
BASELINE SURVEY OF CITY VEGETABLE GARDENING IN GREATER ACCRA

E. T. Blay¹; E. O. Monney²; E. Gaveh; P. Adu-Amankwah³

1. Crop Science Department, University of Ghana, Legon

2. Crop Science Directorate, Ministry of Food and Agriculture, Accra

3. Food Research Institute, Council for Scientific and Industrial Research, Accra

18

ABSTRACT

This research work sought to document the profile of vegetable producers in Accra city gardens, study the state of vegetable production in the city gardens and identify the strengths, constraints and the opportunities for interventions of the city vegetable gardening industry. The Participatory Rapid Rural Appraisal approach was used in the survey in addition to the administration of a structured questionnaire. Parameters considered in the design included bio data of operators and major production and post production factors. Individuals and groups were interviewed from ten selected communities. In all sixty-three persons and groups were interviewed. Results from the survey showed that the industry offered employment and income generation opportunities to low level illiterate and semiliterate urban male youth between the ages of 21 and 40 years. It also provided a large proportion of the city's vegetable needs. The industry also satisfied a real need as a major source of fresh exotic vegetables for many expatriate and middle income households as well as the mushrooming fast food industries and restaurants in the city. The respondents felt that for the majority of the population the consumption of such vegetables was very low or non-existent and needed to be promoted. The sector was beset with a number of challenges, the major ones being i. Absence of usufruct rights that militates against proper land management and long-term security. ii. Low education and poor information delivery systems for the practitioners, the majority of whom are illiterate or have only the basic education. iii. The use of poor quality/contaminated water for irrigation that poses a real health hazard for both the producers and consumers. iv. Even though a few of the growers have formed associations of sorts, there are organizational and management gaps that require interventions. It is recommended that the Southern Zone of the Ghana Institute of Horticulture (Gh. I. H.), within whose domain of operations these growers fall should provide leadership in the planning and organization of training sessions for these growers. In so doing the concerns and suggestions given by the growers should be taken into account so that the Gh. I. H. would have their full participation.

INTRODUCTION

African countries are becoming increasingly urbanized. In 2000 the United Nations reported that 38% of Africans lived in urban areas. This figure is expected to increase to 55% by 2030. Urbanization presents both opportunities and challenges, but indications for Africa are that the challenges outweigh the opportunities (Obosu-Mensah, 2005). The growth in urbanisation has been accompanied

by the development of urban and peri-urban agriculture.

There are many reasons why urban dwellers go into agriculture but declining purchasing power for many urban workers is an important contributing factor. Furthermore, urban agriculture is potentially lucrative. It is indispensable for many people, living in Africa as it provides food for the home and releases pressure on family budget (Kofie, 2005) as well as providing extra income. In areas where it is well

organised and managed, it also serves as a green belt enhancing the environment around the cities.

Urban agriculture has been going on in Ghana since the close of the nineteenth century particularly around the major cities of Accra, Kumasi, Tamale and Takoradi. Asomani-Boateng (2002) reported that exotic vegetable production was introduced and promoted by the British colonial administrators purposely to feed the European settlers and to beautify their residences, and later to meet the demand of allied forces during the two world wars. During that period and after independence (1957), the cultivation of indigenous staple crops was not permitted in urban areas for health reasons.

Later however, under the National Redemption Council government's "Operation Feed Yourself" programme from 1972-1976, urban agriculture increased as it benefited indirectly from government's policy. This was the time when urban farming was tolerated and the stringent regulations that curtailed urban agriculture were relaxed. The cultivation of vegetables has since been going on at different locations in and around the city of Accra although not much attention has been given to this industry.

Accra, the capital city of modern Ghana, and the seat of colonial administration since 1877 is located between latitude 5°32' and 5°38'N and longitude 0°06' and 0°16'W on the south eastern coast of the country. The current metropolitan area encompasses the city itself, Tema and the outlying semi-urban Ga districts.

The residential population of Accra is estimated to be 2,015,608 and daily commuters are estimated to be 2,000,000 bringing the city's population to a little above four million (Aziz 2005). Accra is estimated to be growing at a rate of 4.3 % per year. The city gardeners in and around Accra grow and supply 90% of the city's fresh exotic vegetables (Annorbah-Sarpei 1998).

The people engaged in city gardening in Accra are predominantly migrant, small-scale, landless farmers who produce their crop on undeveloped small parcels

of government owned land along streams and large drains flowing through the city. Vegetables are produced on 1.2 to 1.5m wide raised beds 3 - 5m long. Individual farmers grow crop between 5 and 100 beds of different vegetables at a time depending on their resource strength. In many instances, they exist in clusters or loose associations headed by opinion leaders.

Some of the groups have benefited in the past from interventions by Ministries Departments and Agencies such as the Environmental Protection Agency, Ministry of Food and Agriculture and the Metropolitan Assembly. However, the number of city gardeners has increased tremendously in recent years due to an increase in rural-urban migration (Annorbah-Sarpei 1998).

Being either illiterate or semi-literate, and having poor access to information, some of these farmers are not aware of latest developments in food safety and crop protection. It is therefore not uncommon to encounter farmers using industrial and domestic wastewater for irrigation, or abusing agrochemicals. The chemical abuse takes the form of either application of higher than recommended rates, failure to observe pre-harvest interval recommendations or the use of unapproved chemicals on their crops.

OBJECTIVES

This survey sought to support the GhH's vegetable commission to document the profile of vegetable producers in Accra city gardens, study the state of vegetable production in the city gardens and to identify the strengths, constraints and the opportunities for interventions.

METHODOLOGY

Survey

The Participatory Rapid Rural Appraisal approach was used in the survey in addition to the administration of a structured questionnaire. As the

city gardens are spread all over Accra, individuals and groups were interviewed from ten selected communities. In all, sixty-three persons and groups were interviewed.

Questionnaire Design

The structured questionnaire was prepared and administered to the growers. Parameters considered in the design included bio data of operators (name, age, sex, marital status, number of children, educational level, length of practice, and link to organization or producers' grouping). Major production and post production factors were also studied. Results of the survey were analysed using the SPSS 11.0

Sampling Area

City gardeners were interviewed from a broad spectrum of growers scattered all over Accra and Tema. Areas visited included New Achimota, Dzorwulu, Ring Road Estates (in front of Ghana Broadcasting Cooperation), Airport Residential Area, Legion Village, and Areas behind the Motorway, Sakumornor, Ashaiman, Community 20, and Tema beach road.

RESULTS

Human resource for the industry:

Accra city gardening is dominated by the male youth. 98.4% of respondents were male. This confirms the findings of Asomani-Boateng (2002) who reported in his study of "Urban cultivation in Accra" that seventy-two out of eighty-seven respondents (90%) interviewed were male. Most of the practitioners were between the ages of 21-50 years; 36.5% were between the ages of 21 and 30 and 23.8% were between the ages of 31 and 40 and 15.9% were between 41 and 50. Thirty-seven percent of the gardeners were married with children and/or dependents numbering between 1 and 12. Most of the respondents (87.3%) owned the enterprises while 12.7% were mostly relations of the owners who worked with the owners.

As shown in Figure 1, the educational background of the city gardeners varied with the majority within the illiterate to Junior Secondary School level graduates range. Few have had any formal training in farming or related courses in vegetable production. About 80.9% had had no exposure to improved agricultural practices such as integrated pest management practices (IPM). Most of the practitioners had learned vegetable production on the job and through interaction with colleague farmers. Of the 19.1% who had been exposed to some agricultural training, only 4.3% had received training at the agriculture institute level. Only about seven percent of respondents could only boast of Basic School Agriculture training whilst 6.3% of respondents had had some exposure to IPM.

Most vegetable growers undertook almost all activities by themselves; when necessary they fell on family and dependants for supplementary labour. In addition to family labour, some respondents employed the services of hired labour as required

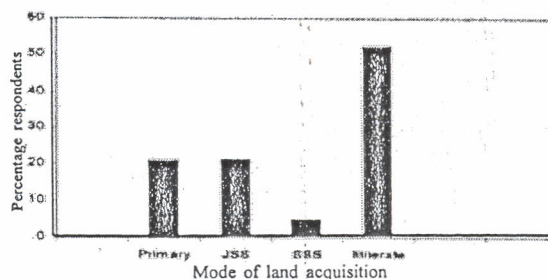


Fig 1: Educational background of city gardeners

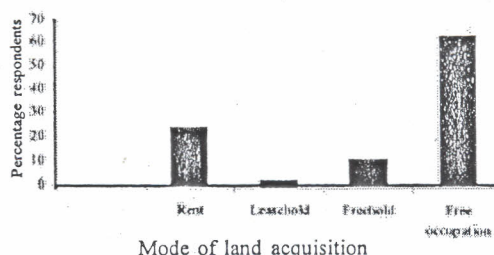


Fig 2: Land Tenure of city gardening in Accra

however; some of the respondents complained about the cost and availability of labour.

Although vegetable gardening has been going on in Accra since the pre colonial era (Asomani-Boateng (2002)); it seems to be a rather fluid area with very high turnover. This is evidenced in the percentage of people involved in this enterprise. About 40.3% of respondents had been growing vegetables in Accra for not more than three years. Another 32.3% had been in vegetable production for up to six years. Only 24.2% of respondents had been cultivating vegetables in Accra for more than nine years.

Land tenure and average garden sizes of city gardening in Accra

The main mode of land acquisition of the city gardeners is by free occupation. About 60.3% of respondents grow their crops on lands for which they pay no rent or levies to the land owners. However 11.1 % actually own their farmlands and 25.4% pay an annual rent to land owners. Only 1.6% of respondents leased the land (Figure 2).

The parcels of land on which the gardeners grow their crops are relatively small. 49.2% of respondents cultivate less than an acre while 25.4% cultivate between 1 and 2 acres. Only 7.9% of respondents cultivate more than 5 acres (Figure 3).

The land cultivated is normally divided up into beds. Bed sizes differ from farmer to farmer; but mostly 1 m x 15m. For those cultivating more than an acre the bed numbers increase with increased land area; 31.8% of those interviewed cultivated between 51 to 100 beds or more at a time.

Types of vegetables cultivated

City gardeners produced more than one crop at a time. They engaged in the production of exotic vegetables such as cauliflower (*Brassica oleracea* L. var. *botrytis* L.), onions and spring onions (*Allium cepa*), cabbages (*Brassica oleracea* L. var. *capitata* L), lettuce (*Lactuca sativa* L.), tomatoes

(*Lycopersicon esculentum* L.), okra (*Hibiscus esculentus* L.), green pepper (*Capsicum annum* var *grossum*), and carrots (*Daucus carota* L.). Not many of the local vegetables such as corchorus (*Corchorus olitorius* L.) were grown (Table 1), where some was grown it is mainly for home consumption and not for sale.

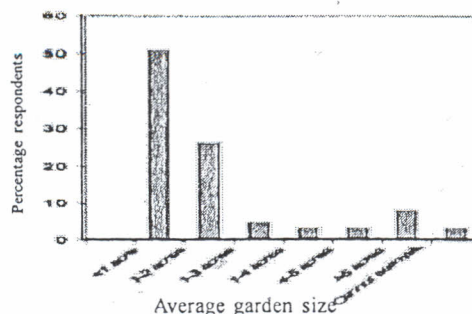


Fig. 3. Average garden size

The reasons given by the gardeners for choice of vegetables grown included their knowledge on the production and handling of the commodity, low labour requirements, earliness and relatively low cost of production. For a large number of respondents, a vegetable was cultivated if the potential for profitability was high and there was a ready market for the produce.

Seed acquisition and storage

Most of the growers (55.6%) purchase seeds in required quantities as and when needed from agro-chemical shops. Thirty-six percent of respondents purchased seeds from other sources whilst about 6.3% collect or purchase seeds from colleague farmers. Seeds are normally used immediately or within a period of one to two weeks after purchase. Not much is stored, but when they have to store, different means of storage are employed by the respondents. Some store seeds in cotton bags, others in refrigerators, cool dry places, warm places e.g. in the eaves of the kitchen, (for protection by smoke from open flames), empty tins in a room, air tight containers, in the roof of a building in a polythene bag, or other such containers or places.

Crop production techniques

Crop rotation is important in the management of pests and disease outbreaks. Of the 63 city gardeners interviewed, 53.3% practised crop rotation but mostly without any scientific basis for the crops grown in rotation. The majority of the growers interviewed produced only one crop a year. Twenty-seven percent of respondents practised three cropping cycles a

others stirred the beds regularly in a bid to prevent any sprouting weeds from establishing.

Different tools were used for different activities, with respondents using three or more land preparation tools. The commonly used tools were hoes, cutlasses, rakes, spades, pick axes and digging forks.

Plant nutrition

A range of inorganic and organic fertilizers were used by the gardeners. Normally two or more types of fertilizers and/or manure were used depending on their availability or the crop being grown. The general practice was for growers to apply some basal fertilizer for whatever crop was to be grown. Both manure and inorganic fertilizers were used as basal fertilizers (Tables 2a and 2b).

Organic manures commonly applied are chicken droppings, cow dung, compost and green manure in that order. The main source of manure however is chicken droppings, used by 71.4% of the respondents. When this is unavailable growers usually use cow dung.

Inorganic fertilizers used included Urea, NPK, Sulphate of Ammonia, and some liquid fertilizers. Application rates and number of times of application varied widely and depended more on the growers' own discretion, or recommendations from colleague farm

A few however followed recommendations given by agricultural extension agents. Some rates of application followed by the gardeners are presented in Table 2a.

Irrigation

All the growers practised some form of irrigation. Depending on availability, growers, used water from various sources for irrigation. Figures 4 and 5 show the distribution of growers, their water sources; and method of irrigation employed. The majority of growers used watering cans to carry waste water

Table 1: Types of vegetables cultivated

Vegetables cultivated	Percent
Onion	46.0
Assorted vegetables	46.0
Okra	7.9
Cabbage	4.7
Spring onion	4.7
Tomatoes	3.2
Carrot	3.2
Lettuce	1.6
Cauliflower	1.6
Green pepper	1.6

year while 19% cropped more than three cycles a year.

Gardening, gardening tools and equipment

The city gardeners prepared land by slashing, weeding and uprooting stumps followed by the construction and shaping of beds. Approximately 25 % of respondents made beds across the slope as a means of managing the slopes and controlling erosion. Drains were constructed to drain excess water where necessary.

Weeding was practiced by all respondents. Some respondents adopted more than one method of weed control. The main method of weed control particularly after transplanting was hand picking. This was practised by 79.3% of respondents. About 24% of respondents used herbicides to control weeds;

from nearby drains and gutters flowing through the city to water their crops.

Pest and disease control

All the growers had some idea of pest and disease infestation and their control.

Twenty-three percent of respondents were aware of integrated pest management practices, but only 6.3% of them had had some exposure to integrated pest management practices (IPM).

The majority of growers understood that pests and diseases caused reduction in yield and quality of produce. As such they adopted some forms of control to reduce losses. The main mode of control was by chemical application. Information on how to

Table 2a: Organic manure application

Manure source	Percent
Chicken	71.4
Cow dung	14.3
Compost	6.3
Green manure	1.6
Others	6.4

Table 2b: Inorganic fertilizer application

Fertilizer source	Percent
NPK	92.0
Sulphate of Ammonia	52.3
Liquid fertilizer	20.6
Urea	3.1

control the diseases and pests came from various sources. But the farmer decided what to apply most of the time. The main sources of information were the Agricultural Extension Agents from MOFA, the agro chemical dealers and from colleague farmers and some non governmental organizations (NGOs).

The main pests and diseases identified as economically significant are presented in Table 3.

Table 2: Fertilizer usage

Table 2. Rate of application of inorganic fertilizers

Application rate	Percent Practitioners
Other	23.7
2 bags/acre	6.8
4 bags/acre	6.8
1kg/bed	6.8
Not specified	6.8
3 bags/acre	5.1
6 bags/acre	5.1
1 kg/ 2 beds	5.1
1 kg/ 5 beds	3.4
50kg/10 beds	3.4
1 kg/>5 beds	3.4
50kg/ 30 beds	3.4
1-2 handfuls/bed	3.4
1 margarine tin/bed	3.4
5 bags/acre	1.7
1 bag/2 beds	1.7
1 kg/ 4 beds	1.7
50 kg/ 5 beds	1.7
8-10 handfuls/bed	1.7
>10 handfuls/bed	1.7
2 spoonfuls/plant	1.7
2 margarine tins/bed	1.7

Each grower had identified more than one pest and fungal attack on each crop.

The growers were very much aware of the harmful effects of chemical abuse but many had not personally experienced such effects themselves and hence seemed not to appreciate the dangers of chemical abuse. Therefore as many as 65.4% of the respondents did not use any protective clothing during their operations. Of the 34.6% who used protective clothing, gloves and/or boots were the

main protective clothing used, with some farmers using additional protective clothing (Table 4).

was normally packed in polythene sacks, baskets or jute bags.

Harvest and post harvest handling

Produce was sold immediately after harvest as the growers neither stored produce had storage facilities for holding them before marketing.

Growers did not have any specific times of harvesting matured produce. Seventy-seven percent of growers harvested any time of the day. Another 14% harvested in the mornings but more in response to the market demand rather than any laid down harvesting and post harvest handling principles. Most (66.7%) growers harvested piece meal whereas

Marketing -

Sixty percent of the respondents produced for a contract market and therefore had guaranteed outlets for their produce (Figure 6). On farm sales was the

Table 2c: Common pest and diseases

Common pests	Percent	Common diseases	Percent
No knowledge of identity	26.2	Not observed	38.2
Leaf miners	19.7	Fungal	29.1
Caterpillars	19.7	Not identifiable	25.5
Aphids	14.8	Bacterial	5.5
Diamond back weevil	4.9	Viral	1.8
Whiteflies	3.3		
Moths	3.3		
Leaf eaters	1.6		
Thrips	1.6		
Grasshoppers	1.6		
Scaly leaves	1.6		
Beetles	1.6		

29.8% harvested produce in bulk. Yields were perceived to be fairly satisfactory with field losses ranging from 0 - 10% for 65.5% of respondents. The rest had higher losses.

most practised method of disposing of produce although a substantial amount was also sold on the market as is evidenced by the Figure 7. Most sales were done by wholesale although some respondents employ both wholesale and retail methods when marketing produce. Wholesale frequently took the form of selling produce by bed. Growers reported that they received the best prices during festive occasions and during the minor and dry seasons from October to January - Figure 8. The main mode of payment for produce was by cash however some credit sales also occurred from time to time.

Harvested produce are rinsed, selected and trimmed to some extent. About 57.4% of the respondents did not grade their produce. Of the 32.8% who practised any grading, this was done by size. Only 3.3% of respondents used weighing scales in grading. About fifty percent of the growers did not package produce for sale. Where packaging was practised, produce

Risks encountered by city gardeners

City gardeners were faced with a number of risks some of which were running at a total loss, exposure to health risks, failure of rains and injuries from farm tools. Benefits accruing from vegetable production in the city included availability of vegetables for the family's consumption, means of employment and

Table 4: Use of protective clothina for pest and disease control

Kinds of protective clothing used	Percent
Nose cover	10.9
Boots	4.3
Gloves	17.4
Goggles	4.3
Long sleeves shirt	2.2
Overall	8.7
None	65.4

source of income to growers. Indeed for the majority of growers (80.3%) it was the only source of income.

Production constraints

The growers identified pest and disease build up, unavailability of water and lack of funds to invest in the business as the three major constraints to their production. Table 5 shows the Qther constraints listed by them.

Growers' proposals for improvement of the industry

The perceived interventions for facilitating and improving growers' practice included the provision of a regular source of good water for irrigation; ensuring the availability of good quality seeds for expansion; supply of requisite farm implements; provision of more land so they could enlarge their acreages; accessibility to micro financing facilities; regular training sessions on good agricultural practices and technical assistance from MOFA and allied institutions. Most of the respondents (98.4%)

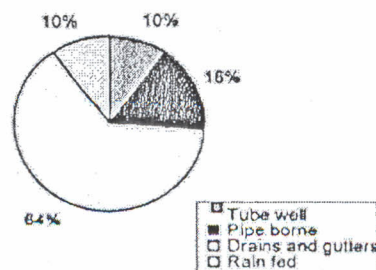


Fig.4. Source of water for irrigation

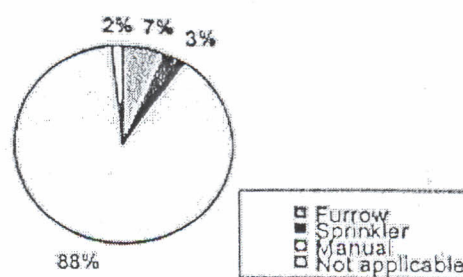


Fig. 5. Method of irrigation

intimated that they were willing to contribute particularly labour towards any proposed interventions. Only 3.3% of respondents were willing to contribute financially.

They identified the need for relevant institutions to educate the public on the benefits of incorporating vegetables into their daily diets. They also proposed the establishment of a forum through which farmers would be updated on new production technologies and changing trends in the industry. They expressed a desire to see a follow up on the survey being undertaken and intimated that vegetable production is a good means of employment. Some of the areas growers would like support for were in education on the safe use of pesticides, and pests and disease control measures for vegetable production.

Support services

72% of the respondents did not receive any assistance from any institution government or otherwise. 8.2% of the respondents received some

support from MOFA while about 5% received support from non-governmental organizations.

DISCUSSION

City vegetable gardening in Accra is a long standing industry that has been neglected by government authorities but has great potential for socio-economic development and sustainable environmental management (Asomani-Boateng -2002). Analysing

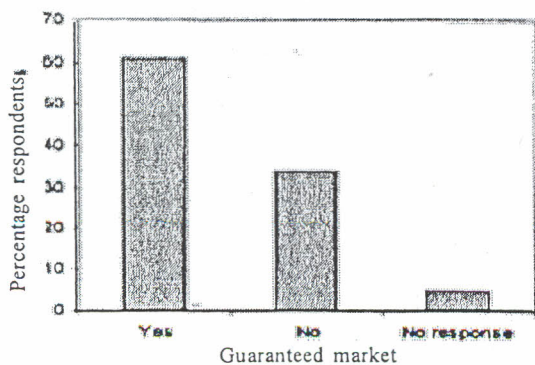


Fig.6. Assurance or contract sale

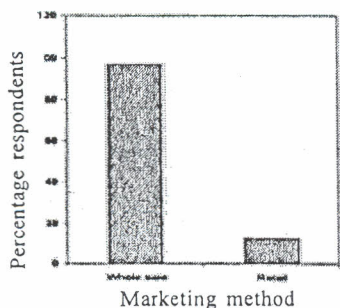


Fig.7. Marketing place for vegetable produced

the growers and their educational background, it is evident that the majority of vegetable gardeners in Accra are illiterate or semi literate youth with large numbers of dependants. By investing in city gardening, this group of people obtain some employment and income.

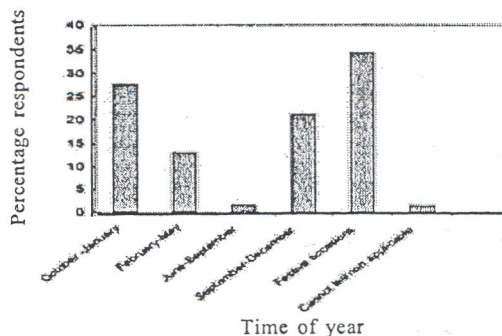


Fig.8. Time of the year for best prices

Table 5: Rankin order of major production constraints

Problems	Frequency of occurrence (%)
Pest and disease build up	41.2
Unavailability of water	36.5
Lack of funds	34.9
High cost of production (input)	25.3
Lack of equipments	23.8
Lack of ready market	22.2
Land tenure problems	12.6
Lack of clean water for irrigation	11.1
Lack of technical know how	4.7
Inefficacy of agro chemicals	3.1
Lost of produce through theft	1.6
Delay in payment by customers	1.6
Disease outbreak	1.6

The socio-economic benefits of this industry could be further enhanced should systems be established in the city to facilitate the growers' access to information, training, financial and other relevant services to improve on their production and marketing practices and make the industry more profitable. One of the ways to achieve this could be to encourage the growers to form identifiable groups

and mainstream them into the food supply chain. The survey revealed that only 38% of respondents belonged to some associations which met regularly or as and when necessary to deliberate on issues relating to their occupation.

The low educational background of the growers may be the cause of their inability to fully understand and apply good farming principles in their production which negatively impact the returns on their investments. Although a high proportion of exotic vegetables supplied to the city come from city gardeners in and around Accra (Annorbah Sarpei 1998), there is still a large proportion of city dwellers that stay away from consuming these vegetables. This group of consumers perceive that most of the vegetables are contaminated due to the use of waste water for irrigation and the abuse of agrochemicals and as such are unwholesome (Obosu-Mensah, 2005). Results from the study revealed that the growers' knowledge of crop production techniques such as crop nutrition and rotation are quite rudimentary. The practices varied from farmer to farmer. There was no scientific basis for the practices adopted or the choice of crops for the rotation. A similar observation was made on plant nutrition practices (Table c. Farmers followed different fertilizer application regimes thus emphasizing the need for regular training and dissemination for capacity building in good agricultural practices for the city vegetable growers. In groups or associations, vegetable gardeners' production and financial management capacities could also be built up through training programmes and workshops to ensure that they produce better quality vegetables to satisfy a wider market.

The city gardeners concentrated mainly on the production of exotic vegetables to satisfy the expatriate community, middle income earners and the fast food industry. The diversity of vegetables produced by each farmer served as insurance against total crop failure and guaranteed almost all year round generation of income from the sale of different vegetables. The few indigenous vegetables that were grown were mainly for family consumption. Increased production of indigenous vegetables during June to

September (Figure 7) when prices for exotic vegetables were low could enhance the gardeners' income from their enterprises. Properly managed, the diversity of vegetables grown should offer great opportunity for IPM as well as soil nutrient management.

Though over fifty percent of the growers practised some form of crop rotation, this has not been effective in breaking disease and pest cycles or enhancing nutrient management because closely related crops are often rotated on the same plot for long periods. Fallow periods, where practised, are often very short owing to pressure on land, and hence ineffective. Relevant information for improving their agricultural practices exists in published and unpublished research work done in the research institutions and universities. Unfortunately, growers do not have ready access to such information and so cannot take advantage of them to improve on production practices; hence the need for the training programmes in easily comprehensible forms to the growers.

The growers used simple hand held tools for their operations. No mechanical equipment was used due probably to the small plot sizes or their inability to access such equipment. Although most of the gardeners practised irrigation, the majority of them (88%) practised manual irrigation with watering cans using water from large drains or gutters. This posed a health threat to both the growers and consumers as some of the drains are known to have high doses of heavy metals and faecal matter (Kofie, 2005). The use of watering cans for irrigation seemed adequate for their production scale; however, to reduce crop contamination and exposure of growers to infections from using polluted water for irrigation, and encourage prudent water management practices, growers could be educated to replace the use of the watering cans for irrigation with sprinklers and gravity drip systems where affordable. This would further free labour for other field operations and increase yields during the dry season. The benefit of reduced demand for labour would be welcome as farmers are already constrained by inadequate labour for expansion of production.

The study revealed that farmers continued to grow a mixture of vegetables, mainly in response to market demand. The increase in cultivation of onions (Table 1) could be due to the demand created by the many fast food joints springing up in the city. These food joints serve mainly fried rice (a meal of rice mixed with vegetables mainly onions, carrots and green pepper) and chicken. The awareness being created by education on the health benefits of the consumption of safe vegetables would contribute to presently increasing demand for vegetables. The level of consumption of fresh vegetables in Ghana generally is relatively low compared to the neighbouring countries. As emphasized by the growers, there is the need for intensification of education on diet and the benefits of increased intake of vegetables for the well being of the population and the socioeconomic development of both the practitioners and the population.

Beyond improving the resource and human capacity of city gardeners, the issue of land security needs to be given serious attention. One of the reasons why growers did not invest in better irrigation facilities and better agronomic practices was that the parcels of land on which they farmed were not secured. Most of the lands utilized by the growers were government lands which they occupied on a temporary basis without any formal arrangements. This was possible because the lands were not yet being utilized for the intended purposes for which they were acquired. As most of them freely occupied the land, they were required to move or vacate the farms as and when the land owners need the land for other purposes. Demarcation of areas for city gardening and proper allocation of plots to city growers would encourage them to invest in the industry for better returns.

CONCLUSIONS

City vegetable production is entrenched in the Accra-Tema metropolis. It serves as one of the first lines of employment for many male youth especially from the northern part of the country and a major source of income for their families and dependants.

The industry satisfies a real need as a major source of fresh exotic vegetables for many expatriate and middle income households as well as the mushrooming fast food industries and restaurants in the city; but for the bulk of the population the consumption of such vegetables is very low or non-existent and needs to be promoted.

The city vegetable gardening sector is beset with a number of challenges. The major ones and their suggested interventions are as follows:

- Absence of usufruct rights that militates against proper land management and long-term security. This requires the designation of specific areas for city gardening, with structured land tenure arrangements.
- Low education and poor information delivery systems for the practitioners, the majority of whom are illiterate or have only the basic education. Only a small fraction of them have had any training in crop production. Proper training in crop production systems, crop protection principles and practices, good agricultural practices, and food safety with special emphasis on the correct use of agrochemicals is most crucial.
- The use of poor quality/contaminated water for irrigation that poses a real health hazard for both the producers and consumers. This is a well flogged problem that needs to be addressed without further delay since the success of city gardening impinges on irrigation and hence the gardeners will continue to use any source of water at their disposal in order to eke a living.
- Even though a few of the growers have formed associations of sorts, there are organizational and management gaps that require interventions. Well organized associations will facilitate the delivery of any interventions.

The study revealed that little change has occurred in the profile of city gardening in the Accra-Tema

Metropolitan area compared to the information gleaned from the literature. It remains a temporary employment for male migrant youth with very high turnover. The challenges facing the industry have been brought to the fore by a number of studies over the years. Hence the growers' request for concrete interventions is underscored.

The Southern Zone of the Ghana Institute of Horticulture, within whose domain of operations these growers fall could provide leadership in the planning and organization of training sessions for these growers, establishment of demonstrations on good agricultural practices and linking growers to other support service providers to enhance the growth of the industry. At the planning and implementation stages, the growers have to be involved and their concerns and suggestions should be taken into account so that the GhlH would have their full participation.

ACKNOWLEDGEMENTS

We gratefully acknowledge funding provided by the Canadian Society for Horticultural Science (CSHS). The members of the research team i.e. Dr. Fiscian, University of Cape Coast; Dr. Osei Bonsu, Cocoa research Institute; Mr. Odei Birinkorang, Landscape

Horticulturist; Mr. George Owusu Afiriyie, Department of Parks and Gardens, Dr. P. E. Sekyi, Landscape Horticulturist Miss Miriam Sarkwa-Mante and Mr. Kingsley Numenya who collected data for the survey.

REFERENCES:

Annorbah-Sarpei, A. J. (1998). Urban Market Gardens, Accra, Ghana. The Mega Cities Project Publication MCP-018C

Asomani-Boateng, R. (2002). Urban cultivation in Accra: an examination of the nature, practices, problems, potentials and urban planning implications. *Habitat International* 26; 591-607.

Aziz Abdul (2005). "Accra population hits four million". *Daily Graphic*; No. 149574, 1st November 2005; page 29.

Kofie, R. (2005). "Urban agriculture or gutter agriculture, the risks consumers face". *INFO @ INSTI Newsletter of the Institute of Scientific and Technological Information* Vol. 3. No. 1 ISSN 0855 - 6539.

Obosu-Mensah, K (2005), "Changes in official attitudes towards urban agriculture in Accra". *African Studies Quarterly* 6 No.3 (Online). U RL: <http://web.africa.ufl.edu/asq/v6/v6i3a2.htm>