



# Improving Food and Nutrition Security for Poor Urban Households:

The Case of Roof Gardens in  
Qena

Egypt Network for Integrated Development

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**Case Study 003**

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**Introduction:**

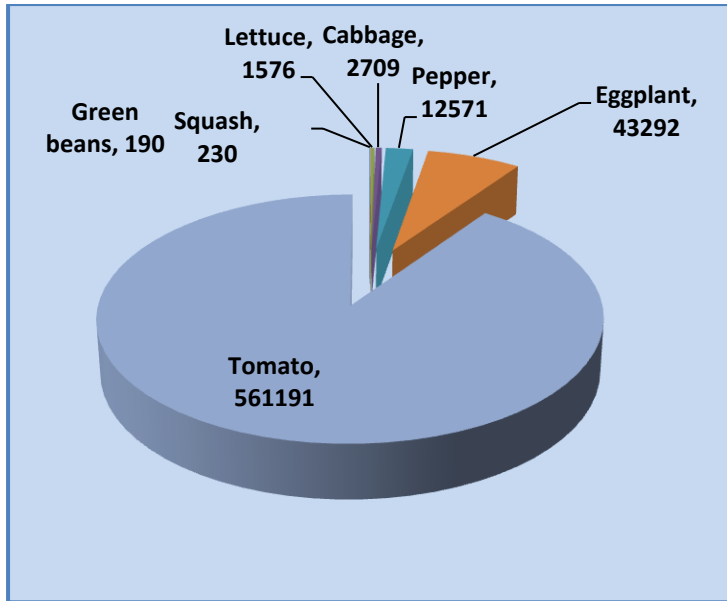
Sustainable agricultural development in Egypt is highly related to food and nutrition security, poverty alleviation and improving the livelihood for the poor. The Egyptian agricultural sector is the main productive source of the food security in Egypt. The 2010/2011 Income, Expenditure and Consumption Survey<sup>1</sup> indicated that the average household expenditure on food reached 39.9% from total expenditure. About 15% is devoted to vegetables. This percentage ranges from 16.2% in rural areas to 14.3% in urban areas. The food balance sheets for Egypt in 2009 indicated that the total per capita consumption for tomatoes reached about 116 k. gr/year, while daily intakes are estimated to be 57 k. gr cal. /day, 3.2 gr protein/ day and 0.6 gr fat/day. The total consumption of onion was estimated at 21.1 k. grams/year, producing 24 k. grams cal. /day, 0.8 gr protein/ day and 0.1 gr fat/day. The total consumption of the other vegetables is estimated at 96 k. grams/year with 61 k. grams cal. /day, 2.9 gr protein/ day and 0.4 gr fat/day, respectively. Thus, it is evidenced that the share of vegetables in the Egyptian food diet and consumption pattern is quite small. Qena governorate produces various vegetables during the three agricultural seasons (i.e., summer, winter and nili). The main vegetables produced are potato, tomato, eggplant, lettuce, pepper, squash, cabbage, water melon, carrot, cucumber, garlic, onion, green beans. Poor urban households consume very little vegetables and fruits and their main source for calories is cereals and particularly wheat.

The total production of the suitable vegetables of the roof garden plantation in Qena governorate is very low (figure 1). The population of Qena governorate reached more than 3.2 million in 2012. Therefore the total per capita consumption of the above mentioned vegetables is around 0.53 kg per day which is very low by all standards. So the roof garden plantation will directly improve the per capita consumption of the vegetables in Upper Egypt.

**Figure (1): Vegetable Production in Qena (Ton), 2012**

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<sup>11</sup>CAPMAS, Summary of Major Indicators of the Income, Expenditure & Consumption Survey 2010/2011.



### Existing Models

Many agricultural systems can be used in roof garden plantation. The main systems used are: Pot Trays (Figure 2); Deep Water System (Figure 3); Tables Beds (Figure 4); and Automated Intensive System with Pipes (Figure 5)

**Figure (2): Pot Trays**

**Figure (3): Deep Water System**



**Figure (4): Tables Beds**

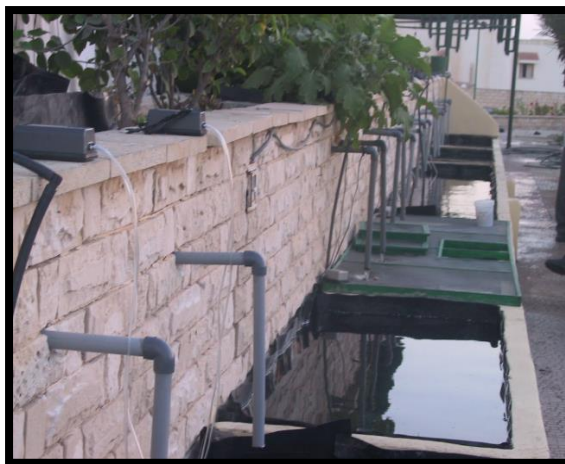
**Figure (5): Automated Intensive System with Pipes**



Recently, roof garden plantation is widely spread in different sites in Egypt because of social and economic advantages. The roof garden systems have been utilized in different places such as: (i) the roof of Borg El Arab Hilton Hotel in Alexandria (Figure 6), (ii) the roof of the aromatic plant cooperative (Figure 7), and (iii) the roof and the playground of the agricultural secondary school in Qena (Figures 8 and 9).

**Figure (6): Hotel**

**Figure (7):Cooperative**



**Figure (8): Secondary School**

**Figure (9): Secondary School**



### **Opportunity:**

Roof gardening has several advantages and it needs very small quantity of soil and small spaces on the house's roofs in rural and urban areas. It does not require mechanical work or sophisticated knowhow, and it has good environmental impacts on the surrounded environment. In addition it is a quite suitable for the social and economic situations of the populated/crowded communities, and provides safe and healthy food. Roof Gardening can also contribute to rationalizing irrigation water in the production process. The vegetable crops especially leaf vegetables are quite suitable for the roof garden plantation. The suitable vegetables for the roof garden plantation in Qena governorate are tomato, eggplant, lettuce, paper, squash, cabbage, green beans. There are great opportunities for spread roof garden and improve the vegetable food security in Egypt in general and in Upper Egypt in

particular. The areas that need immediate attention include roof garden plantation and vegetable marketing.

The main objectives of the roof garden plantation initiation are: (i) to provide job opportunities for the poor housewives for self-sufficiency and /or for local markets. (ii) to achieve reasonable level of food security and nutrition rates through producing enough quantities of fresh vegetables and fruits such as strawberry. (iii) to supply safe and healthy fresh vegetables. (iv) to keep the prices of fresh vegetables, sold in the selected NGO's areas, stable. (v) to offer employment opportunities and income to poor households through marketing the surplus in the village markets to sustain the roof garden activities.(vi) to spread the idea of roof garden plantations in the selected sites of NGOs, Youth Centers and households by making the housewives aware of the importance of the project and its good economic, nutritional and environmental impacts.

**Approach:**

ENID plans to establish small modern roof garden units in Qena which is one of the least privileged governorates in Upper Egypt. The units will help overcome the problems of food insecurity and unsafe food. The roof garden units will produce safe and high-quality products and at the same time it will provide employment and income generating opportunities to women and poor households. ENID in collaboration with the Agriculture Research Center (ARC) of the Ministry of Agriculture and Land Reclamation (MOALR) will provide training to the participating household and will ensure proper dissemination of the related information and practices. ENID in collaboration with the NGOs and/or the Youth Centers (through the work of ENID Component A), will select proper locations for the roof gardens units. A stress was made from the beginning on ensuring the full participation of all stakeholders including women at the household, active NGOs in the community and extension officers. ENID will conduct a basic and limited family consumption pattern survey to be used as a baseline to monitor the progress made through implementing the project. The active and efficient NGOs and/or the Youth Center will participate in the sustainable management through: (i) the active and continuous participation in the steps of project establishment; (ii) monitoring and evaluation of the selected household to provide the needed technical support; and (iii) helping the household to market their products.

The housewives' role is crucial because they will contribute effectively in: (i) attending the training course concerning farming, marketing and maintaining processes;(ii) carrying out the various farming processes; (iii) providing a part of the necessary operating costs needed till harvesting; and (iv) marketing the surplus in the village market and/or the youth center to improve the livelihood level.

ENID also ensured that the activity has a built-in sustainability element to ensure profitability, continuity and possible scaling-up in the future. In collaboration with ARC-MOALR, ENID will provide technical and managerial capacity building to the management of the selected NGOs including accounting and book-keeping measures

in addition to training in operation and maintenance. ENID will also provide support to monitoring the technical and financial performance during the initiation period.

**Benefits and Possible Impact:**

- 1- The financial and economic viability of the roof garden plantation depends on: (i) the numbers of cultivated tables per household,(ii) The number of plantation rotation per winter and summer season, (iii) The types of cultivated crops in each season, (iv) The number of plants per table, (v) The productivity per plant and (vi) The prices of inputs used and the produced outputs.
- 2- Two systems will be utilizes, namely, (1) Pot Trays and (2) Deep Water System.
- 3- According the first system (i.e., Pot Trays), the investment indicators can be summarized as follows: (i) the internal rate of return (IRR) is estimated at 54%; (ii) the benefit cost ratio is estimated at LE 1.82; (iii) the net present worth (NPW) is estimated at LE 1556; and (iv) the capital turnover is estimated at 1.87 years.
- 4- According the second system (i.e., Deep Water System), the investment indicators can be summarized as follows: (i) the internal rate of return is estimated at 92%; (ii) the benefit cost ratio is estimated at LE 2.96; (iii) the net present worth is estimated at LE 4435;and (iv) the capital turnover is estimated at 1.09 years.
- 5- Selected environmental impacts of the roof garden plantation can be summarized as follows: (i) 1.5 m<sup>2</sup> of green area produces Oxygen needed for the survival of one human for a year; (ii) each 1 m<sup>2</sup> of green surface eliminates 0.1 kg of air pollutants per year; (iii) reduces temperature in the rooms beneath which is highly desirable in Upper Egypt and reduces the consumption of electricity and other utilities; and (4) recycling residues and produce valuable organic fertilizers (compost) and animal feed (silage).
- 6- Roof garden plantation will also provide employment opportunities for women and young girls at home. These employment opportunities are more relevant to the culture of many parts of Upper Egypt.