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THREATS AND CHALLENGES TO SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT IN EGYPT: IMPLICATIONS FOR AGRICULTURAL EXTENSION

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ABSTRACT

Egypt is an agricultural based country. Its development primarily depends upon rural resources. Agriculture contributes approximately 14% of the GDP and absorbs about 31% of workforce. About 53% population lives in rural areas where directly or indirectly their livelihood depends upon agricultural sector. Despite its positive and significant contributions to food security/supply, economy, employment, export earnings, ecological balance, yet the agriculture of the country faces many threats and challenges which, in turn, impacts rural development initiatives. The prominent challenges include land and water issues; old cultivation techniques; lack of information on marketing; poverty; degradation of natural resources and environmental issues; population growth; inadequate support services; framework and institutional constraints; and lack of agricultural and rural development policies. In this article, an effort has been made to identify the constraints faced by the agricultural sector, discuss the available farm management options, and to outline the vibrant strategy backed by an efficient and effective Extension to realize sustainable yields and rural development in the country.

Key words: small landholdings, agricultural production, population growth, limitations and stresses, agricultural extension and rural development.

INTRODUCTION

Egypt spreads over an area of about 1.0 million km^2. However, agriculture is practiced on an area of about 8.0 million feddans[1] (about 3.5 million ha), including recently reclaimed lands (Abdelhakam, 2005). As a heavily populated country with the population of 83 million, Egypt is an agricultural based country. Agriculture remains a major sector and very vibrant component of the economy. Although its performance remained relatively modest in the last many years, it has successfully attracted substantial investments (Global Arab Network, 2009). Agriculture employs about 31% of the labor force (Kruseman and Vullings, 2007) and some 14% of the GDP is generated by agricultural production (Morgan, 2010). Due to the favorable agro-climatic, perennial water supplies and rich fertile soils in the Nile valley, Egypt produces a variety of agricultural crops, vegetables and fruits to feed its own population and earn foreign exchange through exports (Ministry of Agriculture, 2011). The country's main crops include cotton, wheat, rice, sugarcane, beet, fodders, clover, vegetables, peanut, sesame, sunflower, lentils, beans and onion, and fruits such as citrus and dates (Ministry of Agriculture, 2011). To enhance and realize maximum yields from cultivated lands, many farmers grow double-planted crops using their lands to produce more than one crop a year. Currently, greenhouses have also been introduced on new lands for producing new and high value crops on reclaimed lands (Abdelhakam, 2005).

The agricultural sector, including irrigation and fishing, witnessed a growth of 3.1 percent in 2008. In the face of a global economic downturn, Egypt has further improved its agricultural policy to support the key commodities. Yet, the productivity of the most important crops, such as wheat, declined in 2008 (Global Arab Network, 2009). However, while the country has made remarkable progress and the government's efforts to support the country's strategic crops are encouraging, the agricultural sector still suffers several weaknesses and faces many threats. The prominent threats include: growing population, water security, little or no use of modern farming technologies, low farm mechanization, and the division of land into small farming units (Global Arab Network, 2009). Realizing the importance of these factors, the Egyptian government has launched corrective measures like the setting up of 470 agriculture related industries dealing with the products and by-products of agricultural crops; dried and frozen vegetables; edible oils, poultry and juices etc (Global Arab Network, 2009).

However, the agricultural sector still faces structural weakness and at present only 3.5% of Egypt's land qualifies as agricultural land. Weak infrastructure increases the cost of transportation for farmers and drought represents a perennial threat, which is compounded by poor irrigation (Morgan, 2010). The country remains dependent on the importation of key

[1] Feddan is a unit, used in Egypt to represent area/land mass and one feddan is equal to 0.46 hectare.

commodities which are essential to meet the demands of Egypt's growing population. Abdelhakam (2005) also notes that improved agricultural practices are being introduced to cultivate the new reclaimed lands; such practices include modern irrigation systems, organic farming and integrated pest management. At this juncture, it is important to identify the shortcomings and constraints associated with the Egyptian agriculture, review the initiatives taken by the state to address the issues and suggest suitable options to adopt to realize sustainable agriculture and rural development. In this article, an effort has been made to examine the role of agriculture in realizing the rural development in the country. Also, various strategies have been outlined to improve both these seemingly inseparable sectors.

An Overview of Agricultural Sector: For many centuries, agriculture has remained one of the major sectors of the Egyptian economy. No doubt, industrialization received greater attention in the recent years, yet the country continues to depend largely on agricultural production. About 31% of labor is engaged in the agricultural sector and it contributes 15% towards the GDP (El-Din, 2007). The country is ambitious to initiate horizontal expansion to increase agricultural by increasing cultivation areas through reclamation of new lands in the desert. This particular practice would not only increase cultivated areas but would also cause an influx of population, meet the food requirements of growing population, and create jobs for young graduates, especially when the per capita cultivated area has decreased. In addition the country plans to enhance vertical expansion by raising the average production per acre to narrow a constantly increasing food gap. Since farmers are either not buying or are unable to buy fertilizers, most of the production is organic and is directed to export markets. Irrigation in the new lands depends on groundwater and wells. Egypt produces many agricultural crops, both for the local consumption or for export. Alfalfa, onions, beans, wheat, barley, sugarcane are the most important winter crops, whereas rice, sugar beet, cotton and maize are the most important summer crops. In addition, the agricultural sector in Egypt is famous for producing appreciable quantities of vegetables and fruits such as tomatoes, melons, citrus, guava, and date palm (Ministry of Agriculture, 2011).

Among the strategic agricultural crops, wheat ranks number 1 for its highest consumption (Global Arab Network, 2009) in the country. Its output has increased by 10.1 percent to 8.0 million tons in recent years. Growth in wheat production was the result of an international increase in crop prices early in 2008. Many farmers chose to plant wheat due to price hike. The cultivated area increased by 7.5 percent, spreading over about 2.9 million feddans. However, area planted to wheat shrinks whenever there is a drop in international wheat prices. In such a situation, the government always intervenes to support the sector by purchasing part of the harvest at prices much higher than the international rates. Yet, farmers consider the procurement prices not high enough to offset costs. They become discouraged and shift cultivation to other more profitable crops, a trend which increases the country's dependency on wheat imports that provide for half the consumption (Global Arab Network, 2009).

Rice another major staple ranks number 2 and is regarded the most profitable export crop of summer season. The country reported a 2.3 percent growth in production to a total of 6.9 million tons in 2008 as a result of a 5.6 percent expansion in productive land. The increased rice cultivation that has been the result of a hike on international markets has increased pressure on water resources since rice cultivation is exceptionally water intensive (Global Arab Network, 2009). For enhancing a rice farmer's income, Abdelhakam, (2005) suggested they practice fish-culture in rice fields as it has successfully provided fish harvest in Nasr Lake and other areas of the country. In 2008, due to water management policy, the limits were imposed on the area to be brought under rice cultivation but policy proved ineffective. Therefore, the government placed an export ban in order to lower the domestic price of rice. The lifting of the ban has allowed exports to increase again, and to benefit from the high international prices of the commodity. Rice Cultivation also helped farmers to realize higher profits as compared to other traditional summer crops (Global Arab Network, 2009).

Per capita consumption of sugar in Egypt is quite high as population growth further fuels the demand. Sugarcane with its production of 16.8 million tons in 2008 is therefore another strategic crop for Egypt. Sugar beet production also contributes to the Egyptian sugar industry, but its production declined as the area under this crop also declined. The state has supported the sugar crop, by buying the harvest, imposing duties on imports and trying to reduce the dependency on imports. Realizing the importance of the crop, the country has decided to invest in the sector in the years to come (Global Arab Network, 2009).

Egyptian cotton enjoys an excellent reputation worldwide for its high quality; therefore, it is considered an equally important crop in the country. Although the cotton industry is well developed and quite productive, yet still faces many difficulties. Feddans planted to cotton are decreasing and consequently the production has also been declined. Despite the modest increase in output, the very short-term outlook for the crop does not seem promising. Farmers are increasingly losing interest in cotton production because of high input costs and because it is sensitive to international economic downturn as a result of its forward linkages with the textile industry. To boost and enhance cotton cultivation, the

government announced farmer friendly policy in 2009 to support the textile industry and to buy yarn produced from Egyptian cotton at a high price (Global Arab Network, 2009).

An overview of agricultural sector presented in the section clearly indicates that most of the strategic crops are under stress and the farming sector needs to make certain changes and adjustments in the production systems. The government can certainly assist by formulating and implementing farmers' friendly policies depending upon the situations. A suitable strategy at the farm level placing high emphasis to popularize and adoption of the concepts and principles of sustainable agriculture is needed at this time (Ministry of Agriculture, 2008).

Relationship between Sustainable Agriculture and Rural Development: The goal of both sustainable agriculture and rural development is to increase food production in a sustainable manner, ensuring and enhancing food security and improving livelihoods in rural areas. In order to realize this goal, efforts should be made towards educational programs, efficient utilization of economic incentives and the development of appropriate and new technologies. Such efforts will ensure stable supplies of nutritionally adequate food, employment and income generation to alleviate poverty, and protect natural resources and environment as well. However, conserving and rehabilitating the natural resources on marginal or lower potential lands in order to maintain sustainable man/land ratios is extremely important (Kruseman and Vullings, 2007).

Threats and Challenges in Agriculture and Rural Areas: The agricultural sector and rural areas of Egypt are faced by many threats and challenges. High pressures and strains on the country's economy have resulted in poor or weak infrastructure and have pushed rural people deeper into poverty. In the situation, the majority of the people is forced to live in poor living conditions and is deprived of basic facilities of life (Mohammed, 2005). A detailed account of threats and challenges prevailing in the country is presented next.

Small and Fragmented Landholdings: Small landholdings characterize Egyptian agriculture (Aquastat, 2005). Farmers in Egypt have small landholdings and fragmented land ownership. Some 80 % of the total landowners own agricultural lands less than or equal to 5 feddans (Kruseman and Vullings, 2007). According to Aquastat (2005) about 50% of all landholdings cover an area less than 0.4 ha (1.0 Feddan). An imbalance between the cultivation of high value crops and strategic crops (cotton-wheat-rice-maize) prevails in the country. About 80% of the crops are not rated high enough quality to qualify to be shipped to the export markets. Exporters do not buy crops and commodities with poor quality. Therefore, they are supplied to the local markets. Old and traditional cultivation methods are still in practice, resulting lower yields than can be realized on new lands by employing advanced modern scientific principles, new cultivation techniques and better farming practices.

Natural Resources and Environmental Problems: Natural resources, including land, water and the environment, are deteriorating in the country due to natural processes and anthropogenic activities. The prominent constraints include a fragile land-base, declining soil fertility, increasing salinity content of the soil and water, limited water resources, and frequent climatic shocks. The natural resources base is also deteriorating due to burgeoning population pressure, inappropriate agricultural practices, overstocking, deforestation and consequent upon the soil erosion, and destruction of habitats for wild fauna. The environment is under severe stress, biodiversity is vanishing. Irrigation waters have been contaminated at several points with pollutants which will in turn adversely affect the land qualities.

Land Issues: Civil construction and sprawling are consuming fertile lands. Farmland urbanization poses a serious threat to Egyptian agriculture (Aquastat, 2005). Land degradation, particularly in the rainfed and irrigated areas, can be noticed. Land productivity is also on decline due to land degradation issues and processes like: salinization of irrigated areas; water logging and wind and water erosion. Farmers have inadequate access to productive resources, particularly agricultural lands. They face difficulties in expanding the cultivated areas (Kruseman and Vullings, 2007). About 80 percent of the land affected by salinity and waterlogging has been successfully reclaimed and made productive. In the country, drainage systems have been installed within saline areas. This has led to a reduction in saline areas from about 1.2 million ha in 1972 to 250 000 ha in 2005. In the northern part of the Delta, available groundwater turns brackish to saline due to seawater intrusion. Almost half of the Delta contains brackish to saline groundwater (Aquastat, 2005).

4 Water Shortage and Drought: Water shortages are aggravated by the way water is utilized. Water is often used wastefully, unwisely and inefficiently in agriculture, as well as by the municipal, industrial and commercial users (WHO, 2003). Water losses in irrigation are enormous. In Egypt there are areas that receive enough water to practice modern agriculture while other areas suffer from drought and water shortage. Present farming systems are unable to cope with drought and water shortage and the country lacks enough suitable farming technologies that could adjust the cropping systems/patterns in various zones according to the availability and supply of water. Therefore, farmers need

to shift to crops that require less water, such as wheat and cotton.

Water in the Rural Areas: About 56% of the households in rural areas receive water from a piped, public system. This figure also includes those users receiving their water from public standpipes or neighbors connected to the public system. Throughout the country, the level and quality of service vary considerably. Of the 4,215 main villages, only 38% or 1,607 villages receive sufficient water. About 56% or 2,368 villages receive insufficient water whereas only 6% or 240 villages do not have access to water systems at all (Sharabas, 2003).

Water for Agriculture: Egypt depends largely on Nile River water for its agriculture. Rains are not sufficient and effective enough to depend upon for production. Rain-fed agriculture is practiced in only 2% of the total area. The Egypt's quota of Nile water is 55.5 billion cubic meters. Combined with other sources, there is a total available of 63.5 billion cubic meters. The per capita rate is nearly 850 cubic meters a year - under the water scarcity - whereas the minimum should be per capita needs to one thousand meters cubic meters. Egypt is among 35 water deficit countries in the world. In Egypt 87.7% of the total water is being consumed by agriculture, 5.4% by industry while the total human consumption touches the figure of 6.8% of the total water (Shalaby, 2005).

For the irrigation of the new land, each drop of water has become the focus of the state in Egypt. Efforts are being made to focus in the future on the development of irrigation systems, the introduction of real irrigation technologies that could be successfully employed to irrigate the newly reclaimed agricultural areas. Modern irrigation methods such as sprinkler and drip irrigation need to be applied to overcome the water shortage and scarcity. The irrigation technologies would lead to the production of crops of high quality for export (Elgandy, 2001).

Poverty: In 1997, 26.5% population was living in poverty. In rural areas, 29% population was living in poverty. The poverty rate in rural area is higher than urban areas (Aquastat, 2005). According to Aquastat (2005) “ultra poverty” was highest in Upper Egypt, while a larger absolute number of poor households were found in Lower Egypt because of the concentration of population. Some 10.7 million poor live in Egypt. Poverty is predominantly a rural phenomenon as 70 percent poor live in rural areas. Poverty varies significantly among rural and urban areas and from region to region. Rural poor people typically include tenant farmers, small scale farmers, landless laborers, unemployed youth and women. Aquastat (2005) stated that inadequate social services, landlessness, small farm size and inadequate off-farm income opportunities are among the major causes of rural poverty.

Education: Certain social and cultural customs allow men to seek education whereas women are deprived. Generally, educational facilities for general public, particularly for rural areas, are not sufficient. Therefore, inadequate access to education results in an illiteracy rate in rural Egypt of 36.6% (El-Din, 2007). Additionally, high illiteracy rate and poor skill levels are observed, particularly in rural women. Rural dwellers do not have enough awareness of concepts and principles of sustainable agriculture. They lack knowledge on exportable markets. Due to the shrinking job opportunities in the rural areas and farming sector, farmers not only experience difficulties finding qualified and skilled agricultural laborers but they also have to pay them more.

Sanitation: Improved and safe drinking water facilities are basic human needs however, these are only available to about 96% of rural population and 99% of the urban population with an average of 97% of the total population of the country (Aquastat, 2005). Sanitation facilities in the rural areas are poor with about 52% of the rural population having access to improved sanitation in the year 2006 (Kruseman and Vullings, 2007). However, today the sanitation facilities in the country seem satisfactory as almost 100 percent of the urban population and 96 percent of the rural population had access to improved sanitation, with an average of 98% of the total population (Aquastat, 2005).

Health and Nutrition: Poor health, malnutrition, and high family growth-rates are quite common in rural areas. Similarly, maternal and child health are a continuing challenge. Maternal and child malnutrition and rates of infant, child and maternal mortality cases are reported as relatively high. In addition, healthcare facilities are not equally accessible to all particularly in rural areas. The rural areas have inadequate health information systems for monitoring communicable diseases and major health risks. Lack of nurses, paramedics, skilled birth attendants and health system managers indicates an imbalance health workforce with excess doctors and specialists prevails in the rural areas. The Arab Republic of Egypt needs to build and enhance its capacity for policy analysis and formulation at all government levels to support a devolved health system. Efforts are required to strengthen capacity of the health departments to regulate, support and build partnerships with the private sector.

Poor Rural Infrastructure: Weak rural infrastructure exists in rural Egypt and at the same time the rural households experience over-crowding and congestion (Morgan, 2010). In rural areas, the roads are poor and muddy pathways prevail in the suburbs making the life of the rural dwellers difficult.

Labor Force: At the moment, about 31% of the workforce is engaged in agriculture (Kruseman and Vullings, 2007). A productive labor-force is vital for agriculture and it is not available because the sector can no longer gainfully employ more youth. Due to increased migration from rural areas, there is a shortage of trained, skilled and qualified labor in the country and unfortunately the food producers/farmers themselves have become net consumers. Increased migration from rural areas to urban satellites, consequently social disruption and increased urban violence are being witnessed. According to El Laithy (2007) some 29% of the labor force work in agriculture and 43 of the labor force work in the rural Egypt work in agriculture. About 58% rural population is engaged in agricultural activities.

Employment Opportunities: Due to lack of intensification and diversification of the agricultural sector, on-farm (agribusiness) and non-farm entrepreneurship/self-employment opportunities are limited and becoming more scarce every day. Due to the non-availability of safety-net, social dislocations and distortions are rampant, skilled workers are migrating to the neighboring towns when unable to find employment. Unemployment rates in rural areas are declining. About 40% of the total income in rural areas is derived from agricultural sector (El-Deen and Ahmed, 2004).

Women Farmers, Children and Youth: Inequality based on gender is an important characteristic of the social and economic environment in Egypt even today. Men are preferred in many cases although women enjoy some of their rights in some cases. Women in poor families and in rural areas, account for 70% of the total poor in Egypt, especially those who are forced to live inferior lives due to the double discrimination of poverty and discrimination against women. Women, as an active labor force in the rural areas, suffer the most because of illiteracy, poor nutrition, poor health, high birth-rates and unacknowledged labor. Women own fewer assets, have limited economic options and less access to social services. Children, because of economic pressure, are compelled to leave their homes to seek employment and as such fall victim to child labor. Youth do not find ample facilities to be involved in healthy activities at leisure. They may get attracted by unhealthy activities and hobbies to during any free time (Ali, 2003; Shalaby et al, 2011).

Inadequate Support Services: Farmers find ineffective support services regarding the availability of farm inputs like seeds, fertilizers, and credit. They usually have inadequate access to basic farm services such as the Extension Services and technology transfer. Farmers are provided low-level technology. However, Extension in the country has poor organization and Extension service does not enjoy empowerment.

Poor Policy Framework and Institutional Constraints: In the country, agriculture and rural development policies are not considered farmer-friendly. For example, unequal land distribution and insecurity of land tenure exists. At the same time, low public sector investment in physical and social infrastructure in rural areas is made. Private sector participation in developmental aspects also seems quite low. There are few civil society organizations working at the grass-root level for the betterment of rural people. Factors like lack of organizational and institutional coordination make the Extension work weak and prevent realizing sustainable initiatives in rural development. In addition, institutional and organizational conflicts concerning developmental aspects, like gender imbalance and poverty, further enlarge the issues. The country has poor marketing and buying policies and market prices for some strategic crops are low. Information about the needs of exportable markets is not available to the farmers either through the government or Extension Service. An adjustment in agricultural, rural development, environmental and economic policy can improve the working of farming sectors and the livelihood of all farmers (Kruseman and Vullings, 2007).

Egypt is an agrarian based rural country and society. Agriculture has been an economic activity for the last many decades. Its rich cultural heritage is associated with its irrigated fertile lands. Unfortunately, despite of the remarkable progress made because of agriculture, rural areas remained under-developed and without an appreciable infrastructure. There is no doubt, that a good rural infrastructure can result reasonable rural development (Kruseman and Vullings, 2007). An overview of infrastructure indicates that more dedicated efforts needs to be made as presented in Table-1.

An Overview of Agricultural Extension in Egypt: The Agricultural Extension Service in Egypt transfers agricultural information primarily to the public sector with a small private sector component. Presently, the public sector Extension system is in a transitional phase in Egypt. The Extension system is moving towards decentralization of programming decisions and operations. Above all, the Extension service of the country not only focuses on agricultural performance but is also involved in community development initiatives (Rivera et al., 1997).

The Extension system plays a very significant role in enhancing agricultural production in Egypt. At present, the replacement of old practices with the new modern scientific farming technologies presents the main challenge for Extension. Despite, its good work on occasions, it is constrained by several issues and problems, limiting its efficiency and effectiveness (Shalaby et al., 2010). According to Abdelhakam, (2005) not enough qualified Extensionists are available to impact the remote areas. Extension workers lack transport

facilities and have low incomes. Poor and uncomfortable working conditions and harsh environment certainly lower the already low motivational level of many Extension workers. Therefore, better facilities, suitable rewards, achievable targets and increased budgets are needed to provide Extensionists in areas where they are facing shortage, especially remote areas.

Problems Associated with Agricultural Extension in Egypt: Currently, agricultural Extension activities are carried out through a one-direction transfer of knowledge, where farmers were considered recipients not participants. The prime issues include problems in Extension Service and organization, difficulties in bringing behavioral change of the farmers to adopt modern farming technologies capable of enhancing crop yields. The Extension workers lack proper education, technical skills and appropriate qualifications to undertake Extension activities effectively and efficiently. Improvement initiatives regarding the Extension workers' technical and communication skills would not only enhance the efficiency of the Extension staff but also would enable them to help farmers learn apply agricultural practices (Axinn, 2009).

Women play a greater role in the farming operations by their extensive participation in crop cultivation, pest control and harvesting in cotton production. Yet, capacity building programs are not available for women Extension Agents. Additionally, there is a lack of re-orientation to gender issues. Capacity building programs targeting Extension Agents, for improving their technical knowledge and enhancing their communication and facilitation skills are urgently needed Egypt. 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 providing assistance and to train the Extension workers on the implementation of participatory approach. The critical review of the projects on infrastructure launched with the help of the community by adopting participatory approach have resulted sustainability and the sense of ownerships as noted by the project designers and managers (Soliman, 2007; Shalaby et al., 2010).

Implications for Extension in Improving Agriculture and Rural Development: Recently, much development has occurred in crop production in Egypt, with some crops, such as rice, moving up in worldwide rankings of areas cultivated. This development is the direct result of efforts and planning that depend on specialized roles and tasks. Agricultural Extensionists' role is to provide advice on agricultural and animal production and to promote rural and environmental development. Therefore, the Extension worker is the main axis from which the development process expands (Abdelhakam, 2005). The above information leads to conclude that Extension has a significant role in addressing issues associated with the agricultural sector in addition to enhancing crop yields. Higher crops production can improve the rural infrastructure and livelihoods. By launching strong Extension programs and by adopting participatory approach, crop yields, profit margins and income levels can be enhanced. Such practices will result in the development of rural areas depend upon sustainable agriculture (Shalaby et al., 2010). Sustainable rural development is viewed as the product of sustainable agriculture in the developing world.

Agricultural Extension in Egypt not only focuses on increasing agricultural production and transferring modern agricultural technologies, but also undertakes many activities leading to rural development. Agricultural Extension exploits and explores all possible opportunities and resources and the potential of natural and human resources, delivers educational and awareness-raising programs and evaluates development capabilities to improve skills and ways of thinking. To this end, Extension enables rural people to take full advantage of scientific and technological advances in agriculture. These initiatives result in higher standards of living and elevate the social and economic status of the communities.

According to Shalaby et al., (2010) Agricultural Extension has the great potential achieving sustainable rural development by:

- providing the solutions to field-based problems by linking agricultural research;
- creating awareness, educating farmers to change their old traditional trends with friendly persuasion;
- developing community resources to reduce agricultural preservation by preventing destruction or pollution;
- enhancing agricultural productivity through increased efficiency of Agricultural Extension and the development of the productive process on the basis of scientific economic lines to increase production while reducing costs.
- improving the income of rural families by introducing crafts and rural industries, which rely on local products and thus provide employment opportunities for young people and the reduction of unemployment and poverty.
- attaching special attention to women and rural youth as a component of the presently available options for rural dwellers (Tonobi, 1998; Shalaby et al., 2010).

Conclusions and Recommendations: Despite many associated constraints, agriculture sector still remains a significant and prime contributor to the economy and development of Egypt. However under the existing set of limitations of small-holdings, labor intensive cultivation and farming methods, and traditional irrigation water application, the current small scale agriculture seems

under stress due to population growth, land fragmentation and low quality of life in rural communities. There is a need to increase agricultural production and to reduce land fragmentation. Currently, about 80 percent of the landholdings are smaller than 5 feddans in the traditional areas (El-Din, 2007) and the operational conditions for the farmers are quite harsh. Initiatives are needed to increase agricultural production while decreasing land fragmentation.

According to El-Sayed and Lashine (2007) Egypt has 10.7 million poor with 70 percent of them residing in rural areas. Policies adopted for the development of agriculture must also focus on poverty reduction in rural areas. Policy leaders need to address issues to evolve farming practices and technologies that would increase agricultural production to combat poverty.

To realize economic yields, it is recommended that these small landholdings must be cultivated with high value crops. To implement sustainable rural development, a workable strategy must have the following steps to follow:

- Make rural areas more attractive, capable of producing more valuable crops that could generate jobs to reduce and prevent urbanization.
- Farmers need to adopt "Good Agricultural Practices" (GAP); there is a need to create awareness and launch campaigns to make GAP popular.
- A significant challenge for the sustainable management of water resources is to control water pollution. Water remains a scarce commodity, therefore, its quality and quantity needs wise management and consumption.
- Strengthen rural organizations to address the poverty issues and to enhance rural income generations -- both within and outside agriculture sectors. Non-farm income generation sources needs to be investigated and implemented.
- Good Agricultural Practices (GAP) needs to be backed and supported by the Agricultural Extension in order to realize sustainable rural development.
- Attention of the government and its planners to provide facilities to promote agro-processing is needed in rural areas. Small-scale projects can enhance the economic value of agricultural products. Value-added products garner higher prices.
- Farmers and their families, if provided with technical and financial assistance, can improve the quality and production levels of their production. This can certainly create more export opportunities while at the same time protecting the environment.
- Villagers are slowly becoming consumers of agricultural products and commodities; they are losing their status of producers and suppliers of basic food items. Therefore, there is a need to convert villages as producers and to enable them to meet the food requirements of the cities by launching small-scale projects to make their farming economically viable and productive to attract them back to their villages and farming business.
- There is a need for scaling up diversification into new higher value crops; this can be achieved by the use of new and more efficient irrigation technology.
- For realizing real rural development and practicing sustainable agriculture, it is imperative to formulate vibrant agricultural, economic, environmental and rural development policies.
- Above all, there is a need to better coordination, cooperation and accommodate policies framed towards sustainable development.
- Egypt lacks sufficient suitable farming technologies to adjust the cropping systems/patterns in various zones according to the availability and supply of water. Therefore, farmers need to shift to the crops that require less water, such as wheat and cotton.

Agricultural Extension service can help in realizing higher yields and sustainable rural communities. Today, Extension activities are offered in a one-direction transfer of knowledge practice, where farmers are considered recipients not participants. However, the Agricultural Extension Services will have to move from supply-led information to information customized to a farmer's actual need (Shalaby et al., 2010). For example, Egyptian cotton production could be improved if Extension workers and farmers team up in a way that incorporates their needs and objectives.

There is a need to develop the capacity building programs for both the male and female Extension Agents, to improve their technical knowledge and enhance their communication and facilitation skills. Farmers might know about new "technologies" but often misuse them due to their inappropriateness application. Women extensively participate in almost all the farming operations -- from crop cultivation, pest control and harvesting to the sale or consumption of the product.

Together, the agriculture sector and Extension Service have a significant and positive role in achieving sustainable rural development. Projects and programs on sustainable agriculture based on scientific concepts and principles will improve rural livelihood. Hence, we conclude that effective agriculture management would lead to sustainable rural development.

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