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## PARTICIPATORY EXTENSION AND ADVISORY SERVICES (PEASS) AS AN EXTENSION APPROACH TO ACHIEVE FOOD SECURITY IN EGYPT: LESSONS LEARNED FROM 5 GOVERNORATES

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### ABSTRACT

The objective of this study was to investigate the possibility of implementing a PEAS approach that involves all service providers in integrated efforts to provide Small Producers (SPs) with need-oriented advisory services. The study is a qualitative study conducted in 5 Governorates in Egypt by a multi-disciplinary research team. Selected extension methods secured proper and timely application of best-fit practices in each agricultural activity. Qualitative data were collected from regional technical reports from the five Governorates. Results confirmed the possibility of implementing PEAS, to help SPs in proper and timely application of best-fit practices for promoting production, with positive impacts including SPs' strong willingness to be active partners through high participation in the implemented activities. However, several challenges were identified, including: lack of scientific information about different pests and diseases and the best-fit practices to avoid and control them, applying traditional bad agricultural practices, that have negative impacts on the quantity and quality of production. Lessons learned include: a) the importance of bringing different services providers together, in collaborative work. b) encouraging each partner to effectively contribute to help SPs to understand and properly and timely apply the best-fit production and marketing practices, c) securing reciprocal communication and constructive dialogue among all partners. Recommendations include: establishing partnerships among relevant stakeholders and service providers to facilitate and encouraging SPs to establish their own autonomous civil society organizations.

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### INTRODUCTION

Egypt is currently suffering from several challenges that are threatening the food security in the country. Among the most important challenges are the following: (a) the ever-increasing population, which exceeds 100 million (Maged, 2020), (b) the continually-shrinking per capita quota of natural resources, specifically cultivable land, since arable and fertile lands in Egypt are scarce and farming is limited to less than 4% of the total land area

(Abdel-Gawad, 2017). In 2016, the total agricultural land area was about 9.1 million feddans (3.8 million hectares)<sup>1</sup>, accounting for 3.82% of Egypt's area, (Abdelaal and Thilmany, 2019), (c) the scarce fresh water resources that are restricted to only 55.5 BCM meters from the Nile water flow, which indicates an

<sup>1</sup> Note: One feddan equals 1.038 acres or 0.42 hectares.

ever-decreasing per capita quota of fresh water, and, (d) the climate changes, with its expected negative effects, for example: decreasing the productivity of some major crops (18% in wheat and 11% in rice), (Mansour and Soliman, 2019).

Although Egypt has achieved considerably high rates of self-sufficiency in some basic food crops and commodities, such as rice and eggs, the country is still suffering from relatively low rates of self-sufficiency in several important food crops. For example, as reported by (Hassan, 2020), rates of self-sufficiency in wheat, maize and cooking oils, in 2017, were 42, 52 and 5%, respectively. Food insufficiency is aggravated by the ever-increasing food prices. According to the Economist Intelligence Over the five years (2014-2019), the price for the average basket of food goods has been tripled in Egypt.

Within the commitment of the Egyptian government to the Global Sustainable Development Goals (SDGs 2030), two important strategies were prepared for achieving these goals. The first strategy is the Sustainable Agricultural Development Strategy towards 2030 (SADS 2030) that put the vision: "To achieve a comprehensive economic and social development based on a dynamic agricultural sector capable of sustained and rapid growth, while paying special attention to helping the underprivileged social groups and reducing rural poverty." Among the objectives of SADS 2030 are: Achieving Higher Rates of Food Security in Strategic Goods as the main objective that can be achieved through promoting self-sufficiency in strategic food commodities, improving consumption patterns to improve nutritional standards and vital bodily functions, reducing pre- and post-harvest food losses, improving food quality and safety and improving social safety nets (Arab Republic of Egypt, 2009).

The second important strategy is the Sustainable Development Strategy of Egypt (SDS 2030) that have the vision of the new Egypt that will achieve a competitive, balanced, diversified and knowledge-based economy, characterized by justice, social integration and participation, with a balanced and diversified ecosystem, benefiting from its strategic location and human capital to achieve sustainable development for a better life to all Egyptians ([www.sdsegypt2030.com](http://www.sdsegypt2030.com)). These strategies, as reviewed by Abbas (2019), were oriented to achieve several objectives, related to food security, including: increasing production productivity through applying

newly improved crop varieties (such as short-life rice), minimizing the production and marketing wastes through supporting marketing extension, rationalizing food consumption through increasing consumers' awareness.

Extension and Advisory Services (EASs) could significantly contribute to achieving the objectives of both SADS 2030 and SDGs 2030. As reported by (Swanson and Rajalahti, 2010), the agricultural extension and advisory systems can play an important role in helping to achieve agricultural development goals, including: a) achieving national food security through technology transfer especially for staple food crops, b) improving rural livelihoods through increasing farm income by increasing the production of high-value products, especially among small-scale Farmers (primarily technology process innovations), c) developing the social capital by training farmers to organize into producer and community groups, and, d) improving natural resource management by training farmers to use sustainable natural resource management practices.

According to Christoplos (2010), extension is defined as systems that should facilitate the access of farmers, their organizations and other market actors to knowledge, information and technologies; facilitate their interaction with partners in research, education, agri-business, and other relevant institutions; and assist them to develop their own technical, organizational and management skills and practices.

The agricultural extension (also known as agricultural advisory services) plays a crucial role in boosting agricultural productivity, increasing food security, improving rural livelihoods, and promoting agriculture as an engine of pro-poor economic growth. Extension provides a critical support service for rural producers meeting the new challenges confronting agriculture: transformation in the global food and agricultural system, including the rise of supermarkets and the growing importance of standards, labels, and food safety; growth in nonfarm rural employment and agribusiness; constraints imposed by HIV/AIDS and other health challenges that affect rural livelihoods; and the deterioration of the natural resource base and climate change (IFPRI, 2019).

The participatory extension relies on strong relationship building and open communication between farmers, extension workers, researchers, interest groups and

policy-makers. The Egyptian government must properly establish and resource the pivotal role of VEWs within the extension system to meet its strategic aims of modernizing agriculture, developing food security and improving the livelihoods of rural inhabitants (Christoplos, 2010).

As reviewed by Kassim *et al.* (2018), since the extension system in Egypt was subject to a hiring freeze in 1984 following a government policy introduced amid a balance of payments crisis, the number of extension workers continued in decreasing rapidly; falling from 3,274 in 2011 to around 800 in 2014. Moreover, there is a conflict between the duties assigned to extension workers at the field level. Specifically, extension workers are also responsible for reporting illegal construction on agricultural land, which usually results in mistrust between farmers and extension agents.

New non-traditional institutional arrangements are needed to maintain the function of providing farmers with their demanded and needed EASs. Among these new arrangements are the more pluralistic and participatory extension systems. As reported by Abdel-Gawad (2017), the participatory approach has proven an effective Extension method in introducing new innovative farming technologies. There is a need to form a group of able professionals capable of aiding and training the Extension workers on the implementation of a participatory approach.

To identify some new demand-driven and participatory institutional arrangements for reforming the current extension organization, a recent study, (Nawar *et al.*, (2019), explored farmers' preferences of the institutional reform scenarios of providing agricultural extension services in three Governorates representing different agro-ecological zones of Egypt (namely, Sohag, Kafr El Shiekh and Sharqiea Governorates). These scenarios were: (1) Strengthening the current Public Agricultural Extension Organization (PAEO), (2) Privatization of the agricultural extension organization, and (3) public Private Partnerships (PPPs) between the public Governmental and private sectors. The study found that the majority of the respondents (67.4%) prefer the first scenario of Strengthening the current PAEO. The third scenario (establishing PPPs between the public governmental and private sectors came in the second rank of the preferences (28.5%) while the second scenario of privatization was not accepted by the majority of respondents.

Participatory extension, as defined by the USAID Glossary, (2015, p 4-5), is essentially a combination of technology transfer, advisory services, and human resources development and involves two key elements. The first element emphasizes the fact that all types of farmers, especially small-scale and women farmers must play an important role in setting extension priorities and shaping extension programs. By so doing, farmers will take more "ownership" over these ongoing extension programs and operations. The second key element of the participatory extension approach generally encompasses more participatory extension methods, such as experiential learning and farmer-to-farmer exchanges. Participants are expected to make their own decisions, especially about how they will intensify and/or diversify their farming systems.

Within the Ministry of Agriculture and Land Reclamation (MALR), the Central Administration of Agricultural Extension and Environment (CAAEE), is conducting several activities to enhance food security in rural Egypt. As reviewed by Elshafie (2019), these activities include: planning and implementing different extension programs to achieve the maximum production efficiency from the production unit, conducting demonstration fields for plant and animal production, where all the best-fit technical recommendations are applied to convince farmers and animal growers to adopt them, utilizing multi-media and audio-visual aids for enhancing the diffusion of scientific-technical recommendations among agricultural producers, and establishing extension and rural development centres to work as effective mediums for meeting and training rural families.

As reported by Shalaby (2019), although agricultural extension in Egypt is facing human and physical constraints, it can effectively contribute to bridging the food gap through effective collaboration with research that help in finding scientific solutions for immediate agricultural problems coping with small producers' real conditions. This collaboration should include the adaptation of the new technologies to fit the local conditions, and preparing producers for understanding, timely and proper application of these technologies.

The "Participatory Extension and Advisory Services (PEASs)" as an extension approach to contribute in the provision of food needs in Egypt", was a research project funded by Cairo University and implemented in 5, out of the 27, Governorates, of Egypt, namely: Giza, Sharkia,

Dakahlia (in the Nile Delta), South Saini (in Sini Peninsula), and New Valley (in the Western Desert). As shown in figure (1), these Governorates represent different geographical locations and, in turn, highly diversified agro-ecological zones.

The main objective of this study was to explore the possibility of implementing a more pluralistic extension and advisory approach that combine and actively involve all development actors, service providers and partners in a collaborative, coordinated and highly integrated effort to provide small farmers and producers with their needed and demanded PEASs (information, advice and services). Among other inputs of sustainable agriculture PEASs is considered as an essential input that should be made available to small producers to improve their performance of the best-fit, research-based, recommendations and practices to enhance the production and productivity of important crops and activities.

## **MATERIALS AND METHODS**

This study is a qualitative study conducted by a multi-disciplinary research team including representatives from relevant stakeholders (agricultural research, education and extension institutions), in addition to local community leaders (farmers and producers' representatives), responsible for providing PEASs to small producers worked in the planning, implementation, monitoring and evaluation of the project activities in the 5 Governorates. In addition to the MALR personnel (from Directorates and administrations of agriculture from the 5 Governorates, the following educational and research institutions were participating in the project activities: Faculty of Agriculture, Cairo University - Giza Governorate, Faculty of Agriculture, Zaqaziq University, Sharqia Governorate, Faculty of Agriculture, Mansoura University, Dakahlia Governorate, Faculty of Agriculture, Assiut University – the New Valley Branch, the Desert Research Center – and its experimental Stations.

As shown in Table (1) and Figure (1), PEASs were provided to farmers and producers in the 5 Governorates of Egypt, namely: Giza, Sharkia, Dakahlia, South Saini, and the New Valley. These Governorates represent highly diversified geographical sites and agro-ecological zones. The food security-oriented crops and activities were selected based on the relative advantage and potential improvement of each crop or activity, by

the participatory research team in each Governorate. These crops and activities include: the safe raising of domestic poultry, promoting wheat productivity and promoting onion productivity (in Giza Governorate); promoting maize productivity, promoting onion productivity and promoting aquaculture productivity (in Sharqia Governorate); promoting food processing, promoting potatoes productivity dairy cattle productivity (in Dakahlia Governorate); promoting potatoes productivity and promoting maize productivity ( in South Sini Governorate) ; promoting maize productivity and promoting date palms productivity (in the New Valley Governorate). A total number of 1075 farmers and producers ((250 Females / 825 Males)) were targeted and covered by different PEASs' activities in the 5 Governorates (Table 1).

The application of PEAS in this project was based on collaboration and partnership among different production and marketing systems necessary for providing local small agricultural producers with comprehensive and integrated packages of technical information and best-fit recommended practices. Proper and timely application of these practices could lead to increased production and productivity in addition to improving the quality of products, and, in turn, achieving better levels of food security in the selected areas of agricultural production and marketing. Packages of recommended practices were provided to the small producer's categories, targeted by the project, by technical committees of local experts from all relevant stakeholders. Those stakeholders included: Regional Faculties of Agriculture, Regional Agricultural Research Stations, Regional Directorates and Administrations of Agriculture, Desert Research Centre and its Regional Stations, Local Extension Personnel, Central Lab for Aquaculture, Local Veterinary Experts, in addition, Local Community Leaders. Local technical committees were responsible for planning, implementing, monitoring all activities, including preparation of extension educational material, for extension workers, extension leaflets for producers, conducting administrative meetings for local teams of work in addition to extension meetings for producers.

Communication methods and channels were utilized to secure the delivery, sharing and exchange of information and advices, and proper and timely application of the recommended best-fit practices, among small producers, namely: workshops and training sessions for the

extension personnel, extension meetings with groups of producers, regular (or requested) visits to farmers' fields, demonstration farms, farmers' field schools, in addition to interactive communications, through mobile phone calls, among SPs, agricultural researchers and technicians. Technical reports about the results of each

activity, written and presented by regional team leaders, and discussed in regular meetings of the research team, were the main source of data and results. Qualitative data were analysed using descriptive way based on technical reports by describing the implemented activities and its impacts on small producers.



Figure 1. Map of Egypt, The five Governorates marked in Green.

Table 1. Locations, areas, time duration and targeted categories of PEASS'.

Location of PEASS' Activities Governorate	Village/ District	Type of Agricultural Crop / Activity	Time Duration	No of Targeted Farmers / Producers
Giza	Meet Ralhina	Safe Raising of Domestic Poultry	6 Month	50 Female Domestic Poultry Growers
	Meet Ralhina	Promoting Wheat Productivity	6 Month	100 Farmers
	Shabramant	Promoting Onion Productivity	6 Month	100 Farmers
Sharqia	Belbis	Promoting Maize Productivity	6 Month	20 Farmers' Demonstration Fields
	Zaqaziq	Promoting Onion Productivity		100 Farmers
	Zaqaziq	Promoting Aquaculture Productivity	6 Month	100 Aquaculture Producers
Dakahlia	Belkas	Promoting Potatoes Productivity	6 Month	200 Farmers
	Sherbin	Promoting Dairy Cattle Productivity	6 Month	100 Farmers (50 Women and 50 Men)
South Sini	Al-Tor	Promoting Food Processing	6 Month	100 Rural Women
	Al-Tor & Ras Sedr	Promoting Potatoes Productivity	6 Month	50 Farmers
	Ras Sedr	Promoting Maize Productivity	6 Month	50 Farmers
The New Valley	Barees	Promoting Maize Productivity	6 Month	30 Farmers
	El-Kharga	Promoting Date Palms Productivity	6 Month	25 Farmers
Total Number of Targeted Small Producers				1075 (250 Females / 825 Males)

## RESULTS

Results, based on the technical reports about each activity, could be summarized in the following four themes:

### 1) The possibility of implementing the pluralistic participatory extension approach:

During the application of PEASs' activities, the regional teams of experts including representatives from all regional agricultural research, educational institutions in addition to local directorates and administrations of agriculture were working collaboratively to help small producers in understanding, proper and timely application of scientific packages of best-fit practices relevant to the selected areas of agricultural production and marketing activities. These scientific packages were simplified and provided to the targeted categories of small producers (females and males) to improve their performance of agricultural production and marketing operations to produce more quantities and better qualities of food, and in turn, contribute to enhancing regional food security. The project activities were implemented in five highly diversified agro-ecological zones of Egypt (Figure 1).

### 2) The impacts of the research activities on SPs:

The application of the PEASs' approach in the five Governorates, revealed the following observations:

1. One of the most important, positive and observable impact of the project was that the small producers in all the selected locations demonstrated relatively strong willingness and enthusiasm to be active partners in different sequential communication and educational interventions conducted by the regional teams of experts.
2. Small producers' participation, contribution and involvement in the majority of the conducted activities were considerably high. This reflects the small producers' strong need for information and advisory services and readiness to learn and acquire new agricultural information, knowledge and skills.
3. The positive impacts of the research activities could be attributed to effective interpersonal communication, informal and friendly handling by the regional teams of experts, who showed high readiness and devoted sufficient time and effort, to serve and help small producers.

### 3) Challenges facing the successful application of the PEASs activities:

Several challenges were identified, by the local expert teams, through extension meetings and workshops, interpersonal communication and field personal observations during the implementation of different activities. Among the most important of these challenges were the following:

- 1) The majority of the SPs in the project areas lack sufficient scientific information about different pests and diseases and the best-fit practices that could be applied to avoid and /or control them.
- 2) The majority of the SPs in the project areas were used to applying several traditional bad practices, which represent inherited habits or customs that have negative impacts on the quantity and quality of production. Examples of these bad practices, (in maize production), are:
  - I. Decreasing the intensity of cultivated plants (number of plants per cultivated area), since they keep around 24000 plants / Feddan. This is an inherited habit which is against the potentials of new maize varieties (such Pioneer 3444 Variety), that accepts increasing the numbers of plants from 24000 to 35000-40000 plants / feddan, and, in turn, increase the crop productivity,
  - II. Utilizing over doses of Nitrogen fertilizers which is against the recommended doses.

This result could be interpreted through the high speed of agricultural information and technological advancements and the small producers' disability to cope with them because the majority of them are from relatively old age categories in addition to their lack of access to sources of agricultural information. This result also confirms the importance of the vertical flow of agricultural information (from research and extension workers to farmers) in addition to horizontal information diffusion among farmers (Farmer to Farmer Extension).

### Lessons learned

Several lessons and keys of success were concluded from the sequential communication and educational interventions conducted in the selected locations. The first important key of success of applying the PEASs was: "Bringing different stakeholders and extension services providers together", in collaborative activities where

each partner could perform and offer the best of his roles and services. Providing opportunities and situations for different partners, including small producers, to work together in an informal and friendly environment facilitated collective thinking, decision making and actions needed to satisfy small producers' needs and developed an attitude of project ownership among all partners. This collaborative work was reflected on direct economic and social impacts.

Among these impacts are the following examples: A) increasing the income of safe raisers of domestic poultry (50 females in Meet Rahina village, Giza Governorate) through selling considerable proportions of their products in addition to securing their domestic consumption needs of poultry. B) increasing wheat productivity (10% to 15%) among wheat growers (100 male farmers in Meet Rahina village, Giza Governorate). C) increasing onion productivity (around 10%) among onion growers (100 male farmers in Shabramant village, Giza Governorate and 100 male farmers in Zaqaqi District, Sharqia Governorate). D) increasing potatoes productivity (around 20%) among potatoes growers (200 male farmers in Belkas District, Sharqia Governorate and 50 male farmers in Al-Tpr and Ras Sedr Districts, South Sinai Governorate).

Among the observed social impacts of the project activities were the considerably high satisfaction of all the partners, for example, farmers and producers express their thanks and gratitude to the members of the research teams through happy-looking faces, smiles and warm welcome appreciations. On the other hand, the members of the research team were expressing their enthusiasm and satisfaction for their success in linking research with farmers and producers reflected in positive feedback and attitudes in addition to active responses and collaboration. The second key of success was based on encouraging each partner to effectively contribute to help SPs to understand and properly and timely apply the best-fit production and marketing practices. This was facilitated by a friendly work environment, initiated and maintained by the regional teams' leaders.

This environment was encouraged by mutual respect among different partners in addition to a strong empathetic tendency among all partners to understand and appreciate each other. The third key of success was based on securing reciprocal communication and constructive dialogue based on effective information

delivery, sharing and exchange among all partners. Securing highly effective contribution of the PEASs communication and educational interventions was based on the need to help small producers understand and properly and timely apply the best-fit production and marketing practices. Therefore, creating an effective utilization of direct communication links with small producers. Mobile phone calls, regular extension meetings, field and office visits demonstrated relatively high impacts to keep small producers well informed and capable of understanding and properly applying different best-fit practices provided by regional researchers and extension workers. The fourth key of success was based on motivating small producers to apply the recommended scientific best-fit practices through providing them with an in-kind incentive (such as free improved seed varieties and /or nitrogen fertilizers). This was justified by the fact that the majority of small producers are poor farmers with very limited financial resources to afford their access to relatively high cost and expensive practices or inputs (such as new improved seeds or fertilizers).

#### **CONCLUSIONS AND RECOMMENDATIONS**

Based on the results of this project, two recommendations could be suggested to improve the current and future extension programs, projects and activities. The first recommendation is establishing partnerships among relevant stakeholders and service providers to provide small producers with their needed and demanded extension and advisory services. These partnerships should be based on contractual farming for the production and marketing of different agricultural products. They could involve different agricultural extension and rural development actors including civil society organizations and the private sector. The government should play its important roles in supervising the whole activities, training and licensing extension personnel, protecting small producers' rights, quality control and judging and disagreement or disputes among the different partners.

The second recommendation is encouraging small producers to establish their own autonomous civil society organizations, under the name they select (such as: producers' organizations, community-based organizations, non-governmental organization, farmers' association). Small producers' groups could aggregate the individual powers of individual producers, facilitate

their access to their needed and demanded PEASs, and improve SPs' bargaining and negotiation powers.

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