEALTH WORKERS SERVICES

16	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Danger signs in newborn children ..... A Timing for starting breastfeeding ..... B Underweight children ..... C Care for newborn children (kagaroo mother care) ..... D Other **(SPECIFY) ..... X**	
17	Did she talk about feeding practices for children up to age 2 years?	Yes .....1 No.....0 Does not know 8	→ **Q 19** → **Q 19**
18	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Benefits of breastfeeding ..... A Common problems with breastfeeding ..... B The introduction of supplementary feeding C Other **(SPECIFY)** X	
19	Did she talk about growth and development of the child and vaccinations?	Yes .....1 No.....0 Does not know 8	→ **Q 21** → **Q 21**
20	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Growth trends for females and males up to the age of five ..... A Weight curve for males ..... B Weight curve for females ..... C Follow-up on motor and mental early development of the child ..... D Stunting ..... E Primary vaccinations .....F Other **(SPECIFY)** X	
21	Did she talk about diseases caused by food and malnutrition?	Yes .....1 No.....0 Does not know 8	→ **END** → **END**
22	Which topics did she discuss? Anything else? **RECORD ALL RESPONSES** **DO NOT MAKE SUGGESTIONS**	Correct methods for preaparing food to retain its nutritional value ..... A How to ensure access to safe and wholesome food..... B Diseases casue by malnutrition ..... C How to feed a child in case of diarrhea ..... D Other **(SPECIFY)** X	

Thank you for taking the time to complete this survey, we are very appreciative of the time you have taken to complete this important survey.

APPENDIX VII: ANTHROPOMETRY QUESTIONNAIRE

Agriculture and Nutrition in Rural Upper Egypt
ANTHROPOMETRY BASELINE SURVEY

LETTER OF INTRODUCTION

Read to father and mother/caretaker of the child(ren) (or household head and his wife):

Earlier today, our colleagues informed you about the details of the study and the purpose of our visit. We, [First Name, Family Name of Anthropometrist 1] and [First Name, Family Name of Anthropometrist 2], would like to measure the weight and height of [First Name, Family Name of the Child] [First Name, Family Name of Mother/Caretaker or Wife of Household Head]. For doing that, we use a regular weight scale and a height measuring board *(Anthropometrists: Show weight scale and height measuring board)*. If you wish, we will be happy to confidentially inform you about your (and your child(ren)'s) weight and height. Please let us know.
The weight and height measuring and the blood testing will take about 30 minutes.
Your (and your child(ren)'s) measurements and blood test results will not be disclosed to anyone. They will be kept strictly confidential. Your and your family's participation in this exercise is voluntary. You have the right to not participate if you do not want to. You also have the right to discontinue at any time. Not participating will not affect you or your family in any way.
The weight and height measurement results will be used to assess the health and nutritional status of farming families in Upper Egypt. Weight and height data of many individuals together will provide information on the proportion of people that are well-nourished and under- or over-nourished.

Do you agree to participate in this study?	Yes……..1 No ……0

Name and signature of enumerator _____
Date _____

	NAME | CODE
GOVERNORATE.....	_____ [__|__]
MARKAZ	_____ [__|__]
VILLAGE	_____ [__|__]
PRIMARY SAMPLING UNIT (PSU).....	[__|__|__|__]
HOUSEHOLD IDENTIFICATION NO. (HID)	[__|__|__|__]
FIRST NAME	_____
FATHER'S NAME	_____
FAMILY NAME	_____
MOBILE PHONE OF CONTACT PERSON.....	[__|__|__|__|__|__|__|__|__|__]
LANDLINE NUMBER FOR HOUSEHOLD OR ANOTHER MOBILE NUMBER WITHIN HOUSEHOLD	[__|__|__|__|__|__|__|__|__|__]
PERSON IDENTIFICATION NO. (IDP) OF THE RESPONDENTS.....	[__|__] [__|__] [__|__]
FIRST NAME, FAMILY NAME AND CODE OF THE ENUMERATOR 1	_____ [__|__]
FIRST NAME, FAMILY NAME AND CODE OF THE SUPERVISOR	_____ [__|__]

DATE OF VISIT	[__|__] [__|__] DAY MONTH
START TIME	[___|___][___|___] HRS MIN
END TIME	[___|___][___|___] HRS MIN
RESULT CODE	[___] _____

RESULT CODES
13 = COMPLETE
14 = PARTIALLY COMPLETE
15 = NO AVAILABLE RESPONDENT
16 = REFUSAL
6 = OTHER **(SPECIFY)**

1. CHILD ANTHROPOMETRY

Gov. [__|__] Markaz [__|__] HID [__|__|__]

FILL IN THIS SECTION FOR ALL CHILDREN FROM 6 to 59 MONTHS.

READ: Now, we would like to weigh children and measure their height. We will give you their weight and height right afterwards. The information will be kept confidential.

1	2	3	4			5	6	7	8	9
IDP OF THE CHILD **(IF there is no more children, write 0)**	NAME OF THE CHILD	GENDER OF THE CHILD	DAY OF BIRETH	MONTH OF BIRTH	YEAR OF BIRTH	IDP OF THE MOTHER/ CARETAHER	HEIGHT OF THE CHILD If height is not measured, record "999.9".	WEIGHT OF THE CHILD If weight is not measured, record "99.99"	MEASURE LYING DOWN OR STANDING UP	IS THE CHILD STILL BEING BREASTFED?
IDP	NAME	MALE FEMALE	DAY	MONTH	YEAR	IDP	HEIGHT	WEIGHT (**Kg**)	CODE	CODE
[___|___] **CHILD 1**	_____ _____		[___|___]	[___|___]	[__|__|__|__]	[___|___]	[___|___|___].[___] **Measure 1** [___|___|___].[___] **Measure 2** **IF THE DIFFERENCE EXCEEDS 0.6 CM, MEASURE A THIRD TIME** [___|___|___].[___] **Measure 3**	[___|___].[___|___] **Measure 1** [___|___].[___|___] **Measure 2** [___|___].[___|___] **Measure 3**	Lying down..... 1 Standing..... 2	YES ..... NO.....
[___|___] **CHILD 2**	_____ _____		[___|___]	[___|___]	[__|__|__|__]	[___|___]	[___|___|___].[___] **Measure 1** [___|___|___].[___] **Measure 2** **IF THE DIFFERENCE EXCEEDS 0.6 CM, MEASURE A THIRD TIME** [___|___|___].[___] **Measure 3**	[___|___].[___|___] **Measure 1** [___|___].[___|___] **Measure 2** [___|___].[___|___] **Measure 3**	Lying down..... 1 Standing..... 2	YES ..... NO.....

2. MOTHER'S ANTHROPOMETRY

Gov. [__|__] Markaz [__|__] HID [__|__|__]

FILL IN THIS SECTION FOR ALL WOMEN FROM 15 TO 49 YEARS.

READ: Now, we would like to weigh you and measure your height. We would like you to participate. We will give you your weight and height right afterwards. The information will be kept confidential.

1	2	3	4	5	6	7	8
ID OF THE MOTHER/ CARETAKER **(IF there is no more children, write 0)**	NAME OF THE MOTHER/ CARETAKER	AGE IN COMPLETE YEARS	HAVE YOU EVER BEEN MARRIED?	ARE YOU CURRENTLY PREGNANT?	DO YOU BREASTFEED?	HEIGHT OF THE MOTHER/CARETAKER	WEIGHT OF THE MOTHER/CARETAKER
IDP	**NAME**	**AGE**	**CODE**	**CODE**	**CODE**	**HEIGHT**	**WEIGHT (KG.)**
[___|___]	_____ _____	[___|___]	YES, CURRENTLY MARRIED YES, MARRIED BEFORE NO	Yes..... No	Yes..... No	[___|___|___].[___] **IF Not measured (999.9)**	[___|___|___].[___] **IF Not measured (999.9)**
[___|___]	_____ _____	[___|___]	YES, CURRENTLY MARRIED YES, MARRIED BEFORE NO	Yes.....1 No 2	Yes.....1 No 2	[___|___|___].[___] **IF Not measured (999.9)**	[___|___|___].[___] **IF Not measured (999.9)**

Thank you for taking the time to complete this survey, we are very appreciative of the time you have taken to complete this important survey.