NATURAL RESOURCES INSTITUTE

Kumasi Natural Resources Management Research Project (KNRMP)

Report on study of agriculture in the urban gaps of Kumasi city

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Contributors

The study was initiated by Martin Adam of the Natural Resources Institute (NRI) and carried out by Patrick Kumordzie; an MSc student of the Institute for Renewable Natural Resources (IRNR), University of Science and Technology, Kumasi. He was supervised by Mrs. 011Vria Agbenvega, a lecturer in Socio-economics at the IRNR.

The bulk of the material in this report was contributed by Mr. Kumordzie and Mrs. Agbenyega and was collated, edited and illustrated by Martin Adam. However, the text from section 2 onwards remains for the most part as originally submitted by Mr. Kumordzie, with the addition of annotated spatial figures from the KUMINFO GIS.

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Acknowledgements

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Mrs. Judith Pender and other members of the Environmental Sciences Department of the NRI and Mr. Kingsley Boateng of the IR'vR have also contributed with the provision and interpretation of the GIS and remote sensing data of which the study has been able to make use.

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BACKGROUND TO THE STUDY

Place in KNRMP project

The Kumasi Natural Resources Management Project (KNRMP) is funded by the UK Department for International Development (DFID) and managed by the Natural Resources Institute (NRI) of the UK in collaboration with the University of Science and Technology in Kumasi and the University of Nottingham in UK.

Arising from studies in the inception phase of the project on the soil fertility and livelihoods project components, the field results indicated the increased importance of backyard farming in the settlements closest to the city centre and the preponderance of crops grown, often in low-lying seasonally-waterlogged areas, for fresh consumption in the city. In contrast to the relatively well documented bush-fallow food-crop and intensive vegetable crop farming systems, few details of these farming systems were collected. Whilst some of these activities may be carried out by relatively wealthy owners of established plots, there is evidence to suggest that pportunistic farming systems of this type may be a means of subsistence or income support to some of the most disadvantaged members of society, thus concurring with the poverty focus of the project.

Whilst the present area of study is within the "city limits" and very much "urban", the cropping systems found there represent the use of "gap"[1] lands which are left between new urban developments in the peri-urban areas of Kumasi as well and are therefore of relevance as examples of where the present trends of urbanisation in the peri-urban areas may lead.

The identification and description of such systems and those who depend upon them will be of use in planning agricultural extension, waste management and welfare programmes in the KMA area. A knowledge of who is engaged in urban natural resource use, why, and what is its significance in household economies will aid understanding for planning future natural resource use.

[1] These could also be termed "open spaces" or "unbuilt areas".

Relation to other studies

Findings of a number of studies of urban agriculture in African cities (quoted in UNCHS 1996) have shown a pattern of poor women practicing urban agriculture in order to provide food for themselves and their families. However, in Lorne, similarly to our surveys of the peri-urban area, it was found that most of the market gardeners were men. And in urban areas of Tanzania it is the retrenched civil servants who are leading in the urban dairying sector (Sumberg 1996). The latter author questions the equating of food production in towns with improved security for poor people and stresses that the significance of urban-rural interactions should be considered in explaining the survival capabilities of the urban poor.

Opportunities for the use of urban waste products, from markets and industrial processes, may be greater within the urban area than the peri-urban due to the transport distance being less; however, the resources of the urban poor for such transport may be limited to manual headloading; Kumasi is not a city which has taken to intermediate forms of transport such as the bicycle, wheelbarrow or hand-cart to any great extent. Waste management rather than resource recognition and utilisation seems also to have been the policy of the municipal authorities, and the practice of or support for recycling has generally not been incorporated into their activities.

Whilst we understand that some urban oil palm plantations in Kumasi have been cut down because they were said to provide refuge for robbers, in other respects, the Kumasi city authorities have not been so draconian in their attitude to urban agriculture as others in Africa. In Harare, standing crops on dambo (valley bottom) lands were regularly destroyed on the pretext that their cultivation interfered with the natural hydrology of the dambos and their contribution to groundwater flows - although, again, the harbouring of muggers was cited (Bowyer-Bower and Drakakis-Smith 1995). In other countries such as the UK, urban agriculture has long been encouraged in the provision of allotment gardens by local authorities, although thelegislation, which dates back to 1908, is in need of

revision, being "vague, obsolete and incomprehensible". Nevertheless, the tenacity of local people in hanging on to their allotments despite erosion of legal protection of tenure provides examples of what empowerment can do to challenge unsustainability (Garnett 1996).

EXECUTIVE SUMMARY

A study was carried out of agriculture in three "urban gaps" - areas of open land - in the central city area of Kumasi. Some 59 plot cultivators were interviewed and responded to answers to a prepared questionnaire. The areas of the plots were outlined in the field on aerial photograph imagery. The questionnaire and geographical data were entered on a GIS system (KUMINFO) based in Kumasi and NRI.

The three areas were South Suntreso, Subin / Asokwa and North Suntreso (Racecourse). In all areas male cultivators predominated (49 out of 59 interviewed). From the **South Suntreso** study (21 respondents) the most notable findings were:-

- Over three-quarters of the plot cultivators have full-time other occupations apart from cultivating their plots.
- Two-thirds were non-Ashanti.
- Only one-third hire any labour to cultivate their plots.
- There is an obvious difference between small plots on the periphery of the area of the gap and larger central plots, in which sugar-cane predominates.
- The larger, central plots are cultivated for dual purpose income and food whereas the smaller ones on the periphery are for food supplementation and security only.
- The present cultivators are generally more interested in bananas, plantain, cassava and taro than their predecessors, who concentrated on sugar-cane, maize and vegetables. This suggests a trend towards crops which can be used as staple foods as well as for cash, and a greater perception of the need for food security. The number of farming enterprises is increasing because more people want to minimize their expenses on food.
- The large proportion who have planted trees suggests that, contrary to the typical peri-urban situation, the plot cultivators have a fair degree of confidence in the security of their tenure.

- Although there are no written agreements to the use of the land, nearly two-thirds of the cultivators feel reasonable security in the continued use of their plots.
- Very few are using any form of organic manure or waste product as manure, despite the potential use of urban waste from the surrounding residential areas.
- Only one received any advice from an Agricultural Extension Agent.
- There were mixed feelings about the future for cultivation in the gap,
- despite the generally expressed confidence in security of tenure.

In the **Subin** / **Asokwa** gap (26 respondents), findings were that, compared to the South Suntreso area:

- A rather higher proportion were full-time farmers.
- An even lower proportion were of Ashanti origin.
- A majority hire labour to work on their plots.
- The majority had cultivated their plots for over 11 years, longer than in South Suntreso.
- Only four out of 26 said that their produce was for home consumption only. The present cultivators grow a wider range of crops, including tree crops, than their predecessors, and these include a range of non-traditional vegetables such as carrots, cucumber and green pepper. Over one-third also farm livestock, principally poultry.
- Whilst none have any written agreement to the use of the land, which is considered to belong mainly to "the Government" or the Railway Corporation, all feel secure in their possession of it.
- Rather more (over one quarter) use manure than in South Suntreso.
- Nearly one quarter receive advice on production either from the Agricultural Extension Agent or the Ghana Organic Agriculture Network.
- There was rather more confidence in the future of farming in the gap and a greater interest in advice and training than in South Suntreso.

- Recent drainage works along the Subin river had displaced some of their farming activities.

In the **North Suntreso** / **Racecourse** area (12 respondents) it was soon apparent that illegal activities such as the smoking of marijuana and the unlicensed carving of timber were common and there were some refusals to respond by those contacted. From those who responded was gleaned the information that:

- One quarter were full-time farmers.

- None was of Ashanti origin.

- Most had only been cultivating their plots for less than five years.

- Whilst the principal crops of both the former and present cultivators are food staples, a greater range of crops, including some vegetables and fruit trees, is now grown.

- Plots are generally smaller than in the other two gap areas.

- Similarly to South Suntreso, half of the farmers said that they grew the crops for subsistence only.

- However, over half had livestock, similar to those in Subin / Asokwa. In most cases these are poultry.

- Nearly half use manure.

- The reported land ownership is more diverse than in the other areas and includes private individuals, the stool and the government.

- Only one received any advice from an Agricultural Extension Agent.

- Three-quarters expressed that they felt security of tenure (but see below).

- There is greater pessimism about the future of farming in the gap than in the other areas.

- Some had stopped farming at the time due to a displacement of stallholders from the central market due to road works.

General observations on the findings

The practice of agriculture in the gaps between urban development in the city of Kumasi may thus be characterised as based on food security as a prime motive, but `-with an increasing diversity of crops and some specialisation in vegetables for the market. From our limited survey we may suggest that the food security aspect

predominates in the poorer areas (South & North Suntreso) whilst income is more of a motivation in the richer area (Subin /Asokwa).

Most of the cultivators are low-income men and most are not indigenous to the city and the region, although they may have lived there for several or many years. This latter finding may be due to either the lack of land for these people elsewhere in the region or also a greater cultural tradition of relatively intensive small plot cultivation.

Whilst many of these findings typify the range of findings in other cities (Koc *et al.* 1999), the odd feature about these farmers is that they appear to feel quite secure on their land even though they have no title to it, either through a traditional or governmental authority. Many plant trees, partly as boundary markers. It may be that some of the urban farmers on government land feel more secure than those on stool or- family lands because it seems, to them, unlikely that their (urban) land will ever be taken for development except in the very distant future, whilst those on (peri-urban) family or stool land are only protected against immediate use. Some of this "gap" land is low-lying land on the periphery of watercourses and prone to waterlogging or flooding, on which building is not permitted; where this is not the case, continued non-use for building in the midst of the expanding city may give a, possibly false, sense of security.

The farmers believe that in future the land will lose its fertility because of the farming practices used. In general, with notable exceptions, the intensity of cropping on these urban gaps is not greater than can be found in peri-urban village valley bottoms around Kumasi. There is clearly scope for providing advice on improving the intensity of husbandry, but the issue of insecurity of official tenure may prejudice government employees against offering services. Were the official generally permissive attitude towards urban agriculture in Kumasi to become a more enabling one much benefit for the nutrition and incomes of the poor could result. Times are changing, and there is a globally widespread and growing assertion that urban agriculture simply cannot be ignored any longer (Quon, 1999).

1.0 INTRODUCTION

For the majority of poor people in developing countries, food is becoming a very expensive commodity. Households in nearly half of the developing world's largest cities, spend 50 - 80% of their average income on food (PCC, qu. in Koc *et al.* 1999). People in cities have fewer coping strategies and therefore pay relatively more for food than rural inhabitants.

Owing to the steep rise in food prices coupled with low wages and salaries of workers, many of them (44 - 70%) in urban areas have taken to urban farming in order to reduce the effects of the soaring prices on their food budget. This type of farming in Ghana flourished considerably after the `Operation Feed Yourself Programme' launched in the early 1970's. There is a great future for the development of urban farming in Ghana, as it has the potential for making a substantial contribution to self-sufficiency in food production particularly, in urban areas.

Generally, interest in urban farming is relatively new, largely unrecognized and unassisted by public and government bodies. Urban farming in most developing countries has been regarded as impermanent, the belief being that the farmland will be lost to other urban land-users or uses.

Nevertheless, urban farming is a ubiquitous feature of the Kumasi Metropolis landscape. These farms contain a wide range of staple and supplementary food crops, fruit trees, and ornamental plants as well as poultry, livestock and fishes. In spite of its important functions, the value and nature of the urban farm has not been given enough attention by researchers in Ghana. Very little information is available on classification, composition, structure, functions and management practices as well as constraints hindering its development and promotion.

1.1 OBJECTIVES

The purpose of the study is to collect data which provides adequate and reliable information for understanding the Kumasi city `urban gaps' crop production system. This is in order to describe the system and make recommendations for its management, improvement and development in the study area as well as related urban

areas. The study seeks to investigate and understand the cropping activities of urban dwellers in low lying valley bottoms.

Even though these areas belong to governmental agencies, they do not restrict individuals who want to farm on their lands. Most people growing crops in these gaps e aware of the temporary nature of their tenure and know that when the need arises they could be asked to stop farming. However, some farmers have been cropping in these areas for over 20 years without any interference from the authorities who own the land. The representative `urban gaps' principally comprise the lower-lying valley bottom areas.

1.2 METHODOLOGY

Data was collected using a two-stage sampling procedure involving visual reconnaissance survey and detailed individual survey. The reconnaissance survey was carried out to select three gaps where crop production or plant gathering are extensively and intensively practiced. Fifty-nine respondents were selected in these three gaps. Detailed individual field survey involving direct observation and questionnaire-based interviews were employed to collect the data.

Stratification of the sites was on the basis of housing density from an earlier

consultants report (Golan Consult 1997). South and North Suntreso are high-density ipusing areas with low class housing in South Suntreso and medium class housing in North Suntreso. In contrast, Subin 1 Asokwa lies between the low density high-class housing area of Ridge and the medium density medium class housing area of Asokwa, with the Asokwa industrial area (mainly sawmills) on the Asokwa side of the Subin stream. There was a change in the original selected site for south Suntreso because reconnaissance showed that there would be difficulties in getting respondents who would be willing to go through the exercise

'The location of the sites was checked (and later delineated) on the remote sensing imagery available, a SPOT panchromatic image from 1994 and the more scent Aerial Digital Photography (ADP) flown in December 1997 under the auspices of the DFID research project 85880, “Development of Methods of Peri-urban Natural Resource Information Collection, Storage, Access and Management”

1.2.1 How persons to be interviewed were selected

Selection of respondents was by walking the area and requesting interviews with those encountered. A reconnaissance had already been done to have an idea of the attitudes and perceptions of potential respondents.

Apart from the North Suntreso site there were no major refusals. Those who were apprehensive about being interviewed in the other areas had a change of mind after being assured that it was an academic exercise which did not have any political or tax undertones.

The gaps and their corresponding number of respondents selected for an in-depth study is depicted in Table 1.1 below.

Table 1.1 Gaps and their corresponding number of individuals selected for the urban gap crop production study in the Kumasi Metropolis

Area (gap)	Code	Number of Respondents
South Suntreso	SS	21
Subin/Asokwa	SA	26
North Suntreso / Race Course	RC	12
Total		59

1.2.2 Dates of field work

25-5-99 General reconnaissance of all the three study sites

SU 3IN/ASOKWA

2-6-99 Reconnaissance
5-6-99 Data collection
8-6-99 "
9-6-99 "
11-6-99 "
19-6-99 "
23-6-99 "

SOUTH SUNTRESO

26-6-99 Reconnaissance survey
30-6-99 Data collection
3-7-99 "
10-7-99 "
17-7-99 "
15-7-99 "
24-7-99 "
31-7-99 "

NORTH SUNTRESO (RACE COURSE)

3-8-99 Reconnaissance survey
7-8-99 Data collection
10-8-99 "
14-8-99 "
21-8-99 "
25-8-99 "
28-8-99 "
31-8-99 "
4-9-99 "

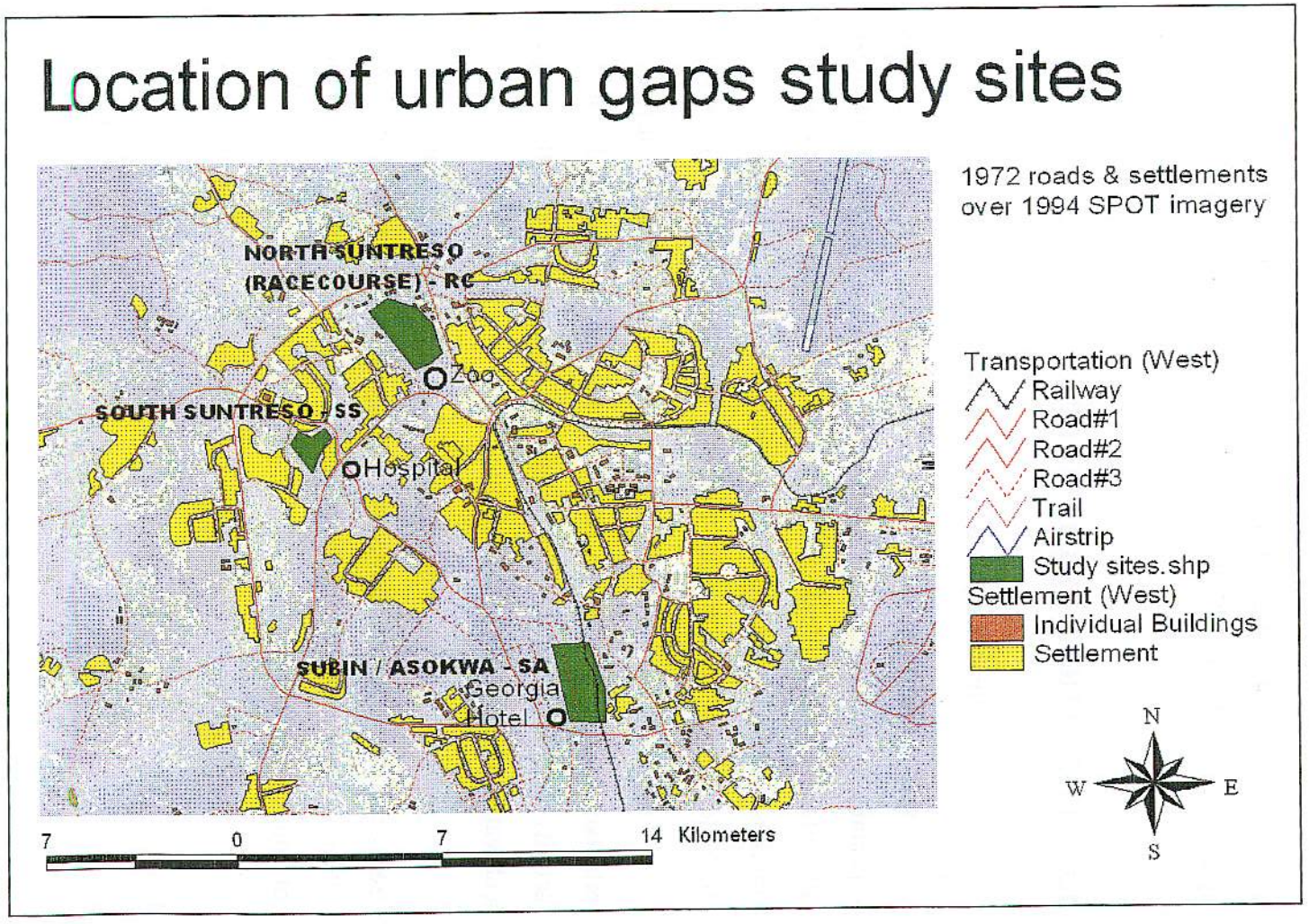
MAPPING OF PLOTS (Subin Asokwa & South Suntreso)

2-10-99
5-10-99
8-10-99
9-10-99
18-10-99 19-10-99

The field survey work was carried out by Patrick Kumordzie and Mrs. Agbenyega under the guidance of Mr. Adam.

The location of the three study sites is shown on figure 1 following.

Figure 1. Location of urban gaps study sites



1.2.3 ***Data recording***

Outlines of the farm plots were recorded in the field on ADP images by Mrs. Agbenyega and Patrick Kumordzie and digitised onto the images held on the computer at IRNR by Mr. Kingsley Boateng.

Results of the field survey work were entered onto an Access database by Patrick Kumordzie. This database has been made available to the KUMINFO GIS programme held jointly at the NRI and the IRNR, together with the digitised outlines and images. Information about each plot, and overall data for the survey, can be called up as themes within KUMINFO.

1.3 LIMITATIONS OF THE STUDY

Serious setbacks and handicaps encountered include:

(a) Unwillingness of some individuals to respond to the questionnaire, especially in the North Suntreso/Race Course gap, for reasons unknown, perhaps attributable to some illegal activities such as smoking of marijuana and carving of unlicensed timber in the area. This resulted in fewer respondents. Also an area had to be visited several times in order to meet a representative number of respondents;

(b) It was observed that some respondents found it difficult and/or were reluctant to give information on the capital and training needed to enter into the activity and this hindered the estimation of appropriate total cost per unit area cultivated and intensity of the activity;

(c) Information on inputs used, crop protection measures and care given to tree components, if any, seemed to be exaggerated. This made the recorders sceptical when respondents claimed to water tree seedlings while at the same time complained of flooding in the area.

Despite these limitations, the study however achieved its main objectives.

2.0 SOUTH SUNTRESO URBAN GAP - CROP PRODUCTION

This is a small open area between North and South Suntreso which lies in the north-west portion of the Kumasi city/Metropolis. The crop production characteristics presented here is based on a data collected from a sample of twenty-one (21) respondents. On a later survey a twenty-second farmer, with a plot surrounded by others', was met. No data were however collected from him (plot 22).

The location of the farm plots is shown in figure 2 (following page). '-

2.1 THE CULTIVATOR/GATHERER

Cultivation is the main activity of the respondents and are wholly tenant - farmers. The amount of gathering in the study area is not significant.

2.1.1 Sex and Age Distribution

The sex of the respondents is shown in Table 2.1a. 81 per cent of the respondents are males, while 19 per cent female. Age varied from under 30 to over 70 years. The majority of respondents (47.6%) are middle aged (31 - 50 years), 19.1 per cent are just above the middle-aged class (51 - 70 years), 14.3 per cent are above 70 years whereas 19.1 per cent are below 30 years (Table 2.1b).

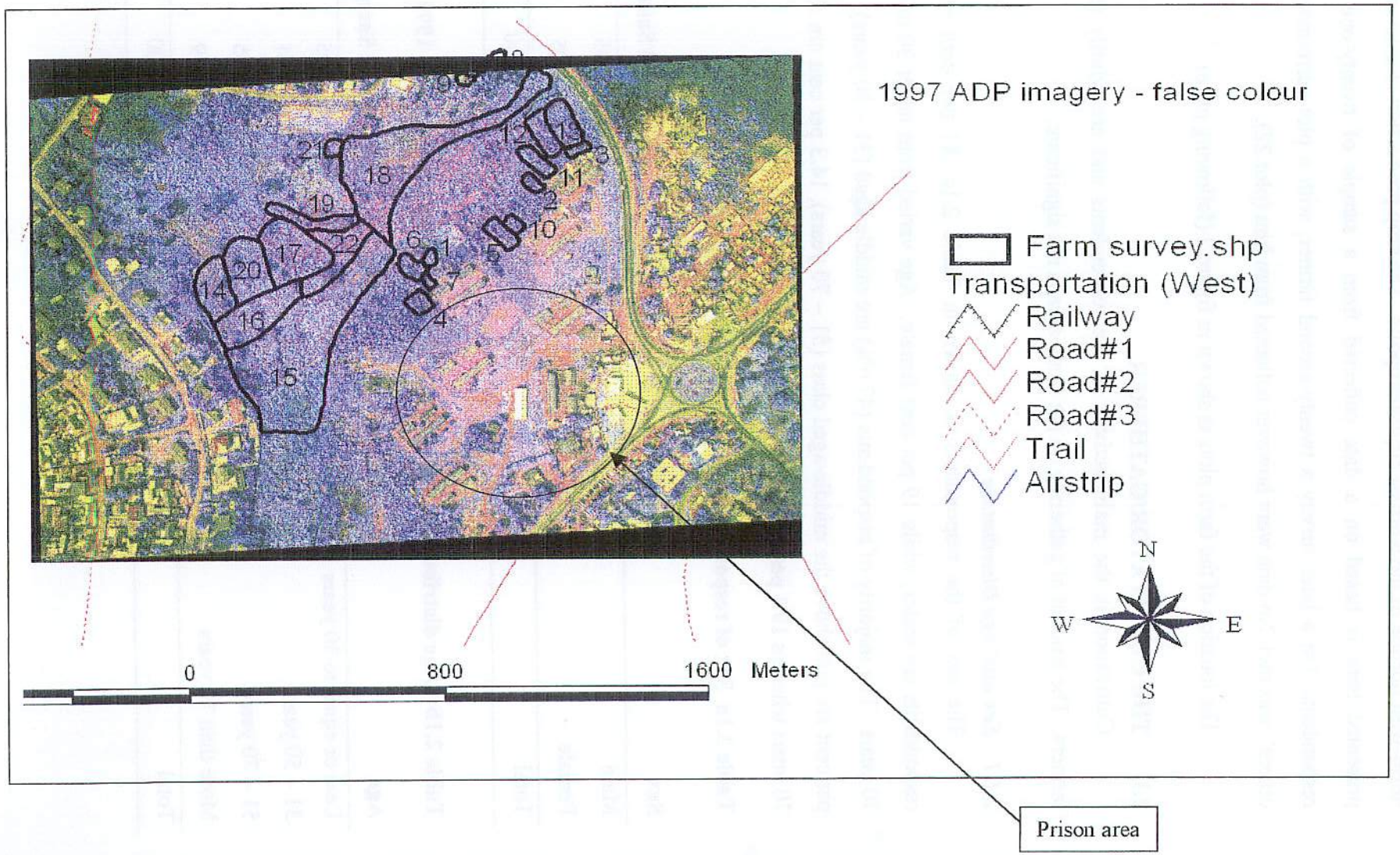
Table 2.1a Sex of respondents in the South Suntreso gap -1999

Sex	Number of respondents	% of Total Sample
Male	17	80.95
Female	4	19.05
Total	21	100.00

Table 2.1b: Age distribution of respondents in the South Suntreso gap -1999

Age	Number of respondents	% of Total Sample
Less or equal to 30 years	4	19.05
3 1 - 50 years	10	47.61
5 1 - 70 years	4	19.05
More than 70 v.-ars	3	14.29
Total	21	100.00

Figure 2. Location of farm plots in S. Suntreso study area



2.1.2 ***Household Size***

The distribution of household size is shown in Table 2.3. It shows 38.1% of medium household sizes (5-7 persons). This notwithstanding, there is also a sizeable proportion (33.3%) of higher number of persons (8+) per household. Only 28.6% of the respondents had small (less than or equal to 4 persons) household size. The number of family members ranged from 1 - 21 with the average size estimated to be 6.6. An average household had a size of 3 - 10 members, comprising the husband with one or more wives, their children and other dependents - nephews, in-laws, brothers, or sisters, mothers or fathers, etc. This confirms the existence of the traditional African extended family.

Table 2.3: Household size of respondents in the South Suntreso gap -1999

Number of persons	**Number of respondents**	**% of Total Sample**
Small (less or equal to 4 persons)	6	28.57
Medium (5 - 7 persons)	8	38.10
Large (more or equal to 8 persons)	7	33.33
Total	21	100.00
Household size range: 1 - 21		
Average household size: 6.6 ± 4.1		

2.1.3 Educational Background of Respondents

Table 2.4: Educational Background of Respondents in the South Suntreso gap -1999

Level	**Number of respondents**	**% of Total Sample**
Tertiary	1	47.76
Secondary	5	23.81
Middle/JSS	9	42.86
No formal education	6	28.57
Total	21	100.00

The educational status of respondents is depicted in Table 2.4. A large proportion (71.4%) of respondents have received some sort of formal education. This comprises 4.8% tertiary education; 23.8% attended Secondary school; while about

42.9% had Post-primary (Middle/JSS) education, appreciable proportion (28.6%) however received no formal education and are illiterates.

2.1.4 ***Occupational Distribution***

Table 2.5 shows the major occupation of respondents. The majority of the interviewees (57.9%) are employed in the Public/Civil services, who are mostly Prison officers (28.6%), Labourers (19.0%), Watchmen (4.8%) and Secretaries (4.8%). About 14.3 percent are retailers/traders, another 14.3% are full-time farmers, while 9.5% per cent are Artisans and 4.8% are Priests.

Table 2.5: Occupational distribution of respondents in the South Suntreso gap -1999

Type of occupation	Number of respondents	% of Total Sample
Prison officer	6	28.57
Labourer	4	19.05
Retailer/Trader	3	14.29
Farmer	3	14.29
Artisan	2	9.52
Watchman	1	4.76
Secretary	1	4.76
Priest	1	4.76
Total	21	100.00

2.1.5 ***Ethnic Origin: of Respondents***

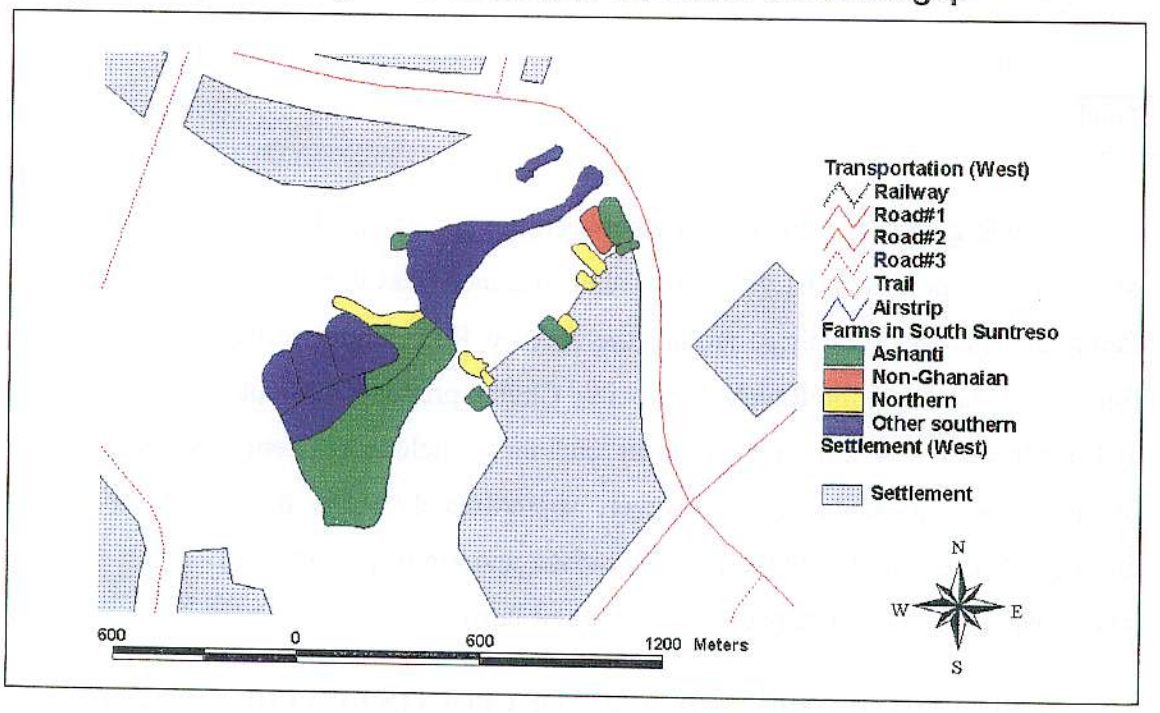
While 33.3% of respondents have their origin in Ashanti, another 33.3% come from Upper East Region. About 14.3% hail from Volta while 4.8% come from Brong Ahafo, another 4.8% from Central Region, further 4.8% from Eastern Region and also recorded 4.8% of respondents were non-Ghanaian (Table 2.6).

Table 2.6: Ethnic origin of respondents in the South Suntreso gap – 1999

Region	Number of respondents	% of Total Sample
Ashanti	7	33.3
Upper East	7	33.3
Volta	3	14.30
Brong Ahafo	1	4.76
Central	1	4.76
Eastern	1	4.76
Non-Ghanaian	1	4.76
Total	21	100.00

Figure 3 (following page) shows that in this area the Ashantis and other southerners predominate whilst the northerners and the non-Ghanaians for the most part have only small plots.

Figure 3. Ethnic origins of farmers in the South Suntreso gap



2.1.6 Number of Years Resident in Kumasi and Dwelling Place of Respondents

Most of the respondents (57.1%) had resided in Kumasi for a short period (less than 10 years). However, 23.8% have stayed in Kumasi for an appreciably long period (31 – 50 years). Only 9.5% of respondents have lived in the Metropolis for a

long period (11 - 30 years), similar proportion 9.5% have also stayed in the Kumasi city for a very long period (more than 51 years). See Table 2.7a.

Table 2.7a: Number of years resident in Kumasi in the South Suntreso gap -1999

Period	Number of Respondents	% Total Sample
Short (less than 10 years)	12	57.15
Long (11 - 30 years)	2	9.52
Appreciably long (31 - 50 years)	5	23.81
Very long (51+ years)	2	9.52
Total	21	100.00

Table 2.7b: Location of dwelling of residents in the South Suntreso gap -1999

Distance from farm	Number of respondents	% of Total Sample
Less than 1 km	13	61.91
1 - 4 km	4	19.05
5 - 8 km	2	9.52
Above 9 km	2	9.52
Total	21	100.00

Table 2.7b shows the distance between the homes and farms of respondents. Majority of respondents (61.9%) take a short distance (less than a kilometre) to their farms and this involves those around the Bekwai Roundabout through the Prisons Barracks to the Apostolic Revelation Society Church premises. About 19.1% traverse a distance of 1 - 4 km to their farms and these include residents around North Suntreso and similar radius. However, approximately 9.5% travel over a long distance (5 - 8 km) i.e. those from Kwadaso and similar radius and further 9.5% travel over a very long distance (9+ km) to their farms.

2.2 CROPPING HISTORY AND PLACE OF CROPS IN LIVELIHOOD SYSTEM

2.2.1 Previous Cultivators and Crops Growth

Fifty-two per cent of respondents had plots with previous owners. The majority, (64%) out of this number are aware of one previous cultivator while 18% are aware of two. Knowledge of three previous cultivators was stated by 9% and further 9% mentioned five persons. Another 48% of respondents however, had no knowledge of previous cultivators (Table 2.8a and 2.8b).

Table 2.8a: Knowledge of previous cultivator in the South Suntreso gap

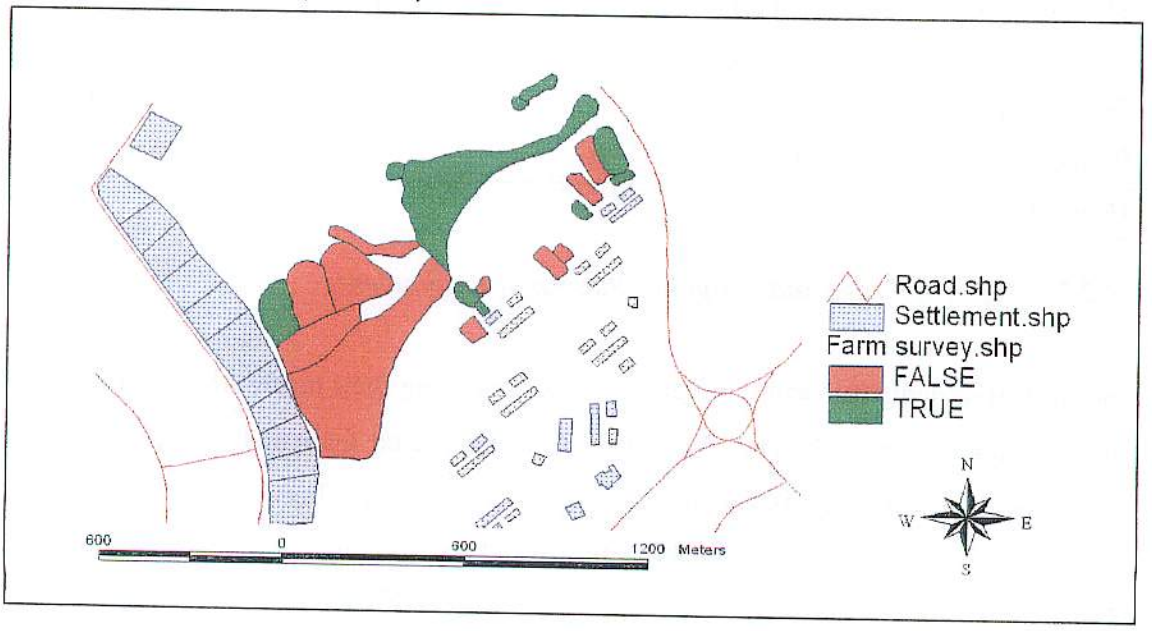
Response	Number of respondents	% of Total Sample
Yes	11	52.38
No	10	47.62
Total	21	100.00

Table 2.8b: Number of previous cultivators per plot in the South Suntreso gap - 1999

Number of cultivators	Number of Respondents	% Total Sample
1	7	63.64
2	2	18.18
3	1	9.09
4	0	0.0
5+	1	9.09
Total	11	100.00

Figure 4 illustrates that most of the older established plots are mostly to the north (upstream end) of the gap area and in the vicinity of the houses, mainly prison quarters.

Figure 4. Previously cultivated farms ("true") and farms opened by the present cultivator ("false")



Fifty-five per cent of previous cultivators grew sugar-cane, of which the greater proportion is sold followed by okro (30%) while garden eggs, maize and banana/plantain have been cultivated by 27% each of the previous cultivators. About

18% each cultivated cassava, cocoyam and water cocoyam (taro) respectively, and sweet potato, yam, coconut, pawpaw, oil palm and leafy vegetables such as amaranthus, jute, cabbage, and lettuce ranked least with 9% each with previous cultivator (Table 2.8c).

Table 2.8c: Types of crops cultivated by previous cultivators in the South Suntreso gap -1999

Scientific name	Common name	Number of respondents	% of Total Sample
Saccharum ofcinarum	Sugar-cane	6	54.55
Hibiscus esculentum	Okro	4	36.36
Zea mays	Maize	3	27.27-
Solanum spp	Garden eggs	3	27.27
Musa spp.	Banana / Plantain	3	27.27
Manihot esculentum	Cassava	2	18.18
Xanthosoma sagittifolum	Cocoyam	2	18.18
Colocasia esculenta	Water cocoyam (taro)	2	18.18
Amaranthus sp.	Amaranthus (Alefi)	1	9.09
Brassica capitata	Cabbage	1	9.09
Cocos nucifera	Coconut	1	9.09
Corchorus olitorius	Jute (Ayoyo)	1	9.09-
Lactuca Sativa	Lettuce	1	9.09
Elaeis guiniensis	Oil palm	1	9.09
Carica papaya	Pawpaw	1	9.09
Ipomoea batatas	Sweet potato	1	9.09-
Dioscorea alata	Yam	1	9.09
Total number of respondents	=	11	

2.2.2 Types of Crops and Cropping Pattern of Respondents

So far respondents (present cultivators) have been using their pieces of land from less than a year to over 21 years. Majority (57%) have used their plots for 1 - 5 years while 14% had used theirs for over 21 years. The land has been utilized within the period of 6 - 10 years and 16 - 20 years by 10% of respondents respectively, while 5% used the plot between 11 and 15 years and further 5% for less than a year (Table 2.9a).

Table 2.9a: Length of cultivation of plot by present farmers/respondents in the South Suntreso gap - 1999

Period	Number of respondents	% of Total Sample
Less than 1 year	1	4.76
1 - 5 years	12	57.14
6 - 1 0 years	2	9.52
11 - 15 years	1	4.76
16 - 20 years	2	9.52
21 + years	3	14.30
Total	21	100.00

Respondents did not differ so much on the range but in the amounts of crops cultivated (Table 2.9b) when compared with the previous cultivators (Table 2.8c). Majority, (95%) have interest in banana/plantain while 57% in cassava, 52% in taro and 48% in maize. Further 43% are interested in sugar-cane, 33% in oil palm, 29% in cocoyam and its leafy vegetables (kontomire) and similar proportion (29%) in leafy jute/'Ayoyo'. 24% of respondents cultivate leaf amaranthus/'Alafi', another 14% grow garden eggs, while 10% harvest some mango fruits and further 5% cultivate cabbage, coconut, pawpaw, pepper, sour sop fruits and yam respectively.

Thus the present cultivators are generally more interested in bananas, plantain, cassava and taro than their predecessors, who concentrated on sugar-cane, maize and vegetables. This suggests a trend towards crops which can be used as staple foods as well as for cash, and a greater perception of the need for food security.

Table 2.9b: Types of crops grown by cultivators in the South Suntreso gap

Scientific name	Common name	Number of respondents	% of Total Sample
Musa spp.	Banana/plantain	20	95.24
Manihot esculentum	Cassava	12	57.14
Colocasia esculenta	Water cocoyam (taro)	11	52.38
Zea mays	Maize	10	47.62
Saccharum ofcinarum	Sugar-cane	9	42.86
Elaeis guineensis	Oil palm	7	33.33
Xanthosoma sagittifolium	Cocoyam/kontomire	6	28.57
Corchorus olitorius	Leafy jute (ayoyo)	6	28.57
Amaranthus sp.	Leaf amaranthus (alefi)	5	23.81
Solanum sp	Garden eggs	3	14.29
Mangifera indica	Mango	2	9.52
Brassica capitata	Cabbage	1	4.76
Cocos nucifera	Coconut	1	4.76
Carica papaya	Pawpaw	1	4.76
Capsicum frutescens	Pepper	1	4.76
Annona spp.	Sour sop	1	4.76
Dioscorea alata	Yam	1	4.76
Total number of respondents	=	21	

Figure 5 shows that sugarcane is presently grown by the larger plot holders in the central part of the "gap". The distribution of other crops is not so obviously restricted.

Figure 5. Farms in the SS gap growing sugarcane ("true")

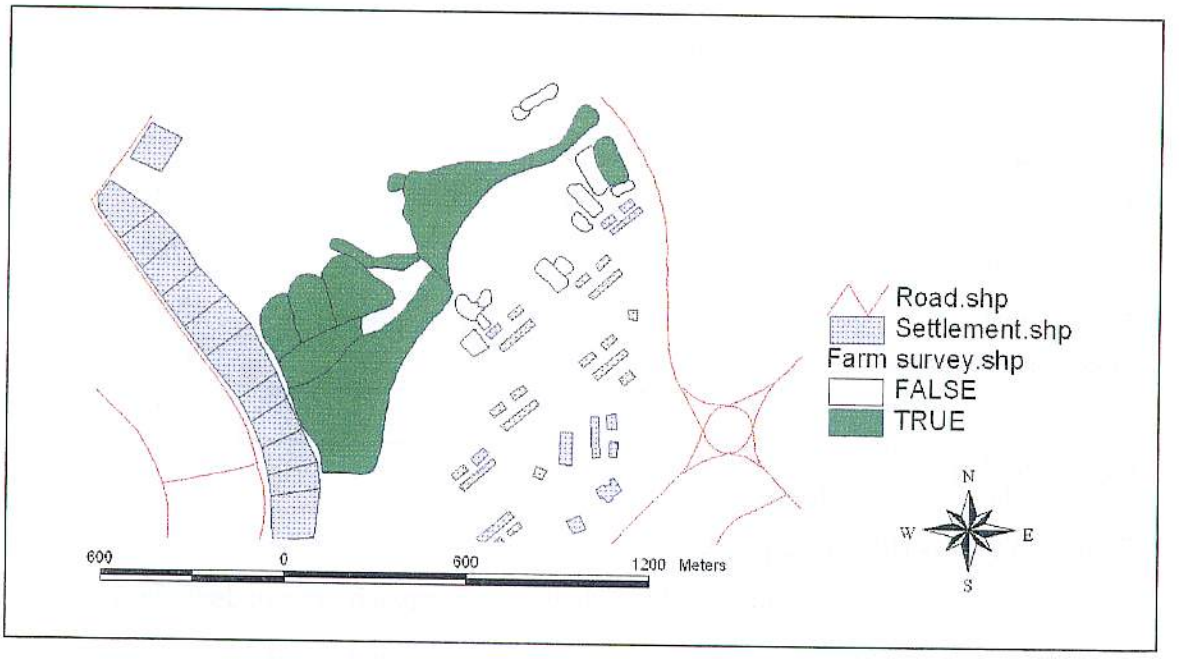


Table 2.9c shows the cropping pattern of respondents. Because cultivation is purposely on supplementary basis, majority of respondents (86%) practice multiple cropping on their plots. About 10% however, exercise multiple cropping on rotational basis while 5% strictly practice mono-cropping.

Table 2.9c: Cropping Pattern of Respondents in the South Suntreso gap – 1999

Pattern	Number of respondents	% of Total Sample
Multiple cropping	18	85.72
Multiple & rotational	2	9.52
Mono-cropping	1	4.76
Total	21	100.00

2.2.3 Area of Plot cultivated and Reasons for Farming

Land holdings are comparatively small in the study area and range between half an acre to five acres. Table 10a illustrates this. About 57% hold land up to 1.5 acres, where half of this proportion (28.6%) have plots less than an acre and the other half (28.6%) between 1.0 – 1.5 acres. Approximately, 14.3% of respondents cultivate about 2.0 – 2.5 acres and further 14.3% have relatively large (4.0 – 4.5 acres) plots. Very few (9.5%) holdings are very large (over 5.0 acres) while only 4.8% have between 3.0 – 3.5 acres which mediate between the small and large plot sizes.

Table 2.10a: Size of Plots/farms of Respondents in the South Suntreso gap

Size	Number of respondents	% of Total Sample
Less than 1.0 acre	6	28.57
1.0 - 1.5 acres	6	28.57
2.0 - 2.5 acres	3	14.29
3.0 - 3.5 acres	1	4.766
4.0 - 4.5 acres	3	14.29
More than 5.0 acres	2	9.52
Total	21	100.00

Range of holding: 0.1- 5 acres
Average holding: 2.0 acres

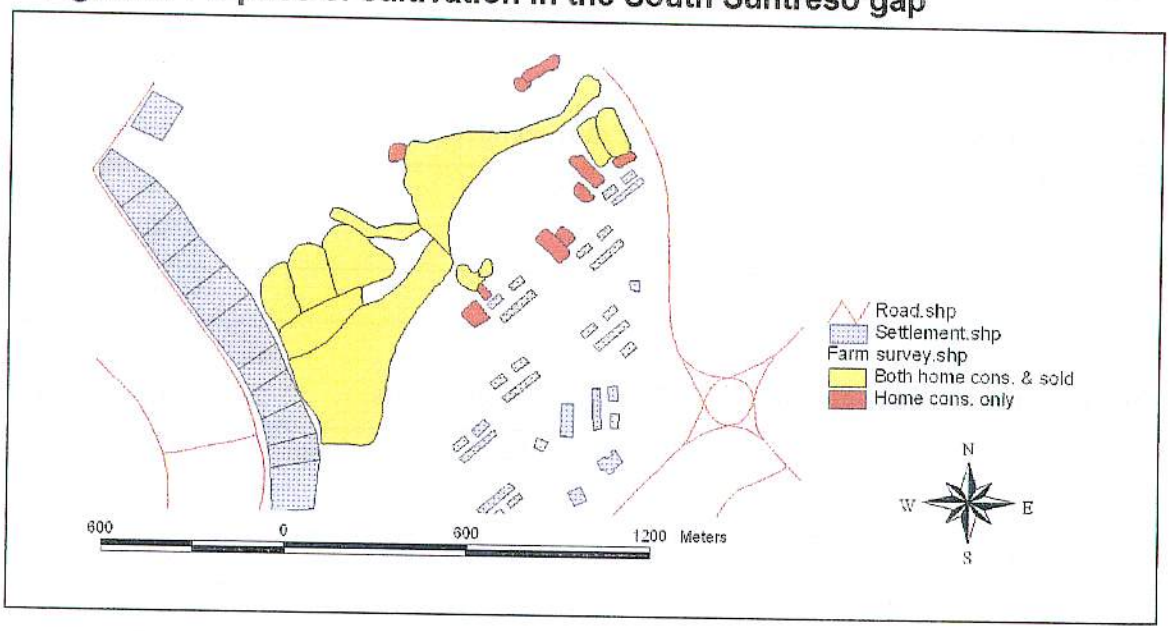
Significant proportion of respondents cited various financial reasons as the major reason for entering into farming. Table l Ob gives reasons why respondents farm in this particular gap. Out of the total sample, 57.1% mentioned that the activity is their source of income and food, while 33.3% farm to supplement their meals, and further 9.5% to improve food security. The underlying fact accounting for the high level of respondents citing financial reasons for farming is explained by the large proportion of total household income usually spent on food.

Table 2.10b: Reasons cited for farming by respondents in the S. Suntreso gap - 1999

Reason	Number of respondents	% of Total Sample
Serve as source of family income and food	12	57.14
Supplement household meals	7	33.34
Improve household food security	2	9.52
Total	21	100.00

Figure 6 shows that the larger, central plots are cultivated for dual purpose income and food whereas the smaller ones on the periphery are for food supplementation and security only. (The figure illustrates the answer to question D1 rather than question C4 as shown in table 2.10b).

Figure 6. Purpose of cultivation in the South Suntreso gap



2.2.4 *Other Agricultural Activities carried out by Respondents*

Almost 86% (18) of respondents have no other activity apart from crop cultivation. The rest of 14% who have other agricultural activities, 33% practice small scale backyard poultry, another 33% snail farming and further 33% have fish ponds alongside cropping.

2.3 TREE PLANTING AND MANAGEMENT

Most of the respondents (71.4%) have trees on their farms. About 66.7% out of this number intentionally planted the trees where sources of planting materials include private individuals/nursery (80%), open market (10%) and wildings (10%).

Seeds are predominantly (70%) used, followed by vegetative cuttings (30%) and seedlings constituted 20% of the planting materials used. The rest 33% who did not purposely grow these trees had wild seedlings on their farms which they managed.

These tree components serve both product (fruits of coconut, mango and sour sop) and service (shade of these trees) functions to about 46.7% of respondents. About 46.7% also managed these trees for only their products and another 26.7% for only the service function (shade).

While 46.7% purposely weed round these trees, 33.3% protected them from livestock damage, and 13.3% did both watering and weeding, where 6.7% gave these trees no special care during their early growth. Table 2.11 illustrates the tree planting arrangement and management by respondents.

Table 2.11: Tree planting and management by respondents in the South Suntreso gap -1999

(i) Trees on farm	Number of respondents	% of Total Sample
Yes	15	71.43
No	6	28.57
Total	21	100.00

(ii) Trees intentionally grown	Number of respondents	% of Total Sample
Yes	10	66.67
No	5	33.33
Total	15	100.00

(iii) Source of planting material	Number of respondents	% of Total Sample
Private individual	8	80.00
Market	1	10.00
Wilding	1	10.00
Total	10	100.00

(iv) Types of planting material used	Number of respondents	% of Total Sample
Seed	7	70.00
Vegetative cutting	3	30.00
Seedling	3	20.00
Total number of respondents	= 10	

(v) Care given at early stage of growth	Number of respondents	% of Total Sample
Weeding only	7	46.67
Protection from livestock damage	5	33.33
Watering and weeding	2	13.33
No care	1	6.67
Total number of respondents	= 15	

The large proportion who have planted trees suggested that, contrary to the typical peri-urban situation, they have a fair degree of confidence in the security of their tenure. However, the next section goes into this in more detail.

2.4 TENANCY AND SECURITY OF ACQUISITION OF PLOT

There is no strict tenancy agreement for users of the gap. It is assumed that these users rather keep this environment neat since they regularly clear the weeds. From Table 2.12, 38.1% of respondents stated that their piece of land belongs to the Prison Service Authorities while 28.6% claimed theirs belongs to the State Housing Corporation. However, about 23.8% of respondents indicated that the area in block belongs to the Government (hence KMA) and further 9.5% proved to be using portions belonging to private individuals. On how secured their holdings were (Table 2.12), majority of respondents (90.5%) claimed full security of their holdings unless the area is to be used for new developments by the stated owners. The rest 9.5% however, indicated a change in tenant/land if their portion is not used to the satisfaction of the prospective owners.

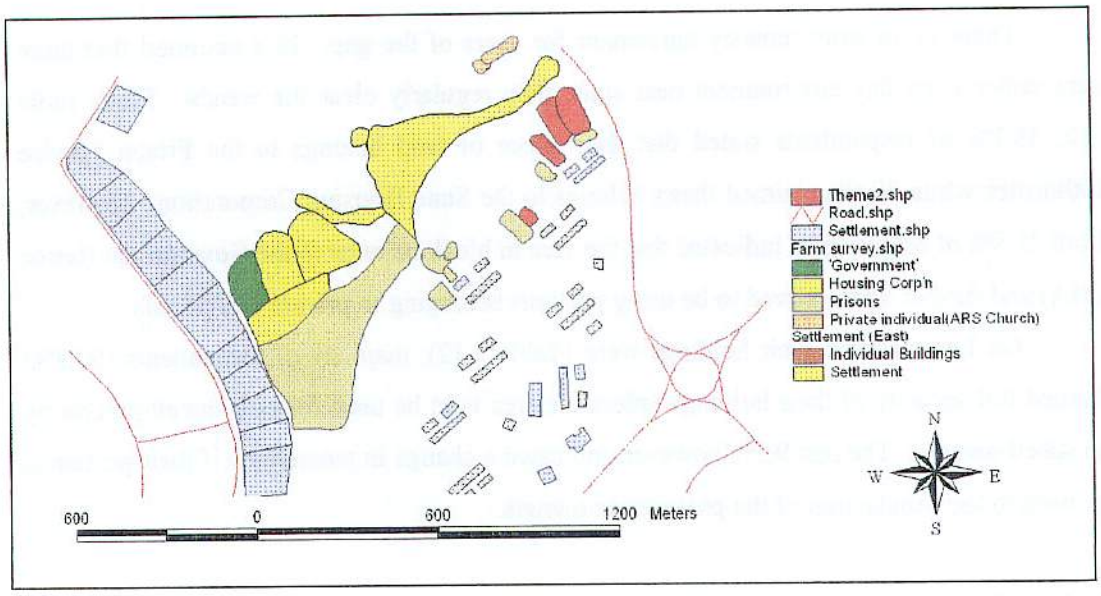
Table 2.12: Land ownership and security of holding of respondents in the South Suntreso gap -1999

(i) Land ownership	**Number of respondents**	**% of Total Sample**
Prisons Service Authority	8	38.10
State Housing Corporation	6	28.57
Government	5	23.81
Private individual	2	9.52
Total	21	100.00

(ii) Land security	**Number of respondents**	**% of Total Sample**
Well secured	19	90A8
Not secured	2	9.52
Total	21	100.00

Figure 7 indicates that, of those on "government" land, four out of five feel a measure of insecurity, which is not the case with other landlords.

Figure 7. Insecurity on government land (in red)



2.5 *HUSBANDRY PRACTICES*

2.5.1 *Inputs and Crop Protection Measures*

Greater proportion of respondents (71%) used no inputs in their type of production. About 19% use chemical fertilizer bought from agro-chemical sellers while 5% use only manure from their backyard poultry or refuse dump and further 5% use both chemical fertilizer and manure on their crops (Table 2.13(i)).

Table 2.13(ii) illustrates the form of crop protection measures used. While 81% protect their crop by clean clear weeding, 14% do so by fencing round their plot/farm and the rest (5%) adopt chemical pest control measures.

Table 2.13: Inputs used and crop protection measures if respondents in the South Suntreso Gap – 1999

(i) Inputs	Number of respondents	% of Total Sample
No input	15	71.43
Only fertilizer	4	19.05
Only manure	1	4.76
Fertilizer and manure	1	4.76
Total	21	100.00

(ii) **Crop protection measures**	**Number of respondents**	**% of Total Sample**
Clean weeding	17	80.95
Fencing	3	14.29
Chemical pest control	1	4.76
Total	21	100.00

2.5.2 Cost of Labour and Use of Crop Residues By products

Only 33% (7) of respondents use paid labour for production, ranging from ¢36,000 - 0620,000 per annum. Out of this number, 43% spend about ¢51,000 - ¢200,000 while 29% use over ¢200,000 and another 29% use less than 050,000 on labour (Table 2.14a).

Majority of respondents (90.5%) leave crop residues after harvesting on their plots to decay as a means of soil amendment while 9.5% actually waste the residues by burning as a means of clearing the land (Table 2.14b).

Table 2.14a: Cost of Labour given by respondents in the South Suntreso Gap - 1999

Amount per annum	**Number of respondents**	**% of Total Sample**
Less than ¢50,000	2	28.57
051,000 - 0200,000	3	42.86
¢200,000+	2	28.57
Total	7	100.00

Table 2.14b: Disposal of crop residues by respondents in the South Suntreso gap -1999

Response	**Number of respondents**	**% of Total Sample**
Left on farm	19	90.43
Burnt	2	9.52
Total	21	100.00

2.6 ADVICE ON FARMING ACTIVITY

Though not frequent, only 24% of respondents had ever received advice on cropping. This includes 19.1% of respondents who had the advice from a relative or ordinary friend while the other 4.8% were advised by an Agricultural Extension Agent (AEA) who was also a friend (Table 2.15).

Table 2.15: Advice on production in the South Suntreso gap -1999

Response	Number of respondents	% of Total Sample
No Advice	16	76.19
A relative / ordinary friend	4	19.05
A.E.A	1	4.76
Total	21	100.00

2.7 MARKETING

2.7.1 Disposal of Produce

Respondents grow crops for home consumption, although a considerable number either distribute their surpluses to friends, relations and neighbours or sell them to other people. The study indicated that 52% (11) of respondents consume and sell their surplus to the market, while 48% (10) solely go into cultivation for subsistence consumption. No processing whatsoever, is done to produce sold direct at the farm gate.

The marketing preference of those who sell their surpluses is illustrated in Table 2.16. Greater proportion (64%) of respondents sell sugar-cane to the market. Eighteen per cent obtain income from the sale of cassava, another 18% from banana/plantain and further 18% sell excess taro produced. While 9% earn some income from selling leafy amaranthus/'alefi', similar proportion 9% also from leafy jute or `ayoyo' and another 9% sell garden eggs.

Table 2.16: Crop produce mainly sold in the market by respondents in the South Suntreso gap -1999

Scientific name	Common name	Number of respondents	% of Total Sample
Saccharum officinarum	Sugar-cane	7	63.64
Musa spp.	Banana/plantain	2	18.18
Manihot esculentum	Cassava	2	18.18
Colocasia esculentus	Water cocoyam (taro)	2	18.18
Amaranthus sp.	Leaf amarantus (alefi)	1	9.09
Corchorus olitorus	Leaf jute (ayoyo)	1	9.09
Solanum sp	Garden eggs	1	9.09
Corchorus olitorus			
Solanum sp.			
Total number of respondents		= 11	

2.7.2 Crop Consumption by Farming Household

Table 2.17a shows how crop produce are consumed at home where two or more of these crop produce are eaten per meal. From Table 2.17, 62% of respondents consume banana/plantain, cassava by 38%, maize by 28% and similar proportion (29%) of respondents consume taro. Ten per cent feed on `Alefi', another 10% cocoyam/kontomire, further 10% eat `Ayoyo' and similar proportion (10%) also use oil palm to prepare food. On the other hand, 5% use garden eggs, another 5% pepper in preparing their meals while further 5% eat mango fruits and other 5% of respondents chew sugar-cane at home.

In terms of proportion of total crop produced consumed at home (Table 2.17b) 48% of respondents (as already stated in 2.7. 1) consume all (100%) and 14% consume 20% of total produce. About 10% of respondents take in about $^{8}/_{10}$", $^{7}/_{'o}$" and one-tenth respectively of their total produce for home consumption and further 5% consume $^{4}/_{10}$ and $^{3}/_{10}$ of total produce respectively at home.

Table 2.17a: Crop produce mainly consumed by respondents in the South Suntreso Gap -1999

Scientific name	**Common name**	**Number of respondents**	**% of Total Sample**
Musa spp.	Banana/plantain	13	61.90
Manihot esculentum	Cassava	8	38.10
Zea mays	Maize	6	28.57
Colocasia esculentus	Water cocoyam (taro)	6	28.57
Amaranthus sp.	Amaranthus leaf	2	9.52
Xanthosoma sagittifolium	Cocoyam/kontomire	2	9.52
Corchorus olitorus	Jute leaf (ayoyo)	2	9.52
Elaeis guineensis	Oil palm	2	9.52
Solanum spp	Garden egg	1	4.76
Mangifer indica	Mango	1	4.76
Capsicum trutescens	Pepper	1	4.76
Saccharum officinarum	Sugar-cane	1	4.76
Total number of respondents		= 21	

Table 2.17b: Total crop produce for home consumption by respondents in the South Suntreso Gap -1999

Proportion consumed	Percentage of total produce	Number of respondents	% of Total Sample
10/10	100	10	47.62
2/10	20	3	14.30
8/10	80	2	9.52
7/10	70	2	9.52
1/10	10	2	9.52
4/10	40	1	4.76
3/10	30	1	4.76
Total number of respondents		= 21	

2.8 ENTRY AND PROFITABILITY OF ACTIVITY

2.8.1 Entry into Activity

Table 2.18 represents respondents entry into farming activity in the gap. Out of the total sample, 38.1% have pleasure in farming hence enter the activity in the gap as a hobby. About - 19.1% revealed that they have enough land available around their premises and hence wish to utilize it. Further 19.1% claimed they were advised (by friends/parents) to go into the activity - while another 19.1% took over from previous owners (relatives, parents, friends, etc). Only 4.8% of the respondents thought of improving the environmental quality of the landscape by entering into the activity. The reason was to stop a refuse/rubbish dump being created in the area.

Table 2.18: How respondents in the South Suntreso gap entered into the activity -1999

Response	Number of respondents	% of Total Sample
Have pleasure in farming (hobby)	8	38.09
Have enough land at the premises	4	19.05
Was advised into activity	4	19.05
Took over from previous owner	4	19.05
To enhance environmental quality	1	4.76
Total	21	100.00

2.8.2 Duration of training and Capital requirements

From Table 2.19a, an appreciable proportion (57.1%) of respondents do not see the need for any training to usher a new entrant into the activity. Others (42.9[1]/o) however, hold the view that initial training is important to equip a new entrant. Varied periods of training were indicated (Table 2.19b) by those who saw the need depending on the type of crop and cropping intensity. About 55.6% out of this total expressed the need for less than a month's training, while 22.2% said up to about six months training is needed for the activity. Whereas 11.1% claimed a maximum of five years is ideal, further 11.1% indicated over five years is enough to equip the new entrant for the activity.

Majority of respondents (66.7%) interviewed indicated that an amount of up to ¢50,000 was used to enter this activity. Approximately 23.8% used about ¢51,000 - ¢200,000 to start, while further 9.5% of respondents used over ¢200,000 to initiate the farming activity (Table 2.19c).

All respondents (100%) stated that the activity either makes one spend less of the household income on family's food or leads one to earn some income or both. This is a good indication of a profitable venture hence the activity is profitable.

Table 2.19a: Training needs of respondents in the South Suntreso gap -1999

Need for Training	Number of respondents	% of Total Sample
No	12	57.14
Yes	9	42.86
Total	21	100.00

Table 2.19b: Duration of training for new entrants in the South Suntreso Gap -1999

Period	Number of respondents	% of Total Sample
Less than 1 month	5	55.56
1 month - 6 months	2	22.22
7 months - 1 year	0	0.00
1.5 years - 5 years	1	11.11
Over 5 years	1	11.11
Total number of respondents	= 9	100.00

Table 2.19c: Initial capital needed for farm in the South Suntreso gap -1999

Amount	Number of respondents	% of Total Sample
Less than or equal to ¢50,000	14	66.67
051,000 - 0200,000	5	23.81
More than ¢200,000	2	9.52
Total	21	100.00

2.9 CONSTRAINTS TO PRODUCTION AND CHANGES IN ACTIVITY

2.9.1 Constraints Facing Farmers

Certain constraints (Table 2.20) associated with production and crop growth, development and yield were identified by 76.2% (16) of respondents but 23.8% did not identify any. Constraints on production (62.5%) peculiar to the fact that the activity is carried out in Kumasi Metropolis include, theft of produce, 25%; inadequacy of labour, 12.5%; defecation and dumping of refuse/rubbish on farm, 12.5%; browsing of roaming and stray livestock, 6.3%,; and insufficient land hence conflict over landownership, 6.3%. However, there were no complaints from neither the residents nor Kumasi Metropolitan Authorities (KMA) about this type of activity in the gap.

Insufficient funds (Table 2.20) for farming constitute 25% of the constraints to production. About 18.8% of respondents reported flooding during the rainy season which persists even during the short spell of drought, as serious environmental problems affecting crop choice and reduce yield considerably. Another 18.8 face diseases and pests damage on crops while 6.3% attributed poor growth, development and yield of crop to wanton weed infestation and further 6.3% of respondents blame it on poor soil fertility.

Table 2.20: Problems and constraints associated with crop production in the South Suntreso gap -1999

Type of constraint	Number of respondents	% of Total Sample
Insufficient funds	4	25.00
Theft of produce	4	25.00
Flood hazards	3	18.25
Disease/pest damage	3	18.25
Labour shortage	2	12.50
Defecation/refuse dumping in farm	2	12.50
Livestock damage on crops	1	6.25
Land ownership / conflict	1	6.25
Poor soil fertility	1	6.25
Weed infestation	1	6.25
Total	16	100.00

Table 2.21: Suggestions on improving production in the South Suntreso Gap -1999

Response	Number of respondents	% of Total Sample
Avail financial resources to farmers	10	47.62
Avail adequate fertilizer, manure, etc.	3	14.29
Advise on farm management	3	14.29
Avail more land	2	9.52
Measures to control flooding	1	4.76
Access to more labour	1	4.76
Flood fencing	1	4.76
Total	21	100.00

2.4.2 Improving Production

According to Table 2.21, an appreciable number (47.6°/x) of respondents are of the view that when more financial resources are made available, production will improve but 143% stated that availability of inputs (fertilizer, manure, etc.) will be sufficient and another 14.3% mentioned that just advice on how to manage farms will faring about improvement in production. While 9.5% of respondents suggested that more land should be made available, 4.8% proposed measures to control flooding would improve production in the gap. Another 4.8% stated availability and access to labour will be helpful while further 4.8% thought of provision of good fencing round their farms will very much go a long way to improve production in the gap.

2.9.3 Changes in Production and Marketing

Surprisingly, 42,9% declared their ignorance of a change. They have not recognized any change in production within the last 15 years. From Table 2.22a. 33% of respondents claimed there was an increase in production and 6.5% indicated a decrease. While 4.8% proved that there is a decrease in soil fertility in the gap, another 4.8% reported that flooding is now worse, compared to the past 15 years and another 4.8% did not realize any appreciable change in production.

This should be contrasted with the changes in cropping patterns indicated between the previous and present plot cultivators (see 2.2.2).

In terms of marketing (Table 2.22b) majority cannot tell whether there is a change since they produce on subsistence consumption. While 19.1% recognised an appreciable improvement in marketing by way of good price and expanded marketing avenue, 14.3%

claimed low prices are offered for their produce compared to the past 15 years. About 9.5% reported no changes in marketing within the past 15 years.

Table 2.22a: Changes in crop production within the last 15 years in the South Suntreso gap -1999

Response	Number of respondents	% of Total Sample
Ignorant of change	9	42.86
Increase in production	7	33.34
Decrease in production	2	9.52
Decrease in soil fertility	1	4.76
Flooding worse of	1	4.76
No change	1	4,76
Total	21	100.00

2.9.4 Changes in Number of Enterprises in the South Suntreso Gap

Assessing the farming enterprise in the study area, 90.5% of total respondents recognised an appreciable increase in the number of enterprises in the gap (Table 2.23a) while9.5% stated the opposite. The farming enterprise is increasing because more people want to minimize their expenses on food (Table 2.23b) stated by 45.0% of respondents. The evidence of high pressure of existing low salaries and wages of workers who have more mouths to feed from their limited financial resources; 40.0% of respondents saw it as lucrative and a source of the household food, hence the reason for its expansion. About 5.0% attributed the expansion to the fact that respondents obtain fresh and high quality produce from their own farm and further 5.0% claimed that expansion was due to the ready market available in recent times. However, 9.5% of respondents (as in Table 2.23a) stated that decrease in enterprises was due to land scarcity in the study area.

Table 2.22b: Changes in marketing *of* produce within the past 15 years in the South Suntreso Gap - 1999

Response	Number of respondents	% of Total Sample
Ignorant of change	12	57.14
Improved marketing avenues	4	19.05
Low prices offered for produce	3	14.29
No change	2	9.52
Total	21	100.00

Table 2.23a: Change in number of enterprises in the South Suntreso Gap -1999

Response	Number of respondents	% of Total Sample
Increasing	19	90.48
Decreasing	2	9.52
Total	21	100.00

Table 2.23b: Reason(s) for expansion/reduction of enterprises in the South Suntreso Gap -1999

Reasons	Number of respondents	% of Total Sample
People want to minimize expenditure on food	9	45.00
Lucrative and source of household food	8	40.00
Obtain fresh and high quality produce	1	5.00
Ready market for produce	1	5.00
Land is scarce	1	5.00
Total	20	100.00

2.9.5 Future Changes and Plans

Table 2.24 gives the expected changes in the South Suntreso gap. About 23.8% of respondents mentioned that production would increase in the future but 19.1% anticipated the fear of land scarcity and disputes in the future. This is because the existing farmers may like to expand their plots and other people would want to enter the enterprise due to the advantages accruing from the activity. Approximately 14.3% foresaw that the area might be put under estate development, another 14.3% indicated that the land could become flooded and be unsuitable for crop cultivation. Further 14.3% cannot imagine how there would be a future change since the system is stable, while other 14.3% of respondents cannot predict any change for the future.

Table 2.24: Expected future changes in activity in the South Suntreso Gap -1999

Response	Number of respondents	% of Total Sample
Production will increase	5	23.80
Land will be scarce and dispute	4	19.05
There will be estate development	3	14.29
Area will be flooded/unsuitable for crops	3	14.29
No future change	3	14.29
Cannot predict	3	14.29
Total	21	100.00

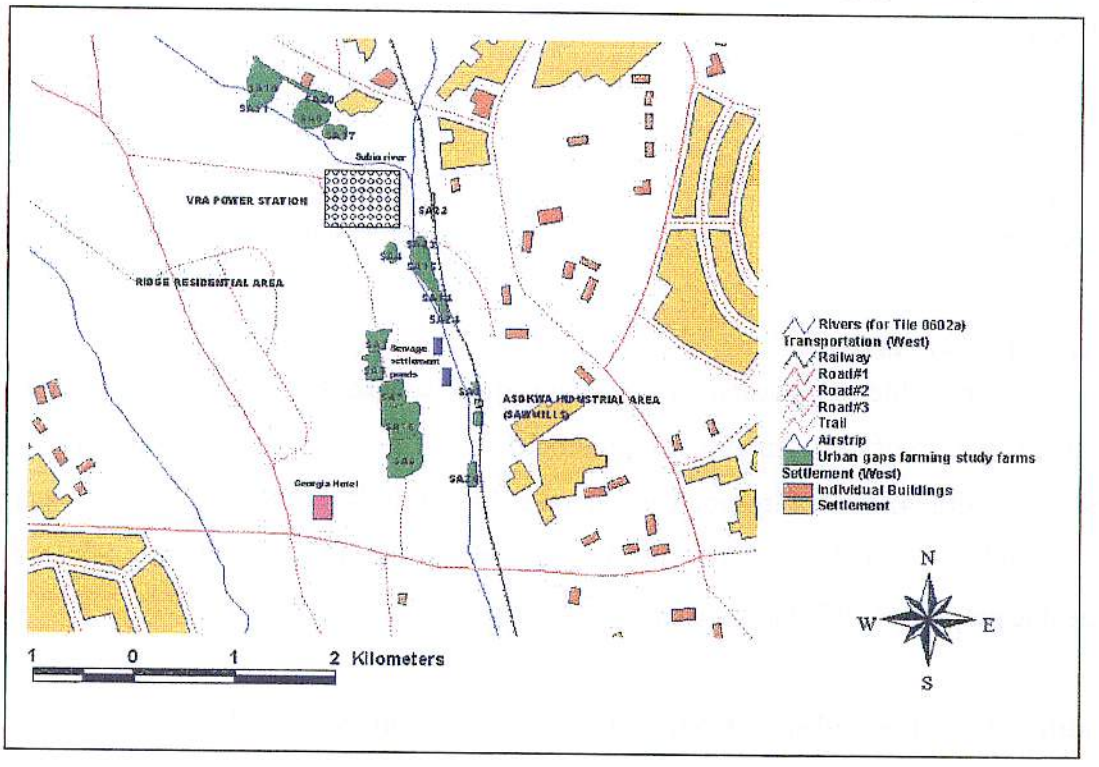
Respondents are of the view that new types and breeds of crops that are acceptable and adaptable to their environment should be introduced. They wish research could come out with appropriate methods of agricultural practices which could increase production and make it easier.

3.0 SUBIN/ASOKWA URBAN GAP CROP PRODUCTION

This is the gap lying in the southeast of the Kumasi city/metropolis. It includes the open areas around Asokwa residential (low density high-class housing), adjoining the industrial (mainly sawmilling) areas towards the railway line and Subin river. A selected sample size of twenty-six (26), as stated in Table 1, was used for the study. Based on the data collected, the crop production characteristics are presented.

The location of the plots and the environs of the area are shown in figure 8.

Figure 8. Plots surveyed & environs of Subin-Asokwa gap study area.



3.1 The Cultivator/Gatherer

Crop cultivation is the main activity of respondents in the study area who are tenant farmers.

3.1.1 Sex and Age Distribution

Respondents' sex is shown in Table 3.1a. The percentage sex ration in the sample is 23% female to 77% male. The ages of respondents varied from 28 years to 74 years (Table 3.1b). About 53.8% are middle-aged (31-50 years), 30.8% of respondents are just above the middle-aged class (51-70), while 11.5% are youths (less or equal to 30 years), the rest 3.9% are above 70 years of age.

Table 3.1a: Sex of respondents in the Subin/Asokwa Gap

Sex	Number of respondents	% of Total Sample
Male	20	79.92
Female	6	23.08
Total	26	100.00

Table 3.1b: Age distribution of respondents in the Subin/Asokwa Gap

Age	Number of respondents	% of Total Sample
Less or equal to 30 years	3	11.54
31 - 50 years	14	53.84
51 - 70 years	8	30.77
Above 70 years	1	3.85
Total	26	100.00

3.1.2 Household Size

From Table 3.2, household size of the study area ranges from 1 - 11 persons with an average of 6.4. An average household size of 3 - 9 persons is recognised in the area with 42.8% of respondents having higher number of persons (8+) per household. About 34.6% have medium household size (5 - 7 persons) while a sizeable proportion (23.1%) have small (< 4 persons) household size.

Table 3.2: Household size of respondents in the Subin/Asokwa Gap

No. of person(s)	Number of respondents	% of Total Sample
Large (8+)	11	42.31
Medium (5 - 7)	9	34.61
Small (< 4)	6	23.08
Total	26	100.00

Household size range: 1 -11
Average household size: 6.4 $\pm$ 3.1

3.1.3 Educational Background of Respondents

Formal education of some sort was received by 73.1 % respondents and the rest 26.9%had no formal education, hence areilliterates. The following are the stages of

education of the respondents (Table 3.3); Tertiary, 7.7%; secondary, 19.3%; Post-primary (Middle/JSS), 34.6% and Primary, 11.5%).

Table 3.3: Educational level of respondents in the Subin/Asokwa Gap

Level	Number of respondents	% of Total Sample
Tertiary education	2	7.69
Secondary education	5	19.23
Middle/JSS education	9	34.62
Primary education	3	11.54
No formal education	7	26.72
Total	26	100.0

3.1.4 Occupational Distribution of Respondents

Table 3.4 shows the major occupation of respondents. About 42.3% of respondents are labourers of either the Railway Corporation or the sawmills while 26.9% are full-time farmer (i.e. retired workers or self-employed). Approximately 7.7% of respondents are traders and artisans respectively while 3.9% are in the Police, Banking and Catering services respectively and another 3.9% are watchmen with the Ministry of food and Agriculture, Sawmills, etc.

Table 3.4: Occupation of Respondents in the Subin/Asokwa Gap

Occupation	Number of respondents	% of Total Sample
Labourer	11	42.31
Farmer	7	26.92
Trader	2	7.69
Artisan	2	7.69
Police	1	3.85
Banker	1	3.85
Caterer	1	3.85
Watchman	1	3.85
Total	26	100.00

3.1.5 Ethnic Origin of Respondents

Out of the total sample, 34.6% of respondents come from Upper East Region; 19.2% from Central while 15.4% hail from Ashanti, 11.5% of respondents are from Volta Region. About 7.7% are from the Upper West and Greater Accra Regions respectively. The Brong Ahafo Region recorded only 3.9% of respondents (Table 3.5).

Table 3.5: Ethnicity of Respondents in the Subin/Asokwa Gap

Region	Number of respondents	% of Total Sample
Upper East	9	34.62
Central	5	19.23
Ashanti	4	15.38
Volta	3	11.54
Upper West	2	7.69
Greater Accra	2	7.69
Brong Ahafo	1	3.85
Total	26	100.00

3.1.6 Number of Years Resident in Kumasi and Dwelling Place of Respondents

Table 3.6a illustrates that about 42.3% of respondents have lived in Kumasi for a long period (11.30 years); 38.5% for an appreciably long period (30 - 50 years) while 19.2% have been in the Kumasi metropolis for quite a short period (< 10 years).

Table 3.6a: Number of years resident in Kumasi (Subin/Asokwa Gap respondents)

Period	Number of respondents	% of Total Sample
Short (< 10 years)	5	11.23
Long (11 - 30 years)	11	42.31
Appreciably long (31 - 50 years)	10	38.46
Very long (50+ years)	0	0
Total	26	100.00

Table 3.6b: Distance to farm in the Subin/Asokwa Gap

Distance from home	Number of respondents	% of Total Sample
< 1 km	12	46.15
1 - 4 km	5	19.23
5 - 8 km	6	23.08
9+ km	3	11.54
Total	26	100.00

Table 3.6b depicts the distance respondents take to reach their respective farms. It is recognised that 46.2% of respondents are close (< 1 km) to their farms, while 23.1% have to walk 5 - 8 km before getting to their plots. About 19.2% of respondents take about 1 - 4 km distant and the rest 11.5% have to travel over 9 krn to their farms.

3.2 CROPPING HISTORY AND PLACE IN LIVELIHOOD SYSTEM

3.2.1 Previous Cultivator and Crops Grown in the Study Area

Fifty per cent of respondents have some knowledge on a maximum of one previous cultivator of their plots whereas the rest (50%) have records of none (Table 3.7a).

Table 3.7a: Knowledge of previous cultivators in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Yes	13	50.00
No	13	50.00
Total	26	100.00

Approximately 61.5% of these previous cultivators grew banana/plantain; 38.5% cultivated maize and sugar-cane respectively; 30.8%, cassava; 23.1%, taro; 15.7%, cocoyam with its vegetable (kontomire) and oil palm respectively; while cowpea was cultivated by 7.7% pepper by similar proportion (7.7%) of respondents and further 7.7% cultivated yam (Table 3.7b).

Table 3.7b: Types of crops by previous cultivators in the Subin/Asokwa Gap

Scientific Name	Common Name	Number of respondents	% of Total Sample
Musa spp	Banana/plantain	8	61.54
Zea mays	Maize	5	38.46
Saccharum offcinarum	Sugar-cane	5	38.46
Manihot esculentum	Cassava	4	30.76
Colocasia esculenta	Water cocoyam (taro)	3	23.08
Xanthosoma sagittifolia	Cocoyam	*2*	15.38
Elaeis guineensis	Oil palm	*2*	15.38
Vigna unguiculata	*Cowpea*	1	7.69
Capsicum annuum	Pepper	1	7.69
Dioscorea alata	Yam	1	7.69
Total Number of Respondents		= 13	

3.2.2 Types of Crops and Cropping Pattern of Respondents

Table 3.8a illustrates the period plots/farms have been cultivated by respondents. About 26.9% have been using the plots for the past 1 - 5 years, similar proportion ((26.9%) of respondents have used theirs for 6 - 10 years. Meanwhile, 11.5% of respondents have been using their plots for over 20 years, while 7.7% are cropping land for 15 - 20 years now and another 7.7% have cultivated their plot for almost a year.

Respondents however do no differ in the interest of the type of crop cultivated by their predecessors but they emphasized on diversification (Table 3.8b). Sixty nine per cent of respondents cultivate bananalplantain, maize, 42.3% of respondents; oil palm 38.5%; cocoyam/kontomire 34.6%, similar proportion (34.6%) cultivate sugar cane, while garden egg and okro respectively are grown by 30.8% of respondents. About 19.2% cultivate cabbage and 15.% of respondents cropped cowpea, pawpaw and pepper respectively. Other crop include: lettuce, spring onion, tomato and yam by 11.5% respectively; carrot, cucumber, green pepper, `Ayoyo' by 7.7%, and 3.9% of respondents cultivate `alefi', coconut, orange, avocado pear and sunflower respectively.

The above mentioned crops are grown in a multiple cropping pattern by 80.8% respondents. While 15.4% of respondents practice complete mono-cropping, the rest 3.9% do some sort of mono-cropping on rotational basis (Table 3.8c).

Table 3.8a: Length of cultivation of plot by respondents in the Subin/Asokwa Gap

Period	Number of respondents	% of Total Sample
Less than 1 year	2	7.69
1 - 5 years	7	26.92
6 - 10 years	7	26.92
11 - 15 years	5	19.24
16 - 20 years	2	7.69
Over 20 years	3	11.62
Total	26	100.00

Table 3.8b: Crops cultivated by respondents in the Subin/Asokwa Gap

Scientific Name	Common Name	Number of respondents	% of Total Sample
Musa spp	Banana/plantain	18	69.23
Zea mays	Maize	11	42.31
Elaeis guineensis	Oil palm	10	38.46
Colocasia esculenta	Water cocoyam (taro)	10	38.46
Xanthosoma sagittifolia	Cocoyam/kontomire	9	34.62
Saccharum officinarum	Sugar-cane	9	34.62
Solanum aethiopicum	Garden egg	8	30.77
Hibiscus	Okro	8	30.77
Brassica capitata	Cabbage	5	19.23
Vigna unguiculata	Cowpea	4	15.38
Carica papaya	Pawpaw	4	15.38
Capsicum annuum	Pepper	4	15.38
Launea sativa	Lettuce	3	11.54
	Spring onion	3	11.54
Lycopersicum	Tomato	3	11.54
esculentum	Yam	3	11.54
Dioscorea alata	Carrot	2	7.69
Daucus carota	Cucumber	2	7.69
Cucumis edulis	Green pepper	2	7.69
	Leafy jute (Ayoyo)	2	7.69
	Mango	2	7.69
Mangifera indica	Leafy amaranthus (alefi)	1	3.85
Amaranthus sp.	Coconut	1	3.85
Cocos nucifera	Orange	1	3.85
	Avocado pear	1	3.85
Persea americana	Sunflower	1	3.85
Helianthus spp			-
Total Number of Respondents		= 26	

Table 3.8c: Cropping pattern of respondents in the Subin/Asokwa Gap

Pattern	Number of respondents	% of Total Sample
Multiple cropping	21	80.77
Mono-cropping	4	15-38
Rotational cropping	1	3.85
Total	26	100.00

3.2.3 Area of Plot and Reason(s) by Respondents for Farming

Land holding is relatively small ranging from a quarter of an acre to six acres (Table 3.9a) with an average holding of about 2.2 acres. About 30.8% of respondents have plots of 1.0 - 1.5 acres, 19.2% hold less than an acre and another 19.2%, 2.0 - 2.5 acres. While a size of 4.0 - 4.5 acres is cultivated by 11.5% respondents, similar proportion (11.5%) use larger or equal to five acres and 7.7% have plot size about 3.0 - 3.5 acres.

From Table 3.9a, 57.7% of respondents enter into farming in the gap to earn income and get some food for the family while the other 42.3% farm as a means of supplementing the household meals.

Table 3.9a: Size holding of respondents in the Subin/Asokwa Gap

Size	Number of respondents	% of Total Sample
Less than 1.0 acre	5	19.23
1.0 - 1.5 acres	8	30.77
2.0 - 2.5 acres	5	19.23
3.0 - 3.5 acres	2	7.69
4.0 - 4.5 acres	3	11.54
More than 5.0 acres	3	11.54
Total	26	100.00

Range holding: 0.25 - 6.0 acres
Average holding: 2.24 acres 1.0 acre = 0.4 ha

Table 3.9b: Reason cited for farming by respondents in the Subin/Asokwa Gap

Reason	Number of respondents	% of Total Sample
Source of family income and food	15	57.69
Supplement household meals	11	42.31
Total	26	100.00

3.2.4 Other Agricultural Activities of Respondents

Almost 57.7% of respondents depend solely, in terms agricultural activity, on what they get from the plots in the gap. However, 42.3% (11) of respondents are involved in other small scale agricultural activities either in the gap or elsewhere. Out of this proportion, 45.5% have backyard poultry, 18.2% rear snails and another 18.2% have fish pond; while 9.1 % keep small ruminants (sheep and goats), further 9.1 % keep pigs (Table 3.10).

Table 3.10: Other Agricultural Activities of Respondents in the Subin/Asokwa Gap

Activity	Number of respondents	% of Total Sample
Poultry	5	45.46
Fishery	2	18.18
Snail	2	18.18
Small ruminants	1	9.09
Piggery	1	9.09
Total	11	100.00

3.3 Tree Planting and Management

Trees are found in the plots of 69.2% of respondents. These trees are intentionally planted by 61.1% of respondents who have them on plots. The source of the planting material is mainly (90.9%) from private nursery, however, for 9.1% the planting material is from the wilding (Table 3.11(i) - (iii).

The type of planting material abundantly used is the seed (81.8%), 45.5% of respondents made use of seedlings, while 27.3% use vegetative cutting for tree planting. Those who did not intentionally plant the trees, managed wild seedlings found on their farms (Table 3.11 (iv).

These trees serve only product functions to 50% of respondents and only service functions to 16.7%. However, 33.3% of respondents with trees on their farm enjoy both products and services functions from these trees (Table 11(v)).

Surprisingly enough, 22.2% of respondents gave no special care to trees on their farm. About 16.7% purposely weed round these trees, 27.8% weed round and protect the trees from livestock damage, and 5.6% actually weed and watered these trees; while 22.2% undertook all the three, that is weed, water and protect against livestock damage, and 5.6% also weed round, watered and protected these trees from bush-fires (Table 3.11 (vi}).

Table 3.11: Tree planting and management by respondents in the Subin/Asokwa Gap

(i) Trees on farm	Number of respondents	% of Total Sample
Yes	18	69.23
No	8	30.77
Total	26	100.00

(ii) Trees intentionally grown	Number of respondents	% of Total Sample
Yes	11	61.11
No	7	38.89
Total	18	100.00

(iii) Source of planting material	Number of respondents	% of Total Sample
Private individual	10	90.91
Wilding	1	9.09
Total	11	100.00

(iv) Types of planting material used	Number of respondents	% of Total Sample
Seed	9	81.81
Seedling	5	45.45
Vegetative cutting	3	27.27
Total number of respondents	= 17	100.00

(v) Functions/uses of trees	Number of respondents	% of Total Sample
Product	9	50.00
Service	3	16.67
Product and Service	6	33.33
Total	=17	100.00

(vi) Care given at early stage of growth	Number of respondents	% of Total Sample
Weeding only	3	16.67
Weeding and protection against livestock	5	27.78
Weeding and watering	1	5.56
Weeding, watering and protecting	4	22.22
Weeding, watering and fire protection	1	5.56
No care	4	22.2
Total number of respondents	= 18	

3.4 TENANCY AND SECURITY OF ACQUISITION OF PLOT

Plot acquisition in this gap does not attract any strict tenancy agreement. Respondents (19.2%) who even claimed they have some agreement for the use of the plots could not remember the last time they contacted their land owners. This claim seems to be an exaggeration due to the activity of the Arab Contractors in the area.

Table 3.12a depicts the report on land ownership in the study area. Fifty per cent of respondents generalize ownership as government land and 42.3% claim their portion belongs to the Railway Corporation. While 3.9% of respondents said the plot being used belongs to Volta river Authority (VRA), another 3.9% stated that the land in use is on the premises of the Ministry of Food and Agriculture.

Generally acquisition of holding is reported to be secure. All of the respondents stated their full security of the portion they are using unless the government comes out with new development plans for the land other than agriculture (Table 3.12b). They however were of the opinion that the pylons from VRA Substation Main A, the railway tracks of the Railway Corporation and the river Subin, are characteristics features of the area that would not allow housing development in the future.

Table 3.12a: Land Ownership in the Study Area (Subin/Asokwa Gap)

Owner	Number of respondents	% of Total Sample
Government	13	50.00
Railway Corporation	11	42.30
Volta River Authority	1	3.85
Ministry of Food and Agriculture	1	3.85
Total	26	100.00

Table 3.12b: Security of land acquired in the Subin/Asokwa Gap

Land security	Number of respondents	% of Total Sample
Well secured	26	100.00
Not secured	0	0.0
Total	26	100.00

3.5 HUSBANDRY PRACTICES

3.5.1 Inputs Used and Crop Protection Measures

Greater proportion of respondents (57.7% do not use any inputs for crop production. However, 15.4% of respondents apply fertilizer on their crops while 26.9% utilize both fertilizer and manure for crop production (Table 3.13 (i)).

Table 3.13 (ii) illustrates the crop protection measures adopted by respondents. Majority (76.9%) of respondents reported that clean clear weeding of plots is enough to keep their crops out of disease/pest damage. About 15.4% make use of chemical pesticides while 3.9% of respondents use neem (Azadirachta indica) leaf and again 3.9% use wood ash on their crops as crop protection measure against diseases/pests.

Table 3.13: Input used and crop protection measures in the Subin/Asokwa Gap (i)

Inputs Used

Response	Number of respondents	% of Total Sample
No inputs	15	57.69
Only fertilizer	4	15.39
Fertilizer + manure	7	26.92
Total	26	100.00

(ii) Protection Measures

Response	Number of respondents	% of Total Sample
Clean weeding	20	76.92
Chemical pest control	4	15.38
Neem leaf concoction	1	3.85
Wood ash	1	3.85
Total	26	100.00

3.5.2 Cost of Labour and Use of Crop Residues/By-products

A great proportion (65.4%) of respondents use paid labour for production (Table 3.14a). The cost of labour range from less than ¢4,000 to over 0150,000 per annum (Table 3.14b). A total cost of less than ¢50,000 per annum is used on labour by 64.7% of respondents and the rest 35.3% pay between ¢57,000 and ¢200,000 per annum to hired labour.

Handling of crop residues by respondents is shown in Table 13.4c. While 76.9% of respondents leave crop residuesiby products on their plots to rot/decay as a soil improvement measure, 15.4% burn the residues after harvesting. About 7.7% of respondents have a dual purpose for the residues; they use it to feed animals (rabbits and small ruminants) and leave the rest to rot on the plots in order to improve the soil fertility.

Table 3.14a: Use of paid labour by respondents in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Yes	17	65.38
No	9	34.62
Total	26	100.00

Table 3.14b: Cost of labour to respondents in the Subin/Asokwa Gap

Amount (p. a)	Number of respondents	% of Total Sample
Less or equal to ¢50,000	11	64.71
¢51,000 - ¢200,000	6	35.29
Total	17	100.00

Table 3.14c: Disposal of crop residues by respondents in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Left on farm	20	76.92
Burnt	4	15.39
Animal feed & left on farm	2	7.69
Total	26	100.00

3.6 ADVICE ON PERFORMANCE ON FARMING ACTIVITY

Sixty-nine per cent out of the total respondents receive no advice but 31 % get some sort of advice on production. Within respondents that are advised, 15.4% take advice from relatives, friends and spouses. Extension Agents from the Ministry of Food and Agriculture (MOFA) advise 37.5% of respondents while 25.0% receive advice from Ghana Organic Agriculture Network (GOAN). See table 3.15.

Table 3.15: Advice on Production in the Subin/Asokwa Gap

Response		Number of respondents	% of Total Sample
No advice		18	69.23
Advice from relatives, friends, etc.		4	15.38
Advice from MOFA		3	11.54
Advice from GOAN		2	7.69
Total Number of Respondents	=	26	

3.7 **MARKETING**

3.7.1 Disposal of Crop Produce

Crops grown solely for home consumption is by 15.4% respondents, although a considerable proportion of respondents (76.9%) sell their surpluses in the market,

leaving 7.7% of respondents going wholly commercial. No processing however, takes place for produce meant for the market which are sold at the farm gate (Table 3.16a).

Table 3.16b depicts produce mainly sold in the market. The sale of oil palm, sugar-cane and taro yield some amount of income to the respondents. Figures obtained were oil palm (18.2% of respondents), sugar cane (18.2%) and taro (18.2%). About 13.6% of respondents sell cocoyam/kontomire for income while 9.1% respectively earn income from the sale of cabbage, cassava, garden egg, maize, okro, banana/plantain and spring onions. However, carrots, cucumber, green pepper and lettuce each yield income for 4.6% of respondents.

Table 3.16a: Disposal of crop produce by respondents in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Home consumption and sold in the market	20	76.92
Home consumption only	4	15.39
Sold in the market	2	7.69
Total	26	100.00

3.2.7 Crop Consumption by the Farming Family

Common crop consumed in the study area include maize, cassava, banana/plantain and cocoyam/kontomire as indicated by 46.2%, 38.5%, 34.6% and 19.2% of respondents respectively. Other crops used by respondents in the preparation and consumed as food are pepper (11.15%), cabbage (7.7%), garden eggs (7.7%), oil palm (7.7%, okro (7.7%), taro (7.7%), cowpea (3.9%), ayoyo (3.9%), alefi (3.9%), lettuce (3.9%), tomato (3.9%), yam (3.9%) as well as sugar-cane 3.9% and fruits of pawpaw (3.9%) as clearly shown in Table 3.17a.

Out of the total sample, 15.4% consume the entire crop produce at home whereas similar proportion (15.4%) of respondents consume 1/10, 3/10 and 5110 of the total produce respectively (Table 3.17b). Nine-tenth of the total produce is taken at home by 11.5% households, where $2/10^{th}$ and 7/10 is eaten by 7.7% households respectively as well as 3.9% of respondents consuming $4/10^{th}$, $6/10^{th}$ and $8/10^{th}$ of the total crop produce at home.

Table 3.16b Produce mainly sold in the market by respondents in the Subin/Asokwa Gap

Scientific Name	Common Name	Number of respondents	% of Total Sample
Elaeis guineensis	Oil palm	4	18.18
Saccharum officanarum	Sugar-cane	4	18.18
Colocasia esculents	Water cocoyam (taro)	4	18.18
Xanthosoma sagittifolium	Cocoyam/lcontomir	3	13.64
Brassica capitata	Cabbage	2	9.09
Manihot esculentum	Cassava	2	9.09
Solanum sp.	Garden egg	2	9.09
Zea mays	Maize	2	9.09
	Okro	2	9.09
Musa spp.	Banana/plantain	2	9.09
	Spring onion	2	9.09
	Carrot	1	4.55
	Cucumber	1	4.55
Capsicum sp.	Green pepper	1	4.55
	Lettuce	1	4.55
Total Number of Respondents		=22	

3.8 ENTRY AND PROFITABILITY OF ACTIVITY

3.8.1 How Respondents Entered into the Activity

Table 3.18 shows how respondents enter into farming in the study area. About 46.2% of interviewees enter into the activity as a hobby. While 23.1 % took over from friends, relatives, parents, etc., 15.4% of respondents were advised to farm in order to make a living. Some respondents (7.7%) got into the activity by utilizing the available land at the premises, 7.7% initially started farming to prevent snakes encroaching on their estate. Clearing the area led to farming in the long run.

Table 3.17a: Crops mainly consumed by respondents in the Subin/Asokwa Gap

Scientific Name	Common Name	Number of respondents	% of Total Sample
Zea mays	Maize	12	46.15
Manihot esculentum	Cassava	10	38.46
Musa spp.	Banana/plantain	9	34.62
Xanthosoma	Cocoyam/kontomire	5	19.23
sagittifolium	Pepper	3	11.54
	Cabbage	2	7.69
Brassica capitata	Garden egg	2	7.69
Solanum sp.	Pawpaw	2	7.69
Carica papaya	Oil palm	2	7.69
Elaeis guineensis	Okro	2	7.69
	Water cocoyam (taro)	2	7.69
Colocasia esculenta	Amaranthus leaf (alefi)	1	3.85
Amaranthus sp.	Cowpea	1	3.85
Vigna unguiculata	Jute leaf (ayoyo)	1	3.85
	Lettuce	1	3.85
	Sugar cane	1	3.85
Saccharum off cinarum	Tomato	1	3.85
	Yam	1	3.85
Dioscorea alata			

Total Number of Respondents = 26

Approximately 42.3% out of the total sample stated over ¢200,000 as the amount used to enter the activity (Table 3.19a). About 38.5% indicated ¢51,000 - ¢200,000 as the initial cost of their enterprise while 7.7% spent up to about ¢50,000 to start the activity. However, 11.5% of respondents cannot remember nor guess the amount used to initiate the enterprise.

All respondents interviewed expressed the desire to advice any unemployed and/or even employed person to go into the activity since they earn their livelihood by doing so. The activity either helps them spend less income on food or yield some income or both. This proves that the activity in the gap is profitable.

Table 3.19a: Need for training in the Subin/Asokwa Gap

Response Sample	Number of respondents	% of Total
Yes	13	50.00
No	13	50.00
Total	26	100.00

Table 3.19b: Duration of training new entrants into farming in the Subin/Asokwa Gap

Period	Number of respondents	% of Total Sample
Less than 1 month	4	33.33
1 - 6 months	5	41.67
7 months - 1 year	1	8.33
1.5 - 5 years	0	0.00
Over 5 years	2	16.67
Total	12	100.00

Table 3.19c: Initial capital needed for farming in the Subin/Asokwa Gap

Amount	Number of respondents	% of Total Sample
Less or equal to ¢50,000	2	7.69
¢51,000 - ¢200,000	10	38.46
Over ¢200,000	11	42.31
No response	3	11.54
Total	26	100.00

3.9 CONSTRAINTS TO PRODUCTION AND CHANGES IN ACTIVITY

3.9.1 Constraints Facing Farmers

Constraints associated with production and crop growth, development and yield (Table 3.20a) were expressed by 88.5% of respondents. Sixty-nine per cent of production constraints are due to the activity being carried out in Kumasi Metropolis. Among these, theft of crops ranks high (30.4%), followed by destruction of farms due to ongoing constructional work (21.7%) while 4.4% of respondents respectively reported scarcity of labour and crop damage by roaming livestock (Table 3.20b).

As high as 43.5% of respondents reported that financial constraints are affecting their production. Other constraints which include floods following heavy rains during the rainy season (21.7%) which results in waterlogging during the dry season; poor soil fertility (17.4%); and diseases/pest damage (8.7%) seriously affect growth, development and yield in the study area (Table 3.20b).

Table 3.20a: Constraints in the study area (Subin/Asokwa Gap)

Response	Number of respondents	% of Total Sample
Yes	23	88.46
No	3	11.54
Total	26	100.00

Table 3.20b: Main constraints associated with production in the Subin/Asokwa Gap

Type of Constraints	Number of respondents	% of Total Sample
Insufficient fund	10	43.48
Theft of produce	7	30.43
Flood hazards	5	21.74
Constructional destruction	5	21.74
Poor soil fertility	4	17.39
Disease/pest damage	2	8.70
Labour shortage	1	4.35
Livestock damage	1	4.35
Total number of respondents = 23		

3.9.2 Improving Production

From Table 3.21, almost 35% of respondents reported that availability and adequate supply of inputs (fertilizer, manure, etc) would improve production whereas 30.8% of interviewees claimed availability of more financial resources could help improve production. Approximately 15.4% of respondents mentioned educational programmes, especially on production in general, would improve production, while 11.5% stated availability and regular supply of labour. Some respondents (7.7%) are of the view that improving fertility of the land would subsequently improve production in the study area. In addition, 3.9% suggested that making more land available is enough for production to improve. Finally 3.9% proposed that invention of new weed control measures could help improve production.

Table 3.21: Suggestions on how to improve production in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Availability and adequate supply of inputs	9	34.62
Availability of financial resources	8	30.77
Increased educational programmes	4	15.38
Availability and regular supply of labour	3	11.54
Improved fertility of farm/plot	2	7.69
Availability of land	1	3.85
Weed control measures	1	3.85
Total number of respondents =	26	100.00

3.9.3 Changes in Production and Marketing

Table 3.22a illustrates changes in production within the last 15 years. While 42.3% of respondents reported increases, 7.7% declared decrease in production. As much as 23.1% of interviewees indicated no change and another 23.1% expressed ignorance of changes in production, whereas 3.9% of respondents claimed that the study area is no more swampy as before.

Out of those respondents that dispose of their produce for some income, 23.1% recognised an improvement in marketing whereas 3.9% indicated a decrease. When 19.2% of respondents claimed no appreciable change in marketing, 53.9% could not tell whether there is improvement in marketing or not because they strictly produce on subsistence consumption (Table 3.22b).

Table 3.22a: Changes in production within the last 15 years in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Increased production	11	42.30
Decreased production	2	7.69
No change in production	6	23.08
Ignorant of change in production	6	23.08
Land no longer swampy	1	3.85
Total	26	100.00

Table 3.22b: Changes in marketing produce within the last 15 years in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Improved marketing	6	23.08
Low prices for produce	1	3.85
No change in marketing	5	19.22
Ignorant of change in marketing	14	53.85
Total	26	100.00

3.9.4 Changes in the Number of Enterprises

There is an appreciable increase in the number of enterprises in the gap (Table 3.23a) as reported by 92% of respondents as opposed by 8% who claimed there is a decrease. Table 3.23b) indicated the various reasons assigned to the changes in the number of enterprises. Expansion in the enterprises is attributed to:

(i) the activity being lucrative and source of household food (66.7% of respondents);

(ii) activity leading to reduction in market expenditure on food (16.7%);

(iii) increasing household sizes of respondents or population explosion (4.2%) and

(iv) availability of ready market for produce in recent times (4.2%).

However, 83% of respondents indicated that the constructional work by the Arab Contractors in the Subin river has resulted in people abandoning their farms leading to reduction in the number of enterprises/farms.

Table 3.23a: Changes in number of enterprise in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Increasing	23	92.00
Decreasing	3	8.00
Total	26	100.00

Table 3.23b: Reason(s) for expansion/reduction in enterprises in the Subin/Asokwa Gap

Reason	Number of respondents	% of Total Sample
Lucrative and source of household food	16	66.67
Reduction in market expenditure on food	4	16.67
Ready market for produce	1	4.17
Increasing household size	1	4.17
Constructional destruction of farm	2	8.32
Total	24	100.00

3.9 5 Future Changes and Playas

Expected future changes in the Subin/Asokwa gap is illustrated in Table 3.24. Forty two per cent expressed an increased activity in the gap whereas 23.1% anticipated land scarcity and land disputes in the future. Nearly 15.4% of respondents believe that more and new crop varieties that are suitable and adaptable would be introduced into the area but 11.5% have the feeling that the soil would lose its fertility rendering the land unsuitable for crops in the future and further 7.7% stated that the area may be used for other purposes especially estate development since it does not belong to them. However, 7.7% of respondents cannot predict any future change in the gap.

Respondents strongly stressed that initiation and devotion to education on production in the gap by resource personnel would go a long way to help them as individuals and the nation at large.

Table 3.24: Expected future changes in activity in the in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Increase in production	11	42.31
Land scarcity and dispute	6	23.08
Increase number of crop variety	4	15.38
Loss in soil fertility	3	11.54
Land used for other purposes	2	7.69
Cannot predict any change	2	7.69
Total number of respondents =	26	

4.0 NORTH SUNTRESO/RACE COURSE GAP CROP PRODUCTION

This is a representative gap of high density housing in the northwest of the Kumasi Metropolis/city. It is a large open area between North Suntreso and Odumasi Extension. A selected sample size of twelve (12) is used in describing the crop production characteristics for the area. Other respondents were not reached for interview due to the controversial nature of the study area as stated (1.3 vide supra page 3).

4.1 THE CULTIVATOR/GATHERER

Respondents in the study are all farming in the gap. They are also tenants farmers.

4.1.1 ***Sex and Age Distribution of Respondents in the North Suntreso Gap***

Respondents interviewed in the study area are all male. The age variation of respondents range from 24 - 58 years. From Table 4.1, 50.0% of respondents are middle-aged (31- 50 years), while 33.3% are just above the middle age class (51 - 70 years) and 16.7% are in their youthful age (less or equal to 30 years).

Table 4.1: Age distribution of respondents *in the North Suntreso Gap*

Age	**Number of respondents**	**% of Total Sample**
Less or equal to 30 years	2	16.67
31 - 50 years	6	50.00
51 - 70 years	4	33.33
Total	12	100.00

4.1.2 Household Size

The number of household members range from 3 - 15 with the average estimated to be 6.7. The average household size of 4 - 10 members, comprising the husband with wife(wives), their children, and other dependents. From Table 4.2, 41.7% of respondents have 5 - 7 persons per household. One-third of total respondents (33.3%) are of large household size (8 or more persons) and 25% are of small sizes (4 persons or less).

Table 4.2: Household size of respondents in the North Suntreso Gap

Number of persons	Number of respondents	% of Total Sample
Small (less or equal to 4 persons)	3	25.00
Medium (5 - 7 persons)	5	41.67
Large (more or equal to 8 persons)	4	33.33
Total	12	100.00

Household range: 3 -15 persons
Average household size: 6.7 $\pm$ 3.3 persons

4.1.3 Educational Background of Respondents

Table 4.3 shows the educational status of respondents. Out of the total sample, nearly half (50.0%) have received no formal education and are illiterates. While 33.3% had primary education, the rest 16.7% have had some secondary education.

Table 4.3: Educational Background of Respondents in the North Suntreso Gap

Level	Number of respondents	% of Total Sample
Secondary education	2	16.67
Primary education	4	33.33
No formal education	6	50.00
Total	12	100.00

4.1.4 Occupational Distribution

Majority of respondents (75%) are employed in the private sector or self-employed (Table 4.4). This includes 33.3% Artisans (carpenter, mechanics, mason, shoemaker, etc.), 25% full-time farmers, 8.3% Drivers and 8.3% Porters. The rest are employed as Watchmen (16.7%) and Labourers (8.3%).

Table 4.4: Occupational distribution of respondents in the North Suntreso Gap

Type of occupation	Number of respondents	% of Total Sample
Artisan	4	33.34
Farmer	3	25.00
Watchman	2	16.67
Driver	1	8.33
Labourer	1	8.33
Porter	1	8.33
Total	12	100.00

4.1.5 Ethnic Origin of Respondents

Respondents migrated from the Guinea and Sudan Savannas of the north. A total of 91.7% respondents hail from Upper East Region and 8.3% are immigrants from neighbouring Burkina Faso (Table 4.5).

Table 4.5: Ethnic origin of respondents in the North Suntreso Gap

Region	Number of respondents	% of Total Sample
Upper East	11	91.67
Burkina Faso	1	8.33
Total	12	100.00

4.1.6 Years Resident in Kumasi and Dwelling Place of Respondents

Fifty-eight per cent of respondents have been in the Kumasi Metropolis for the past 1 1 - 30 years (Table 4.6a). A quarter of the total (25%) have been in Kumasi for an appreciably long periods (31 - 50 years) and 16.7% have stayed for a short periods (less or equal to 10 years) in the metropolis.

From Table 4.6b, majority (91.7% of respondents take a distance of less than one kilometers while 8.3% walk 1 - 4 km to reach their farms.

Table 4.6a: Duration of stay in Kumasi (North Suntreso Gap)

Level	Number of respondents	% of Total Sample
Short (lessor equal to 10 years)	2	16.67
Long (11 - 30 years)	7	58.33
Appreciably long 31 - 50 years)	3	25.00
Total	12	100.00

Table 4.7b: Location of dwelling of respondents in the North Suntreso Gap

Distance	Number of respondents	% of Total Sample
Less than 1 km	11	91.67
1 - 4 k m	1	8.33
Total	12	100.00

4.2 CROPPING HISTORY AND PLACE IN LIVELIHOOD

4.2.1 Previous Cultivators and Crop Grown

Table 4.7a(i) depicts the knowledge of previous cultivators for which 58.3% of respondents are aware of such. About 41.7% of respondents could not tell outright whether their plots have ever been cultivated before.

For those who are aware, the knowledge of one previous cultivator is stated by 85.7% and that of two by 14.3% *Table 4.7a(ii).

A total of 71.4% of previous cultivators had planted maize and banana/plantain. Cassava had been planted by 42.9%; and sugar-cane by 28.6% of respondents. Vegetables such as cabbage, cucumber, green peas, green pepper, lettuce and tomato were respectively cultivated by 14.3% of previous cultivators (Table 4.7b).

Table 4.8a: Knowledge and number of previous cultivator in the North Suntreso Gap

(i) Knowledge of previous cultivators

Response	Number of respondents	% of Total Sample
Yes	7	58.33
No	5	41.67
Total	12	100.00

(ii) Number of previous cultivators per plot in North Suntreso Gap

Number of cultivators	Number of respondents	% of Total Sample
1	6	85.71
2	1	14.29
Total	7	100.00

Table 4.7b: Types of crops cultivated by previous cultivators in North Suntreso Gap

Scientific name	Common name	Number of respondents	% of Total Sample
Zea mays	Maize	5	71.43
Musa spp.	Banana/plantain	3	42.86:'
Manihot esculents	Cassava	3	42.86:
Saccharum off	Sugar cane	2	28.27'
Brassica capitata	Cabbage	1	14.29
Cucumis edulis	Cucumber	1	14.29:
	Green peas	1	14.29'
Capsicum sp.	Green pepper	1	14.29
Launaea saliva	Lettuce	1	14.29
Lycopersicum esculentum	Tomato	1	1419
Total number of respondents	=	7	

4.2.2 Types of f Crops and Cropping Pattern of Respondents

Parcels of land have been in use for 1 - 5 years by 58.3% respondents and 25% within 6 - 10 years. Nearly 8.3% of respondents had used their plots for less than a year,a similar proportion (8.3%) have utilised the land for over 20 years (Table 4.8a).

Crops cultivated by respondents are shown in Table 4.8b. Maize, banana/plantain and cassava rank paramount as they are cultivated by 91.7%, 83.3% and 66.7% respondents respectively. Cocoyam/kontomire is grown by 41.7% of the respondents. This same percentage of respondents also grow cowpea. The rest grow alefi (25%) of respondents), ayoyo (25%) and taro (25%).

Additional crops include groundnut (16.7% of respondents). This also applies to mango (16.7% of respondents), pepper (25%) kenaf (25%), sugar cane (25%) and tomato (25%). In response to the question on other crops cultivated 8.3% of respondents cultivated avocado pear, garden eggs, okro, sour sop and yam respectively.

Eighty-three per cent of respondents practice multiple cropping pattern with the above crops. About 17% grow these crops in a multiple crop pattern but on rotational basis. This is due to the fact that production is mainly on subsistence consumption (Table 4.8c).

Table 4.8a: Length of cultivation by present farmers/respondents in the North Suntreso Gap

Period	Number of respondents	% of Total Sample
Less than 1 year	1	8.33
1 - 5 years	7	58.34
6 - 1 0 years	3	25.00
21+ years	1	8.33
Total	12	100.00

Table 4.8b: Types of crops cultivated by respondents in the North Suntreso Gap

Scientific name	Common name	Number of respondents	% of Total Sample
Zea mais	Maize	11	91.67
Musa spp.	Banana/plantain	10	83.33
Manihot esculentum	Cassava	8	66.67
Xanthosoma	Cocoyam/kontomire	5	41.67
Vigna unguiculata	Cowpea	5	41.67
Amaranthus spp.	Amaranthus leaf (alefi)	3	25.00
	Jute leaf (ayoyo)	3	25.00
Colocasia esculenta	Water cocoyam	3	16.67
	Groundnut	2	16.67
Mangifera indica	Mango	2	16.67
Capsicum sp.	Pepper	2	16.67
	Kenaf (sure)	2	16.67
Saccharum ofcinarum	Sugar-cane	2	16.67
Lycopersicum	Tomato	2	16.67
	Avocado pear	1	8.33
Solanum sp.	Garden egg	1	8.33
Hibiscus sp.	Okro	1	8.33
	Sour sop	1	8.33
Dioscorea alata	Yam	1	8.33
Total number of respondents	=	12	

Table 4.8c: Cropping Pattern of Respondents in the North Suntreso Gap

Pattern	Number of respondents	% of Total Sample
Multiple	10	83.33
Multiple & rotational	2	16.67
Total	12	100.00

4.2.3 Areas of Plot Cultivated and Reason(s) for Farming

Table 4.9a illustrates the land holding of respondents which is relatively small. The range of holding is 0.25 - 4.0 acres with the average of 1.2 acres. A great proportion (45.5%) of respondents hold less than an acre and another 36.4% have 1 -

1.5 acres. Few respondents (9.1%) cultivated 2.0 - 2.5 acres and similar proportion (9.1) utilize as large as 4.0 - 4.5 acres.

The main reason given by respondents for going into farming is to reduce family expenditure on food. Half (50%) of the total respondents farm solely to supplement household meals while 16.7% farm to supplement family income. The activity provides employment and source of income for 16.7% and also yields food and income for another 16.7% of respondents (Table 4.9a).

Table 4.9a: Size of Plots/farms of Respondents in the North Suntreso Gap

Size	Number of respondents	% of Total Sample
Less than 1.0 acre	5	45.46
1.0 - 1.5 acres	4	36.36
2.0 - 2.5 acres	1	9.09
4.0 - 4.5 acres	1	9.09
Total	11	100.00

Range of holding: 0.25 - 4.0 acres; Average holding: 1 - 2 areas; 1.0 acre = 4ha.

Table 4.9b: Reasons cited for farming by respondents in the North Suntreso Gap

Reason	Number of respondents	% of Total Sample
Source of employment/income	2	16.67
Supplement family income	2	16.67
Source of family income & food	2	16.67
Supplement household meal	6	50.00
Total	12	100.01

4.2.4 Other Agricultural Activities Carried out by Respondents in the North Suntreso Gap

Fifty-eight per cent of respondents are engaged in other agricultural activities to supplement crop production (Table 4.10a). Out of these respondents (Table 4.10b), 57.1% keep backyard poultry, 28.6% have both backyard poultry and small ruminants (sheep and goats) and 14.3% rear only small ruminants.

Table 4.10a: Other Agricultural activities by **respondents in the North Suntreso Gap**

Response	Number of respondents	% of Total Sample
Yes	5	58.33
No	7	41.67
Total	12	100.00

Table 4.10b: Type of other agricultural activities of respondents in the North Suntreso Gap

Type	Number of respondents	% of Total Sample
Only poultry	4	57.14
Poultry and small ruminants	2	28.57
Only small ruminants	1	14.29
Total	7	100.00

4.3 Tree planting and management

Approximately 83.3% of respondents have trees on their plots (Table 4.11 {i}). Forty per cent of these trees were purposely planted (Table 4.11 {ii}). The source of planting materials include wildings (25%) and private nurseries (75%) as depicted in Table 4.11 {iii}. The most common type of planting material used in establishing the trees are seeds.

The functions of these trees are shown in Table 4.11 {iv). Fifty per cent of respondents with trees on their plots enjoy only the product (fruits) function. The trees provide product and service functions to 30% and only service function (shade/shelter belt) to 20% of respondents

Care given to these trees during early growth include weeding (50%); protection against livestock damage (30%); and watering (20%). This is illustrated in Table 4.11(v).

Table 4.11: Tree planting and management by respondents in the North Suntreso Gap

(i) Trees on farm	Number of respondents	% of Total Sample
Yes	10	83.33
No	2	16.67
Total	12	100.00

(ii) Trees intentionally grown	Number of respondents	% of Total Sample
Yes	4	40.00
No	6	60.00
Total	10	100.00

(iii) Source of planting material	Number of respondents	% of Total Sample
Private nursery	3	75.00
Wildings	1	25.00
Total	4	100.00

(iv) Functions of trees	Number of respondents	% of Total Sample
Only products	5	50.00
Product & service	3	30.00
Only service	2	20.00
Total	10	100.00

(v) Care given at early stage of growth	Number of respondents	% of Total Sample
Weeding	5	50.00
Protection from livestock damage	3	30.00
Watering	2	20.00
Total	10	100.00

4.4 Tenancy and security of tenure

Tenancy agreement is an unknown principle in the study area. They assume keeping weeds under check while performing their activities (Table 4.12a) gives them the right to work on the land. About 41.7% declared that the parcel of land belongs to

a private or corporate body and 25% stated that it is stool land (Asantehene). Some- respondents (16.7%) are of the view that the pieces of land, belongs to the government, others (8.3%) simply said it belongs to KMA. However, another 8.3%- could not assign any ownership tag to their plots.

When asked whether respondents are secured (Table 4.12b) on the land, 75% responded in the affirmative. They claimed unless there is a specific use for the land, as it is happening, it will be under their cultivation. Twenty-five per cent however, are indifferent to their security of tenure.

4.5 Husbandry practices

4.5.1 Inputs Used and Crop Protection Measures

Fifty per cent of respondents do not use inputs in production (Table 4.13 {i}) but 25.0% make use of manure for production. Crop protection measures used by respondents are shown in Table 4.13 {ii}. In all, 75.0% of respondents stick to clear weeding to prevent any pest/disease damage. Twenty-five per cent use wood ash to protect their crops and 16.7% one way or the other practice chemical control method.

Table 4.12a: Land ownership in the North Suntreso Gap

Land owner	Number of respondents	% of Total Sample
Private individual	5	41.67
Stool (Asantehene)	3	25.00
Government	2	16.67
Kumasi Metropolitan Assembly	1	8.33
Do not know	1	8.33
Total	12	100.00

Table 4.12b: Land Security in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
Well secured	9	75.00
Not secured	3	25.00
Total	12	100.00

Table 4.13: Inputs used on crop and crop protection measures in the North Suntreso Gap

(i) Inputs	Number of respondents	% of Total Sample
No input	6	50.00
Only fertilizer	3	25.00
Only manure	3	25.00
Total	12	100.00

(ii) Crop protection measures	Number of respondents	% of Total Sample
Clean weeding	9	75.00
Wood ash	3	25.00
Chemical protection	2	16.67
Total	12	

4.5.2 Cost of Labour and Use of Crop Residues/Byproducts

Almost 58.3% of respondents use paid labour with the wage range of ¢20,000.00 - ¢112,000.00 per annum. From Table 4.14a, while 57.1% of this proportion spend ¢51,000.00 - ¢200,000.00, the rest 42.9% use up to ¢50,000.00 on labour per annum.

Approximately 81,8% leave crop residues on their plots to decay/rot as a measure for soil improvement. Nine per cent use the residues for animal feed but 9.0% burn residues after harvesting (Table 4.14b).

Table 4.14a: Use and cost of paid labour by the respondents in the North Suntreso Gap

(i) Use paid labour

Response	Number of respondents	% of Total Sample
Yes	5	58.33
No	7	41.67
Total	12	100.00

(ii) Cost of labour

Amount (per annum)	Number of respondents	% of Total Sample
Less or equal to 050,000.00	3	42.86
051,000 - 0200,000	4	57.14
Total	7	100.00

Table 4.14b: Disposal of residues/By-products

Response	Number of respondents	% of Total Sample
Left on farm	9	81.82
Animal feed	1	9.09
Burnt	1	9.09
Total	11	100.00

4.6 Advice on farming activity

A great proportion (91.7%) of respondents do not receive advice on farming activities. Only 8.3% receive their some advice on production, even though infrequent, from Agricultural Extension Agents (AEA) of the Ministry of food and Agriculture (Table 4.15).

Table 4.15: Advice on production in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
Yes	1	8.33
No	11	91.67
Total	12	100.00

4.7 Marketing

4.7.1 Disposal of Produce

From Table 4.16a, 50% of respondents produce mainly for home consumption, 8.3% mainly on commercial basis and 41.7% for home consumption and surpluses for the market. No processing is done to produce for the market sold at the farm gate.

Produce mostly sold in the market includes banana/plantain, sugar cane and tomato. This is by 33.3% of respondents respectively (Table 4.16b).

Table 4.16a: Disposal of produce by respondents in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
Mainly home consumption	6	50.00
Both home consumption and sold to the market	5	41.67
Mainly chemical	1	8.33
Total	12	100.00

Table 4.16b: Produce mainly sold in the market by respondents in the North Suntreso Gap

Scientific name	Common name	Number of respondents	% of Total Sample
Musa spp.	Banana/plantain	2	33.33
Saccharum officinarum	Sugar-cane	2	33.33
Lycopersicum esculentum	Tomato	2	33.33
Total number of respondents		= 6	

4.72 Crop Consumption by Farming Family

Households use two or more crops in the preparation of meals. Table 4.17a shows the preference of consumption by the farming family. Every household (100%) in the gap use maize, followed by cassava (58.3%) in food preparation. Cowpea and banana/plantain rank next with 33.3% respectively and

cocoyam/kontomire are consumed by 25.0% households. Other produce with minimal use in the home include groundnut (16.7%), pepper (16.7%); `alefi' (8.3%), `ayoyo' (8.3%), `sule' (8.3%) and taro (8.3%).

About 50% of respondents consume the whole of the total produce (10/10) from their plots. About 6/10 and 5110 of the total produce is consumed by 16.7%

respondents respectively. Also 8.3% of respondents take 3/10 and 1/10th respectively of the total produce in the home.

Table 4.17a: **Crop produce mainly consumed by respondents in the North Suntreso Gap**

Scientific name	Common name	Number of respondents	% of Total Sample
Zea mays	Maize	12	100.00
Manihot esculentum	Cassava	7	58.33
Musa spp.	Banana/plantain	4	33.33
Vigna unguiculata	Cowpea	4	33.33
Xanthosoma sagittifolium	Cocoyam/kontomire	3	25.00
	Groundnut	2	16.67
	Pepper	2	16.67
Amaranthus spp	Amaranthus leaf (alefi)	1	8.33
	Jute leaf (ayoyo)	1	8.33
	Kenaf leaf (sure)	1	8.33
Colocasia esculentus	Water cocoyam (taro)	1	8.33
Total number of respondents		= 12	

Table 4.17b: Amount of total crop produce consumed by respondents in the North Suntreso Gap

Proportion consumed	% of total produce	Number of respondents	% of Total Sample
$^{10}/_{10}$	100	6	50.00
$^{6}/_{10}$	60	2	16.67
$^{s}/_{10}$	50	2	16.67
$^{3}/_{10}$	30	1	8
$^{1}/_{10}$	10	1	8.33
Total number of respondents		= 12	

4.8 Entry and profitability

4.8.1 Respondents entry into the Activity

Table 4.18 illustrates how respondents entered activity. Eighty-three per cent actually have pleasure in farming so entered as a hobby. The rest 16.7% of respondents entered by taking over from friends, relatives, parents, etc. Respondents

(100%) indicated that they would advise anybody who wishes to enter the activity to do so because it is profitable.

4.8.2 Training and Capital requirements

About 41.7% of respondents expressed the need for training before entering into fanning (Table 4.19a). The period of training should range from one week to two years. From Table 4.19b, 40% of those who called for training, specified 1 - 6 month period of training. However, 20% respondents expressed a training period of less than a month; seven months to one year; and one and half to five years respectively to equip new entrants.

Initial capital variation of ¢20,000.00 to one million cedis was identified by respondents (Table 4.19). Amounts ranging from ¢51,000.00 - ¢200,000.00 was used by 50% of respondents to enter the activity. Twenty-five per cent of respondents stated the use of less than ¢50,000.00 and 16.7% reported the use of over ¢200,000.00 to initiate the activity in the gap. However, 8.3% of respondents could not give the cost of the resources used during that time.

Table 4.18: Entry of respondents of North Suntreso Gap into activity

Response	Number of respondents	% of Total Sample
Have pleasure in farming (hobby)	10	83.33
Took over from previous owner	2	16.67
Total	12	100.00

Table 4.19a: Need for Training into the Activity in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
No	5	41.67
Yes	7	58.33
Total	12	100.00

Table 4.19b: Duration of training for new entrants in the North Suntreso Gap

Period	Number of respondents	% of Total Sample
Less than 1 month	1	20.00
1 month - 6 months	2	40.00
7 months - 1 year	1	20.00
1.5 years - 5 years	1	20.00
Total	5	100.00

Table 4.19c: Initial capital needed for the activity in the North Suntreso Gap

Amount	Number of respondents	% of Total Sample
Less than or equal to ¢50,000	3	25.00
051,000 - 0200,000	6	50.00
More than ¢200,000	2	16.67
No response	1	8.33
Total	12	100.00

4.9 Constraints to production and marketing

4.9.1 Constraints Facing Farmers

Seventy-five per cent of respondents identified certain problems and constraints associated with production, crop growth, development and yield (Table 4.20a). These include theft of crop produce; browsing of stray livestock; and destruction of farms by the KMA these were mentioned by 55.6%, 33.3% and 22.2% of respondents respectively. The KMA carried out the destruction of farms in order to resettle the traders and vehicles using Kejetia market and lorry park. Other constraints to production include lack of inputs and insufficient funds as respectively indicated by 44.4% and 11.1 % respondents (Table 4.20b).

4.9.2 Improving Production

Majority of respondents (75%) were of the opinion that making more financial resources available to them would improve production. Others (25%) are of the view that adequate and timely supply of inputs (fertilizer, manure, etc) would be ideal to

improve production. However, neither the residents nor the KMA have complained about the activity in the area (Table 4.21).

Table 4.20a: Constraints in the North Suntreso Gap

Response Sample	Number of respondents	% of Total
Yes	9	75.00
No	3	25.00
Total	12	100.00

Table 4.20b: Main problems and constraints associated with production in the North Suntreso Gap

Type of constraint	Number of respondents	% of Total Sample
Theft of produce	5	55.56
Lack of inputs	4	44.44
Livestock damage on crops	3	33.33
KMA destruction	2	22.22
Insufficient funds	1	11.11
Total number of respondents	= 9	

Table 4.21: Suggestions on how to improve production in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
Availability of more financial resources	9	75.00
Adequate and timely supply of inputs	3	25.00
Total	12	100.00

4.9.3 Changes in Production and Marketing

Almost 58.3% of respondents have not experienced any change in production in terms of growth and yield. However, 8.3% of respondents declared an increase in production while 33.3% indicated a decrease over the past 15 years (Table 4.22a)

The changes in marketing is depicted in Table 4.22b. Majority of respondents (75%) have not recognised an observable change in marketing over the past 15 years.

On the other hand, 25% of respondents claimed that market avenues have been improved within the past 15 years.

Table 4.22a: Changes in production within the past 15 years in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
No change	7	58.34
Increase in production	1	8.33
Decrease in production	4	33.33
Total	12	100.00

Table 4.22b: Changes in marketing within the past 15 years in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
No change	6	75.00
Improved market avenues	2	25.00
Total	8	100.00

4.9.4 Changes in Number of Enterprises

From Table 4.23a, 66.7% of respondents believe that the number of enterprises are decreasing. However, 25% reported an expansion in the number of the enterprise within the past 15 years. Surprisingly, 8.3% are ignorant about a change in the number of enterprises.

The reasons for change in the number of enterprises is shown in Table 4.23b. About 9.1% respondents stated that due to the high cost of living, more people are trying to minimize expenditure on food and hence go into farming. Another 9.1 % emphasized the lucrative nature of the activity and therefore attracting a lot of unemployed persons into the area to farm. Further 9.1% attributed the expansion of the enterprises to the good nature of the soil in the study area. Reduction in enterprises are however blamed on the destruction of farms (72.7% of respondents) due to resettlement of the

Kejetia market and lorry park. This has discouraged people and therefore they have stopped farming in the gap.

Table 4.23a: Change in number of enterprises in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
Increasing	3	25.00
Decreasing	8	66.67
Ignorant	1	8.33
Total	12	100.00

Table 4.23b: Reasons for the change in the number of enterprise in the North Suntreso Gap

Reasons	Number of respondents	% of Total Sample
Minimizing expenditure on food	1	9.09
Lucrative and source of employment	1	9.09
Good soil fertility	1	9.09
Stop farming due to market i.e. settlement	8	72.73
Total	11	100.00

4.9.5 Future Changes and Plans

From Table 4.24, about 66.7% of respondents anticipate a decline in farming in the future. This is elaborated as follows:

- the successful resettlement of the Kejetia market and lorry park with its expansion is pernicious to the activity and is expressed by 41.7% respondents;
- 8.3% of respondents think the revamping of the Race Course will drastically reduce the activity in the gap;
- another 8.3% respondents feel that if the land owners decide to take over in the future, then they will have to vacate the land;
- further 8.3% seriously think some may abandon the activity if they get better paid jobs in the future.

However, 16.7% strongly believe that a lot of people will revert to farming if the resettlement failed. Another 16.7% also cannot predict what will happen in the future.

The future plan of respondents is to expand cultivation in the gap if certain conditions are met. These are:

- the KMA should decide on the projects it wants to undertake in the area and stop the `on and off' destruction of farms

- the KMA should help with measures that would reduce the theft of their crops by executing stringent action against the illegal person(s) in the area (as stated in 1.3 page 3); and
- the government should educate and open avenues so that they can access financial resources.

Table 4.24: Expected future changes in farming in the North Suntreso Gap

Response	Number of respondents	% of Total Sample
Resettlement of market stops activity	5	41.67
Revamping of Race Course stops activity	1	8.33
Land owners may take over land	1	8.33
Abandon farming for better job	1	8.33
Revert to activity if market fail	2	16.67
Cannot predict	2	16.67
Total	12	100.00

5.0 SUMMARY AND RECOMMENDATIONS

This chapter tries to point at the general crop production activity in the Kumasi Metropolis/City. It comprises small to large open areas; low to high density housing; and industrial to residential areas. These gaps stretch from the north-west to south-east of the city.
The total selected sample as indicated in Table 1, is 59. Based on the summary of the data collected in Appendix 1, the Kumasi Urban Gap Crop Production characteristics are described.

5.1 THE CULTIVATOR

The overall per cent sex ratio of male to female in the study is 83 to 17. Ages of farmers range between 24 and 94 years with 51% in the middle age class (31-50 years) and 27% within 51-70 years. Only 15% are in the youthful age (< 30 years) and 7% however, are above 70 years of age.

Cropping is by 33% full-time farmers. The others' main work or occupation is listed below: Labourer (27%); Artisan (14%); Prison Officer (10%); Petty trader (9%); Watchman (7%); Bank clerk (2%); Caterer (2%); Driver (2%); Priest (2%); Police Officer (2%); Porter (2%) and Secretary (2%).

Surprisingly, only 25% respondents cater for small household sizes (< 4 persons). While 37% respondents have medium household size (5 - 7 persons), similar proportion (37%) care for large household size (8+ persons) in the study area.

Majority of respondents (68%) had some sort of formal education. This comprises 5% Tertiary, 20% Secondary/Technical, 31% Middle/JSS and 12% Primary education. However, 32% had no formal education and are illiterates.

Respondents are predominantly (46%) of Upper East origin with 3% from Upper West region. Only 19% hail from Ashanti, and 10% Volta, Another 10% are citizens from Central, 3% respondents come from Greater Accra, fin-ther 3% from Brong Ahafo and 2% from Eastern regions. A total of 3% are immigrants from neighbouring Burkina Faso.

These urban-gap farmers have been in Kumasi from 15 to 70 years. Thirty two per cent respondents resided in Kumasi for at most the past 10 years. Thirty four per cent respondents also stayed in the city within the past 11-30 years. Thirty one per cent have been in Kumasi for the past 31-50 years and only 3% had lived in the metropolis quite above 50 years.

5.2 CROPS AND PLACE IN LIVELIHOOD SYSTEM

Crops of interest include banana/plantain (83%), cassava (64%), maize (54%), taro (41%), cocoyam/kontomire (34%), sugar cane (34%), cowpea (15%), yam (9%) and groundnut (3%).

Vegetables cultivated include garden egg (20%), `ayoyo' (19%), `alefi' (15%), okro (15%), pepper (12%), cabbage (1.0%), tomato (9%), lettuce (5%), carrot (3%), cucumber (3 %), green p epp or (3 %) and ` sure' (3 %).

Trees and tree-like fruits cultivated are oil palm. (29%), mango (10%), pawpaw (9%), sur sop (3%), avocado pear (3%), coconut (3%) and orange (2%).

Cultivation is generally on subsistence consumption. In cognisance with the ethnic origin of the cultivators, these crops listed above depict staple crops. The pattern of cropping is generally pure multiple or mixed cropping (83%). Vegetable commercially grown are wholly monocropped (9%). However, 7% respondents though do mixed cropping occasionally do so on rotational basis, whereas 2% do similar to their monocrops..

-Land holding is relatively small, ranging from 0.1 - 6.0 acres. About 28% respondents hold land less than 1.0 acres, 31% use plot size between 1.0 and 1.5 acres, and 16% have plots within 2.0 - 2.5 acres. While 5% respondents cultivate about 3.0 - 3.5 acres, 12% do so to comparatively large plots of 4.0 - 4.5 acres, and 9% of respondents actually hold land as large as 5.0 acres and above.

no small parcels of land are under cultivation for less than one year (7%); for 1.0 - *S'* years (44%); for 6.0 - 10 year (20%). Nearly 10% respondents are cultivating their plots for 11 - 15 year; 7% for 16 - 20 years and 12% use the land for over 20 years.

The number of mouths to feed and clothe *(average* household size of 6.5 persons) coupled with the rising economic hardship compelled most respondents to farm. However, individual expression as the reasons(s) for holding onto these plots include:

- cultivation is a source of employment and income (39%);
- the produce from these plots serve as a source of family income and food (49%);
- the sale of produce supplements family income (3%);
- produce supplement household meal (41%);
- produce from these plots improves household food security (3%).

Few respondents (36%) undertake additional agricultural activities (in or outside the gap) for the upkeep of the family. Out of this total, 31% keep backyard poultry; 10% rear only small ruminants; 14% practice fishery; another 14% rear snails and 5% have backyard piggery.

5.3 TENANCY AND SECURITY OF LAND ACQUISITION

Land under cultivation according to respondents belongs to the Government (34%), the Railway Corporation (19%), Prison Service (14%), State Housing Corporation (10%), Volta River Authority (2%), Ministry of Food and Agriculture (2%), Kumasi Metropolitan Assembly (2%), Private individual 12% and Stool land 5%. However, 2% respondents cannot tell the owners of their plots.

Though there is no specific landowner-farmer tenure agreement, farming in these urban gap is secured as said by 92% of respondents. Farmers on the other hand, as

giving reasons for their security, claim they are doing the landowners a favour by regularly keeping weeds under check. This the land owners could have spend a lot of the money doing. However, only new developments in the area, expressed by respondents, can deprive them of these plots of land.

5.4 HUSBANDRY PRACTICES

Sixty one per cent respondents use no inputs on their crops. Nearly 19% use fertiliser/pesticide; while 7% use only manure, 14% use both fertiliser and manure. The inputs are obtained from dealers in the open market. However, manure is obtained from the backyard poultry or commercial poultry farms.

The conventional chemical crop protection is practised by 12% respondents and these are mostly the commercial vegetable farmers. While 7% respondents use wood ash, 2% use Neem (Azadiracta indica) leaves concoction and 5% fence round their plots for crop protection. Generally, farmers (78%) clean clear weed their farms in order to get ride of any pest/disease organisms

About 53% respondents use paid labour. Out of this proportion, 52% play less or equal to ¢50,000.00 per annum labour, while only 7% from ¢51,000.00 - ¢200,000.00 per annum for labour.

Twelve per cent of total respondents burn up crop residues/by-products after harvesting. Nearly 83% respondents leave the residues to decay for soil amendment, while 3% feed animals with the residues and leave the rest to decay on the field, 2% solely feed animals with the residues.

A great proportion (76%) respondents receive no advice on the activity. The rest (24%) occasionally receive advice from relatives, friends, etc (14%), experts from MOFA (9%) and GOAN (3%) on production.

5.5 TREE PLANTING AND MANAGEMENT

The majority of respondents (73%) have trees in their farms. A maximum of 58% respondents intentionally grow these trees. The source of planting materials are from the private nursery (84%), open market (4%) and wildings (12%). The remaining 42% respondents who did not intentionally plant trees on their farms also had them already growing wild.

Type of planting materials used by these tree grower include seeds (80%), seedlings (28%) and vegetative cutting (24%). Some care was given to these materials till they are matured and these include: only weeding round the seedlings (35%); weeding and protecting seedlings against livestock damage (121/o); only protecting seedlings against livestock damage (19%); weeding round and watering the seedlings (7%); weeding, watering and protection seedlings against livestock damage (9%); weeding, watering and protecting seedlings against fire (2%); and only watering of seedlings. However, 12% respondents gave no special care to the seedlings during their early growth.

The functions/uses of these trees to respondents are only product (fruits, leaves for fodder, wood, etc.) function to 49% respondents; only service (shade, shelter belt, windbreak, boundary demarcation, etc.) to 21% respondents; and both product and service functions to 37°/~;

5.6 MARKETING

A great proportion (61%) of respondents produce on subsistence basis but sell their surplus to the market. 34% produce solely for home consumption with only 5% mainly commercial production.

Crops mainly sold include: sugar cane (33%), bananalplantain (15□/Q), taro (15%), cassava (10%), palm fruit (10□/❑), ocoyamlkontomire (8%), and maize (5%). Vegetables such as garden egg (8%) tomato (5□%a), cabbage (5%), okro (5%), spring onion (5□/0), `alefi' (3%), `ayoyo' (3%), carrot (3%), cucumber (3□/0), lettuce (3%) **and,** peen pepper (3%) are also sold.

All produce sold are not processed before sale as they are sold at the farm gate. Majority of the farming families consume maize (50%), bananalplantain (44%) and cassava (42%). Other crops consume include cocoyamlkontomire (17%), taro (15%, Wwpea (9%), palm fruits (7%), groundnut (3□/0), sugar cane (3%) and yam (2□/0). Vegetables eaten alongside the above crops include pepper (10%), `alefi' (7%), `ayoyo' (7□/❑), garden egg (5□/0), okro (3□/❑), cabbage (3□/0), lettuce (2%), tomato (2%), `sure' (2%). Fruits crops normally used as desert are pawpaw (3□/❑) and mango (2%).

The farming families consume the above listed crops in the following proportions: All (-/10) produce from the farm (34%); 9110- of the total produce (5□/❑); 8110th of produced by 5% households; 7110- by 7% families; and 6110- by 5%. Half (5110) of the total produce is consumed by 10% household; 4110 by 3%; 3110 by 10%; 2110r by 9% and 1110th by 12% households respectively,,

5.7 ENTRY AND PROFITABILITY OF A CTIVITY

Almost 51% respondents enter into the activity as a hobby. 20% respondents took over from previous owners who abandoned their plots either through death or transfer from the Kumasi city. 14% respondents were advised into the activity by either parents, relatives or friends. 10% respondents took advantage of the open idle land at their premises. 2% respondents provisionally cleared their area in order to prevent refuse dumping at such premises and hence entered into the activity. 3□/n respondents also cleared area under cultivation initially to prevent snake encroachment onto their premises.

Most (54%) respondent do not see the need for training into the activity. However, 46% respondents propose training for activity. This varies from less than a month's training 39% out of the 46%; 1 - 6 months' training (35%); 7 months - 1.0 year (8%); *1.5* - 5.0 years (8%) and more than 5.0 years training (12%).

A wide range of capital (¢200,000.00 - ¢1,000,000.00) was used to establish farms in the gap. 35% respondents used an amount less or equal to ¢50,000.00 tostart their

farms. 38% also used between ¢51,000,000.00 - 0200,000.00 while 28% spent quite an appreciable funds above 0200,000.00 to initiate farms in the gaps.

All respondents however claim the activity is profitably. They are eager to advise anybody, whether employed or unemployed, to go into the activity, if only he/she can acquire land.

5.8 CONSTRAINTS TO PRODUCTION

The main constraint faced by farmers include: theft of produce (33%); insufficient fund (31%); flood hazards ($17^{0}/_{6}$); constructional destruction of farms (15%); diseases and pests damage (10%); livestock damage to crops ($10^{1}/_{o}$); and poor/decreasing soil fertility (10%). Other constraints include lack of inputs (8%); labour shortage (6%); defecation/refuse damping on farm (4%); weed infestation 2%); and land ownership and its accompanied conflicts (2%).

Constraints to the fact that the activity is carried out in the KMA include theft of produce, flood hazards, destruction of farm due to construction activities and defecation/refuse dumping of on farms. Neither the residence nor the KMA ever complained about the activity being carried out in the metropolis.

Provision of financial resources ($46^{1}/_{o}$); adequate and timely supply in inputs (25%); and an increased education programmes for farmers (12%) are some suggestions to improve production. Other suggestions include making available and regular supply of labour (7%);opening avenues for the acquisition of more land (5%) and creating ways of improving the fertility of the land (3%). The rest of the view that the discovery and extension of flood control measures (2%), discovery and extension of prevalent weed control measures ($2^{1}/_{6}$), and also instilling good method of fencing of farms, would greatly improve production.

The educational programme should be structured in a way that would foster and fortify extension services to farmers. Respondents would improve production if technically equipped with production techniques in the gap.

5.9 CHANGE IN PRODUCTION AND MARKETING 5.9.1

Change in Production

Surprisingly, about 25% of total respondents express ignorance in terms of changes in production. While 24% indicate no change in production, 32% stress an increased production and 14% detect a decrease in production within the past 15 years. Other response to changes in production include decreasing soil fertility (2%), flooding in the gap worse of (2%) while another 2% respondents claim the gaps are o longer swampy within the past 15 years.

5.9.2 Changes in Marketing

Nearly 47% respondents are ignorant of changes in marketing and 24% express no change in marketing within the past 15 years. This is highly probably due to the subsistence consumption basis of production. While 22% respondents claim that
there is improved marketing avenue for the past 15 years, 7% respondents however, state reduced marketing due to low prices offered for produce.

5.9.3 Reduction 1 Expansion of the Enterprise

A large proportion (78%) of respondents claim the enterprise in the gap is expanding. The reasons given for the expansion include: (i) the enterprise is lucrative and a source of employment/food (45%); (ii) the enterprise is a means to minimise expenditure on food (25%); (iii) there is ready market for produce from the enterprise (4%); (iv) the enterprise enables one to obtain fresh and high quality produce (2%); (v) household sizes are increasing as the years go by (3%), hence a lot of people are trying to get solace in the enterprise.

Few respondents (2%) however, are of the view that there is reduction in the enterprise. This they attribute to the constructional destruction (18%) and scarcity of land in the gaps (2%). The rest 2%) respondents could not assign reason for the reduction.

5.9.4 Future Changes

Fifty five per cent of respondents anticipate a decrease in production and/or abrupt cessation of the activity in the future. The reasons are that:

- There may be upsurge alternative use of the land e.g. estate development, resettlement of market or lorry park, etc (23%);
- The area may be over flooded or unsuitable for cultivation (11%);
- Land may be scarce with associated disputes which discourages new entrants into the activity (19%), and
- Some farmers may abandon the activity when they acquire a better paid job/employment (2%).

However, 43% respondents believe that production may expand in the future. They attribute this to increase in crop variability and adaptability (8%) and more people going into production due to the benefit accruing to it (35%) in the future. Nearly 6% respondents foresee no change in the future.

It is suggested that the government should institute research into cultivation selection and method of cultivation, and improve extension services to production in the gap. With all these in place, respondents hope the activity would be the lifeline for not only farmers, but for the KMA and the nation at large.

6.0 ENVIRONMENTAL IMPACT ASSESSMENT OF URBAN AGRICULTURE IN KUMASI

It is important to recognize that considering the socio-economic aspect of an activity does not actually exhaust the full potential effect on human society. Hence the effects on quality of life has to be considered in all projects. The following was adopted as a procedure for evaluating the environmental impacts of the urban gap farming activity in Kumasi. This was an observational exercise and where necessary some discussions were held with farmers. The idea was to determine the impact of the farming activity as a whole and not on individual basis.

The main purposes are:

- to assess the environmental effects of the retrieval and consumption of the raw materials and other inputs during different life cycle phases of the activity;
- to access the disposal problem, if any, of the superseded products, process or activity; and
- to evaluate the environmental consequences of alternative processes and design concepts, permitting a comparison between products, processes, and activities.

Each phase is accorded a score on an environmental index for: effect on landform, land use, plant and animal life; use of natural resources; emissions to air, water and soil; noise; activity's procedures about economy, energy, work and public safety, population and human health, transport and traffic circulation, accident risk, waste handling; recycling, and ultimate disposal; and community reaction. The summary of the above attributes per each study area as indicated by the checklist (Appendix ...) is below:

6.1 SOUTH SUNTRESO ENVIRONMENTAL IMPACT ASSESSMENT

The environmental impacts of the farming activity in the South Suntreso urban gap is presented below.

6.1.1 Landform and Land Use

There is an indication that the activity may lead to formation of stream channels. No other drastic environmental effect is caused on the landform by farming in the area.

The activity in the South Suntreso gap does not alter the present nor planned land use in the area.

6.1.2 Air, Water, Noise and Waste

No objectionable odours is produced by the activity in the atmosphere. There are however, slight changes in drainage pattern, or rate and amount of surface water run off.

The amount of solid, liquid or gaseous waste produced, if any, is insignificant. Also the activity does not create nor increase existing noise levels or expose people to excessive noise.

6.1.3 Plant and Animal Life

Farming is a definite activity that alters the habitat of plants/animal life. The activity in the gap may (i) change the diversity or productivity of species or number of any species (plant or animal); (ii) introduce new species (plant/animal) into the area or create a barrier to the normal replenishment of existing species or to the migration/movement of animals; or (iii) cause emigration of animals due to human - wildlife interaction.

6.1.4 Natural Resources and Energy

The activity somehow increases the rate of use of land and water resources in the gap. The activity does not result in the use of substantial amounts of fuel or energy, in the form of fuelwood and other energy sources.

6.1.5 Public Services and Utilities

Farming in the gap may result in the need for new and/or alteration in some public services especially Agricultural Extension. However, there is no such need for new systems nor alteration to public utilities such as power/electricity or water.

6.1.6 Transportation and Traffic Circulation

The activity creates no traffic hazards to motor vehicles, cyclists or pedestrians. However, construction of access road or track may assist in transporting product from the farm gates.

6.1.7 Population and Human Health

Neither the location nor distribution of human population is affected by the activity. The scope of this study does not allow for an adequate assessment of this issue. However, there may be potential risks to health as people are exposed to the effects of chemicals, manure and other inputs.

6.1.8 Accident Risk and Community Reaction

No accident risk of explosion or release of potentially hazardous chemicals into the environment is envisaged by performing the activity. The activity is not potentially controversial, neither is it in conflict with locally adopted environmental plans nor regulations.

6.1.9 Economic and Aesthetic Values

Some beneficial effects on local or regional economic conditions are experienced. The activity apparently increases local income levels, enormously adds values to the land, and significantly leads to the employment of many.

Scenic vista or view open to the public is not changed by the activity. It also does not change the visual scale or character of the vicinity, nor create an aesthetically offensive site open to the public view.

6.2 SUBINIASOKWA ENVIRONMENTAL IMPACT ASSESSMENT

The Subin/Asokwa urban gap farming activity environmental impacts are depicted below:

6.2.1 Landform and Land Use

The activity in the study area does not significantly affect the landform. It may however, slightly affect or alter the planned land use of the area.

6.2.2 Air, Water, Noise and Waste

Farming activity in the gap releases no objectionable odours. There are however, slight changes in drainage patterns, or the rate and amount of surface water run offs or alterations to the course/flow of flood water.

Solid, liquid or gaseous waste produced by the activity, if any, is below the pollution threshold level. No noise is created by the activity nor people exposed to excessive noise.

6.2.3 Plant and Animal Life

There may be changes in the diversity or productivity of species or number of species. New species (plant/animal) may be introduced into the area. Or the activity may create a barrier to the normal replenishment of existing species. It can also create barrier to the migration or movement of animals. The farming activity in the gap can probably cause attraction, entrapment, or impingement of animal life, or emigration of animals due to human - wildlife interaction.

6 .2.4 Natural Resources and Energy

There is significant increase in the rate of use of Iand and water resources by the activity. It however, makes no substantial use of fuel or energy.

6.2.5 Public Services and Utilities

The activity calls for new Agricultural Extension and other government services to promote production. There is an alteration in water utility system hence the need for a new system for the area to enhance production.

6.2.6 Transportation and Traffic Circulation

No traffic hazards to motor vehicles, cyclists, or pedestrians is experienced. Access road or track is not very necessary since the area is quite accessible.

6.2 Population and Human Health

The activity does not effect the location or distribution of human population in the area. Just like the South Suntreso area, the results obtained to not allow a conclusion to be drawn on the effects on human health.

6.28 Accident Risk and Community Reaction

There is no risk of explosion or release of potentially hazardous chemicals into the environment. At the same time, the activity is not controversial neither is it in conflict with locally adopted environmental plans or regulations.

6 .2.9 Economic and Aesthetic Values

The activity has beneficial effects on local or regional economic conditions as elaborated below. It somehow encourage tourism due to the cultivation of exotic crops on commercial basis. It highly augments the local income levels, significantly increases land values, and a highly important source of employment for residents.

However, the activity can adversely change scenic vista or view open to the public. Subsequently, it changes the visual scale or character of the vicinity.

6.3 RACECOURSE ENVIRONMENTAL IMPACTASSESSMENT

Observations reveal some environmental impacts by the farming activity in the gap of the Race Course. These impacts are elaborated below.

6.3.1 Landform and Land Use

Farming activity in the gap does not cause extensive disruption to the soil, not even the ground contours of the landform are changed. Though the activity has no effect on the present land use, it may highly alter the planned land use of the area. Such planned land use - may include revamping the race course or market settlement

6.3.2 Air, Water, Noise and Waste

Apart from the activity changing drainage patterns, or the rate and amount of surface water run off, it has no effect whatsoever, on the air and even noise level. It does not generate significant waste which could lead to pollution.

6.3.3 Plant and Animal Life

The activity in the gap affects or slightly affects life form in some ways. It may change the diversity or productivity of species or number of any plant species. It can reduce the habitat or numbers of unique, rare or endangered plant or animal species. New plantlanimal species can be introduced into the area or creates barrier to the normal replenishment of species, or migration/movement of animals.

6.3.4 Natural Resources and Energy

Farming activity in the area highly increase the rate of use of certain natural resources such as land and water. However, no energy or fuel resources is utilized by the activity.

6.3.5 Public Services and Utilities

Apart from Agricultural Extension and Security Services, no other serious public services or utilities are required by the activity in the gap.

6.3.6 Transportation and Traffic Circulation

Farming in the gap causes no traffic hazards to motor vehicles, cyclist or pedestrians. It also does not call for construction of access roads or tracks because the area is accessible.

6.3.7 Population and Human Health

The location and distribution of human population in the area has not been affected by the activity. Results similar to South Suntreso and Subin/Asokwa were obtained for this area.

6.3.8 Accident Risk and Community Reaction

The activity involves no risk of explosion nor release of potentially hazardous chemicals into the environment. It is also not controversial nor in conflict with locally adopted environmental plants or regulations.

6.3.9 Economic and Aesthetic Values

Economic benefits of the activity includes avenues of employment, improved local income levels, and increased land values. The activity also does not create an aesthetically offensive site open to the public view nor change the visual scale of the vicinity.

6.4 CONCLUSION

Kumasi urban gaps crop production is environmentally friendly. However, some education by extensive provision of Agricultural Extension Services could harness the productivity of the gaps.

Encouragement of the appropriate use of other organic by-products could go a long way in improving the extent of production.

REFERENCES

Bowyer-Sower T & **Drakakis-Smith D (1996)** *The Needs of the Urban Poor versus Environmental Conservation: Conflict in Urban Agriculture.* Final Report Project R5946.

Colan Consult (1997). *Urban Environmental Sanitation Project. Preparation of Solid Waste Zoning Plans, Kumasi Metropolitan Assembly. Final Report.*

Garnett T (1996) *Growing Food in Cities. A report to* ***highlight*** *and promote the benefits of urban agriculture in the UK.* National Food Alliance / Safe Alliance.

Koc M, MacRae R, Mougeot Luc JA & **Welsh J (1999).** *For Hunger proof Cities. Sustainable Urban Food Systems.* IDRC Canada 1999.

Quou, S (1999). *Planning for Urban Agriculture: A Review of Tools and Strategies for Urban Planners.* IDRC Cities Feeding People Series Report 28.

Sumberg J (1996) *Livestock Production in peri- Urban Areas of Africa: An Analysis of Dar-es-Salaam, Mwanza and Shinyanga, Tanzania.* Overseas Development Group, UEA for RNRRS LPP grant X0290.

UNHCS (1996) *An Urbanising World : Global Report on Human Settlements, 1996* OUP UNHCS (Habitat).

APPENDIX 1. Summary of data collected for the three gaps.

1. THE CULTIVATOR

	SS	SA	RC	TOTAL	%
GENDER					
Male	17	20	12	49	83.1
Female	4	6	0	10	16.9
Total Respondents	21	26	12	59	
AGE					
< 30 years	4	3	2	4	15.3
31- 50 years	10	14	6	30	50.8
51 - 70	4	8	4	16	27.1
71+ "	3	1	0	4	6.8
Total Respondents	21	26	12	59	
HOUSEHOLD SIZE					
Small (< 4 persons)	6	6	3	15	25.4
Medium (5 - 7 persons)	8	9	5	22	37.3
Large (8+ persons)	7	11	4	22	37.3
Total Respondents	21	26	12	59	

Household size range: 1 - 21; Average household size: 6.5

EDUCATIONAL LEVEL					
Tertiary	1	2	0	3	5.1
Secondary / Technical	5	5	2	12	20.3
Middle / JSS	9	9	0	18	30.5
Primary	0	3	4	7	11.9
Illiterate	6	7	6	19	32.2
Total Respondents	21	26	12	59	

OCCUPATION	SS	SA	RC	TOTAL	%
Labourer	4	11	1	16	27.1
Farmer	3	7	3	13	22.0
Artisan	2	2	4	8	13.6
Prison Officer	6	0	0	6	10.2
Trader/Retailer	3	2	0	5	8.5
Watchman	1	1	2	4	6.8
Banker	0	1	0	1	1.7
Caterer (cooked food seller)	0	1	0	1	1.7
Driver	0	0	1	1	1.7
Priest	1	0	0	1	1.7
Police Officer	0	1	0	1	1.7
Porter	0	0	1	1	1.7
Secretary (officer practicer)	1	0	0	1	1.7
Total Respondents				59	

ETHNIC ORIGIN					
Upper East	7	9	11	27	45.8
Upper West Northern origin	0	2	0	2	3.4
Ashanti	7	4	0	11	18.6
Volta	3	3	0	6	10.2
Central	1	5	0	6	10.2
G. Accra	0	2	0	2	3.4
B. Ahafo Other southern sector	1	1	0	2	3.4
Eastern	1	0	0	1	1.7
Burkina Faso - Outside Ghana	1	0	1	2	3.4
Total Respondents				59	

YEARS IN KUMASI	SS	SA	RC	TOTAL	%
< 10 years	12	5	2	19	32.2
1 1 - 30 years	2	11	7	20	33.9
31 - 50	5	10	3	18	30.5
51+ "	2	0	0	2	3.4
Total Respondents				59	

LOCATION OF DWELLING PLACE

< 1 km	13	12	11	36	61.0
1 - 4 km	4	5	1	10	16.9
5 - 8 "	2	6	0	8	13.6
9+ "	2	3	0	5	8.5
Total Respondents				59	

KNOWLEDGE OF PREVIOUS CULTIVATORS

YES	11	13	7	31	52.5
NO	10	13	5	28	47.5
Total Respondents				59	

NUMBER OF PREVIOUS CULTIVATORS

One	7	13	6	26	83.9
Two	2	0	1	3	9.7
Three	1	0	0	1	3.2
Four	0	0	0	0	0.0
Five {+}	1	0	0	1	3.2
Total Respondents	11	13	7	31	

2. CROPPING AND PLACE IN LIVELIHOOD

CROPS BY PREVIOUS CULTIVATORS	SS	SA	RC	TOTAL	%
Banana/plantain	3	8	3	14	45.2
Maize	3	5	5	13	41.9
Sugarcane	6	5	2	13	41.9
Cassava	2	4	3	9	29.0
Water cocoyam (taro)	2	3	0	5	16.1
Okro (okra)	4	0	0	4	12.9
Cocoyam/kontomire	2	2	0	4	12.9
Garden egg	3	0	0	3	9.7
Oil palm	1	2	0	3	9.7
Yarn	1	1	0	2_	6.5
Cabbage	1	0	1	2	6.5
Lettuce	1	0	1	2	6.5
Alefi	1	0	0	1	3.2
Ayoyo	1	0	0	1	3.2
Cowpea	0	1	0	1	3.2
Pepper	0	1	0	1	3.2
Tomato	0	0	1	1	3.2
Green peas/beans	0	0	1	1	3.2
Cucumber	0	0	1	1	3.2
Green pepper	0	0	1	1	3.2
Pawpaw	1	0	0	1	3.2
Coconut Sweet	1	0	0	1	3.2
potato	1	0	0	1	3.2

Total numbers of farmers = 31

PERIOD OF CULTIVATION BY RESPONDENTS	**SS**	**SA**	**RC**	**TOTAL**	**%**
<1 year	1	2	1	4	6.8
1 - 5 years	12	7	7	26	44.1
6 - 1 0	2	7	3	12	20.3
1 1 - 1 5	1	5	0	6	10.2
16-20	2	2	0	4	6.8
21+	3	3	1	7	11.9
Total respondents				59	

CROPS CULTIVATED BY RESPONDENTS	SS	SA	**RC**	**TOTAL**	**%**
Banana/plantain	20	19	10	49	83.1
Casava	12	18	8	38	64.4
Maize	10	11	11	32	54.2
Water cocoyam (taro)	11	10	3	24	40.7
Cocoyam	6	9	5	20	33.9
Sugar cane	9	9	2	20	33.9
Yam	1	3	1	5	8.5
Cowpea	0	4	5	9	15.3
Groundnut	0	0	2	2	3.4
Garden egg	3	8	1	12	20.3
Ayoyo	6	2	3	11	18.6
Alefi	5	1	3	9	15.3
Okro	0	8	1	9	15.3
Pepper	1	4	2	7	11.9
Cabbage	1	5	0	6	10.2
Tomato	0	3	2	5	8.5
Lettuce	0	3	0	3	5.1
Spring onions	0	3	0	3	5.1
Carrot	0	2	0	2	3.4
Cucumber	0	2	0	2	3.4
Green pepper	0	2	0	2	3.4
‘Sure’ (kenaf)	0	0	2	2	3.4
Oil palm	7	10	0	17	28.8
Mango	2	2	2	6	10.2
Pawpaw	1	4	0	5	8.5
Avocado pear	0	1	1	2	3.4
Coconut	1	1	0	2	3.4
Sour sop	1	0	1	2	3.4
Orange	0	1	0	1	1.7
Sunflower	0	1	0	1	1.7

CROPS CULTIVATED BY RESPONDENTS		SS	SA	RC	TOTAL	%
CROPPING PATTERN						
Multiple cropping		18	21	10	49	83.1
Multiple & rotational	mixed	2	0	2	4	6.8
Rotational cropping		0	1	0	1	1.7
Monocropping	mono	1	4	0	5	8.5

Total number of respondents = 59

SIZE OF HOLDINGS					
< 1.0 acres	6	5	5	16	27.6
1.0 - 1.5 acres	6	8	4	18	31.0
2.0 - 2.5	3	5	1	9	15.5
3.0-3.5	1	2	0	3	5.2
4.0 - 4.5	3	3	1	7	12.1
5.0+	2	3	0	5	8.6

Total number of respondents = 58

Range of holding: 0.1- 6.0 acres; Average holding: 1.9 acreas.

REASON FOR FARMING	SS	SA	RC	TOTAL	%
Source of employment & income	0	0	2	2	3.4
Source of family income & food	12	15	2	29	49.2
Supplement family income	0	0	2	2	3.4
Supplement household meal	7	11	6	24	40.7
Improve household food security	2	0	0	2	3.4

OTHER AGRIC. ACTNITY					
Poultry	1	5	4	10	47.6
Poultry & small ruminants keeping	0	0	2	2	9.5
Small ruminants rearing	0	1	1	2	9.5
Fishery	1	2	0	3	14.3
Snail keeping	0	2	0	3	14.3
Piggery	0	1	0	1	4.8

Total number of respondents = 21

3. TREE PLANTING AND MANAGEMENT

TREES ON FARM	SS	SA	RC	TOTAL	%
Yes	15	18	10	43	72.9
No	6	8	2	16	27.1
TREES INTENTIONALLY GROWN					
Yes	10	11	4	25	58.1
No	5	7	6	18	41.9
Total number of respondents = 43					
SOURCE OF PLANTING MATERIAL					
Private Nursery	8	10	3	21	84.0
Wildings	1	1	1	3	12.0
Open Market	1	0	0	1	4.0
Total number of respondents = 25					
TYPE OF PLANTING MATERIAL					
Seed	7	9	4	20	80.0
Seedling	2	5	0	7	28.0
Vegetative cutting	3	3	0	6	24.0
Total number of respondents = 25					
FUNCTIONS/USES OF TREES					
Product	7	9	5	21	48.8
Service	4	3	2	9	20.9
Product & Service	7	6	3	16	37.2
Total number of respondents = 43					
CARE AT EARLY GROWTH					
Only weeding	7	3	5	15	34.9
Weeding & protection against livestock	0	5	0	5	11.6
Only protection against livestock	5	0	3	8	18.6
Weeding and watering	2	1	0	3	7.0
Weeding, watering & protection	0	4	0	4	9.3
Weeding, watering &fire protection	0	1	0	1	2.3
Only watering	0	0	2	2	4.7
No care	1	4	0	5	11.6
Total number of respondents = 43					

4. TENANCY AND SECURITY OF	SS	SA	RC	TOTAL	%
Government	5	13	2	20	33.9
Railway Corporation	0	11	0	11	18.6
Prison Service Authority	8	0	0	8	13.6
State Housing Corporation	6	0	0	6	10.2
Volta River Authority (VRA)	0	1	0	1	1.7
Ministry of Food and Agric (MOFA)	0	1	0	1	1.7
Kumasi Metropolitan Assembly (KMA)	0	0	1	1	1.7
Private Individual	2	0	5	7	11.9
Stool	0	0	3	3	5.1
Don't know	0	0	1	1	1.7
SECURITY					
Well secured	19	26	9	54	91.5
Not secured	2	0	3	5	8.5

HUSBANDRY PRACTICES

INPUTS USED	SS	SA	RC	TOTAL	%
Fertilizer/Chemicals	4	4	3	11	18.6
Manure	1	0	3	4	6.8
Fertilizer and manure	1	7	0	8	13.6
No inputs	15	15	6	36	61.0
CROP PROTECTION	SS	SA	RC	TOTAL	%
Clean weeding	17	20	9	46	78.0
Wood ash	0	1	3	4	6.8
Chemical protection	1	4	2	7	11.9
Fencing	3	0	0	3	5.1
Neem leaf concotion	0	1	0	1	1.7
USE OF LABOUR					
Yes	7	17	7	31	52.5
No	14	9	5	28	47.5

COST OF LABOUR					
< 050,000.00	2	11	3	16	51.6
051,000.00 - 0200,000.00	3	6	4	13	41.9
¢200,000+	2	0	0	2	6.5
Total Number of Respondents = 31					
DISPOSAL OF CROP RESIDUES					
Left on farm	19	20	9	48	82.8
Burnt	2	4	1	7	12.1
Animal feed & left on farm	0	2	0	2	3.4
Animal feed	0	0	1	1	1.7
				58	

6. **ADVICE ON PRODUCTION**

RECEIVE ADVICE	**SS**	**SA**	**RC**	**TOTAL**	**%**
No	16	18	11	45	76.3
Relatives, friends, etc.	4	4	0	8	13.6
MOFA	1	3	1	5	8.5
GOAN	0	2	0	2	3.4
				59	

7. **MARKETING**

CROP DISPOSAL	**SS**	**SA**	**RC**	**TOTAL**	**%**
Home consumption & sold to the market	11	20	5	36	61.0
Home consumption only	10	4	6	20	33.9
Mainly commercial	0	2	1	3	5.1
PRODUCE SOLD					
1. Sugar cane	7	4	2	13	33.3
2. Banana/plantain	2	2	2	6	15.4
3. Taro	2	2	0	6	15.4
4. Cassava	2	2	0	4	10.3
5. Oil palm	0	4	0	4	10.3
6. Garden egg	1	2	0	3	7.7
7. Cocoyam	0	3	0	3	7.7
8. Tomato	0	0	2	2	5.1
9. Cabbage	0	2	0	2	5.1
10. Maize	0	2	0	2	5.1
11. Okro	0	2	0	2	5.1
12. Spring onion	0	2	0	2	5.1
13. Alefi	1	0	0	1	2.6
14. Ayoyo	1	0	0	1	2.6
15. Carrot	0	1	0	1	2.6
16. Cucumber	0	1	0	1	2.6
17. Lettuce	0	1	0	1	2.6
18. Green pepper	0	1	0	1	2.6

Total Number of Respondents = 39

PRODUCED CONSUMED	SS	SA	**RC**	**TOTAL**	**%**
Maize	6	12	12	30	50.8
Banana/plantain	13	9	4	26	44.1
Cassava	8	10	7	25	42.4
Cocoyam	2	5	3	10	16.9
Taro	6	2	1	9	15.3
Pepper	1	3	2	6	10.2
Cabbage	0	2	0	2	3.4
Garden egg	1	2	0	3	5.1
Olao	0	2	0	2	3.4
Cowpea	0	1	4	5	8.5
Groundnut	0	0	2	2	3.4
Lettuce	0	1	0	1	1.7
Alefi	2	1	1	4	6.8
Ayoyo	2	1	1	4	6.8
Tomato	0	1	0	1	1.7
Sugar cane	1	1	0	2	3.4
Yam	0	1	0	1	1.7
Oil palm	2	2	0	4	6.8
Pawpaw	0	2	0	2	3.4
Kenaf (sure)	0	0	1	1	1.7
Mango	1	0	0	1	1.7
AMOUNT CONSUMED BY THE FARMING FAMILY					
$^{10/}10$	10	4	6	20	33.9
$^{9}/_{10}$	0	3	0	3	5.1
8/10	2	1	0	3	5.1
$^{7}/10$	2	2	0	4	6.8
$^{6}/10$	0	1	2	3	5.1
$^{5}/10$	0	4	2	6	10.2
$^{4}/10$	1	1	0	2	3.4
$^{3}/_{10}$	1	4	1	6	10.2
$^{2/}10$	3	2	0	5	8.5
$^{1/}10$	2	4	1	7	11.9
				59	

8. ENTRY AND PROFITABILITY

HOW ENTERED ACTIVITY	SS	SA	RC	TOTAL	%
Have pleasure in farming (hobby)	8	12	10	30	50.8
Took over from previous owner	4	6	2	12	20.3
Advised into activity	4	4	0	8	13.6
Have enough land idle at premises	4	2	0	6	10.1
Enhance environmental quality	1	0	0	1	1
Prevent snake encroachment	0	2	0	2	3.4
				59	

NEED FOR TRAINING					
Yes	9	13	5	27	45.8
NO	12	13	7	32	54.2
				59	

PERIOD OF TRAINING	SS	SA	RC	TOTAL	%
< 1 month	5	4	1	10	38.5
1 month - 6 months	2	5	2	9	34.6
7 months - 1 year	0	1	1	2	7.7
1.5 years - 5 years	1	0	1	2	7.7
5 years +	1	2	0	3	11.5
				26	

CAPITAL NEEDED TO START					
< 050,000	14	2	3	19	34.5
051,000 - 0200,000	5	10	6	21	38.2
0200,000+	2	11	3	15	27.5
				55	

9. CONSTRAINTS AND CHANGES

	SS	SA	RC	TOTAL	%
Theft of produce	4	7	5	16	33.
Insufficient fund	4	10	1	15	31.
Flood hazards	3	5	0	8	16.
Constructional destruction	0	5	2	7	14.
Diseases/pest damage	3	2	0	5	10.
Livestock damage	1	1	3	5	10.
Poor soil fertility	1	4	0	5	10.
Weed Infestation	1	0	0	1	2.
Lack of inputs	0	0	4	4	8.
Labour shortage	2	1	0	3	6.
Defecation/refuse dumping on farm	2	0	0	2	4.
Land ownership/conflict	1	0	0	1	2.
				48	

HOW TO IMPROVE PRODUCTION	SS	SA	RC	TOTAL	%
Make available more financial resources	10	8	9	27	45.
Adequately and timely supply inputs	3	9	3	15	25.
Increase educational programmes	3	4	0	7	11.
Make available more land	2	1	0	3	5.
Availability and regular supply labour	1	3	0	4	6.
Improved fertility of land	0	2	0	2	3.
Discover & extend flood control measures	1	0	0	1	1.
Instill good fencing of farm	1	0	0	1	1.
Discover control of prevalent weeds	0	1	0	1	1.
				59	

10. CHANGES IN PRODUCTION AND MARKETING

PRODUCTION	SS	SA	RC	TOTAL	%
Increased production	7	11	1	19	32.2
Decreased production	2	2	4	8	13.6
Decrease in soil fertility	1	0	0	1	1.7
Flooding worse of	1	0	0	1	1.7
Ignorant of change	9	6	0	15	25.4
No change	1	6	7	14	23.7
Land no longer swampy	0	1	0	1	1.7
				59	

MARKETING					
Improved marketing	4	6	2	12	21.8
Low prices for produce	3	1	0	4	7.3
Ignorant of change	12	14	0	26	47.3
No change	2	5	6	13	23.6
				55	

REDUCTION/EXPANSION OF ENTERPRISE	SS	SA	RC	TOTAL	%
Increasing	19	23	3	45	77.6
Decreasing	2	3	8	13	22A
				58	

REASON{S}					
To minimize expenditure on food	9	4	1	14	25.2
Lucrative & source of employment/food	8	16	1	25	45.2
Obtain fresh & high quality produce	1	0	0	1	1.8
Ready market for produce	1	1	0	2	3.6
Increasing household size	0	1	0	1	1.8
Good soil fertility	0	0	1	1	1.8
Scarcity of land	1	0	0	1	1.8
Constructional destruction	0	2	8	10	18.2
				55	

FUTURE CHANGES					
Production will increase	5	11	2	18	34.6
Land scarcity/dispute	4	6	0	10	19.2
Land be used for other purpose (e.g. estate development	3	2	7	12	23.1
Area will be flooded/unsuitable	3	3	0	6	11.4
No change	3	0	0	3	5.8
Increase in crop variability	0	4	0	4	7.7
Abandon farming for better job	0	0	1	1	1.9
				52	

KUMASI NATURAL RESOURCES MANAGEMENT PROJECT: URBAN GAPS CROP PRODUCTION STUDY

CHECKLIST/INTERVIEW GUIDE

CODE NUMBER----------

A) **ECONOMIC ACTIVITY/SOCIO-ECONOMIC DATA**
(The cultivator or gatherer)

1.Are you engaged in: a) farming, b) plant gathering or c) both?

2.What is your main occupation? ----------

3.Gender: Male ------ Female---

4.Age ----------

5.Ethnic origin ----------

6.Number of years resident in Kumasi ----------

7.Approximate size of farm ----------(note location and extent of the plot as precise as possible for entry into GIS)

8.Where is your house located?----------

9.What is the approximate distance from your home to the farm? ----------

10.How did you first enter into this business/activity?----------

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11.How much capital is was used to start?--

12.Does one need some training? Yes / No

13.If Yes, how much training is needed? (duration) ----------

14.Would you recommend this business/activity to someone looking for work? (to assess profitability) Yes / No

15.If Yes (or) No, Why? ----------

16.What is your family size? ---------- (actual number of people living in the household).

17. What is your highest educational level? (primary, JSS/middle school, SSS, Tertiary, other)

B) LAND OWNERSHIP/TENURE ARRANGEMENT

1. Who owns the land?

   A)Govt

   B)Stool

   C)Family

   D)Private Individual

   E)Business

   F)other; specify

2. Who cultivates the land? A)Land owner B)Tenant
3. Are there any tenure agreements on the land ? Yes/No
4. If Yes; What are they?----------

---

5. How secure are these arrangements?----------

C) CROPPING HISTORY /HUSBANDRY PRACTICES

1. Do you know about previous cultivators of this land? Yes /No
2. If Yes; how many of them do you know about? (state number) ----------
3. Can you list some of the crops of previous cultivators? ----------

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4. What are your reasons for engaging in this activity? (that is cultivation and /or gathering)-----

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5. How long have you been cultivating this plot?----------

6. Could you please give a complete list of all crops grown or gathered? (include Ieafy vegetables, water cocoyam, sugarcane, tree crops, herbs, wild plants even firewood)

7.How are they grown? (Rotations, mono/multiple cropping) ----------

---

8.What inputs are normally used on the crops? (eg fertilizers, pesticides, weedicides,

manure etc) ----------

9.Where are the inputs obtained?

10.Are chemicals used for crop protection? Yes/No

11.If Yes, (or) No, what (other) crop protection measures are used?

12.Do you receive advice on this form of production? Yes/ No

13.If Yes, what advice is given?

14.Who gives this advice? ----------

15.How often /frequently is it given?----------

16.Is paid labour used to produce the crops? Yes /No

17.If Yes, how much are they paid? ----------

18.Are you engaged in any other agricultural activities? ----------

---

D) USE OF CROPS / MARKETING

1.How are the crops disposed oP (eg, home consumption, sold in the market etc }

2. Are the crops processed before sale? Yes /No

3.If Yes, what processing is done?

4.Who does this processing? ----------

5.Which crop is mostly consumed at home and which is mainly sold for cash?

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6. How much is consumed by the farming/gathering family? (on a scale of 1-10 parts) -

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7.What happens to the rest that is not consumed?

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8. How are crop residues/by products used? (e.g. for animal feed, soil improvement, wasted /burnt, used in building materials.

E) TREE PLANTING AND MANAGEMENT

1. Are there trees on your farm? Yes /No

2.If Yes, what trees are there? (list local or English names)

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3. What are the intended functions? (include both products and services) ----------

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4.Are the trees intentionally grown? Yes/No

5. If Yes, is the tree planted as a monocrop or in association with other plants?

6.If associated with other plants.What are they?

7.What is the planting arrangement?

8.Source of planting material? (gov't, private nurseries wildings etc.)

9.If planting material is obtained, what type of planting material e.g. seeds, seedlings, vegetative cuttings etc.

10.What is the care required /given during the establishment phase?(watering,

weeding, protection from livestock and pests etc)

11.What tree management methods are used? (Pollarding, coppicing, lopping, thining, Headback other forms of pruning)

12. What harvesting methods are used? (general timing and harvesting system,

reasons for harvesting)

F) CONSTRAINTS TO PRODUCTION

1. Do you (farmer/gatherer) face any constraints? Yes/ No
2. If Yes, what are the main ones?.

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3. Which of these are peculiar to the fact that the activity is carried out in KMA?

4.Have there ever been complaints from residents or KMA authorities about this activity in the municipality? Yes/ No

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5.What can be done to improve production?

G) ENVIRONMENTAL IMPACTS

(Student should assess general environmental impacts, not necessarily on an individual producer basis). Note possible effects of the system and discuss as appropriate with respondent, on the following:.

landform
air
water
solid waste management
noise
land use
plant life, animal life
other natural resources
energy
public services
utilities
transport & traffic circulation,
population
accident risk
human health
economic
community reaction,
aesthetics

H) CHANGES

1.What are the main changes in the farm of production and marketing within the last 15 years? (since 1984)

Table 3.17b: **Proportion of total produce consumed by respondents in the Subin/Asokwa Gap**

Proportion	Percentage	Number of respondents	% of Total Sample
1/10	10	4	16.00
2/10	20	2	8.00
3/10	30	4	16.00
4/10	40	1	4.00
5/10	50	4	16.00
6/10	60	1	4.00
7/10	70	2	8.00
8/10	80	1	4.00
9/10	90	3	12.00
10/10	100	4	16.00
Total Number of Respondents	= 25		

Table 3.18: How respondents entered into the activity in the Subin/Asokwa Gap

Response	Number of respondents	% of Total Sample
Have pleasure in farming (hobby)	12	46.16
Took over from previous owner	6	23.08
Was advised into activity	4	15.38
Have enough land at premises	2	7.69
Prevent snake encroachment	2	7.69
Total	26	100.00

3.8.2 Duration of training and initial capital needed for the enterprise

In view of Table 3.19a, half of the total sample contended that some training is necessary for a newcomer into the activity. The duration of training varied from a week to 10 years.

From Table 13.19b, 41.7% of respondents who felt training was necessary proposed 1 - 6 months while 33.3% were of the view that less than a month's training can equip new entrants. Over five years training was expressed by 16.7% of respondents whereas 8.3% claimed a training period of 7 months to one year as ideal for the newcomers.

2. Is the number of such enterprises increasing /decreasing?

3. If increasing or decreasing Why?

4. What changes do you think will happen in future?

I) ADP

Indicate location of land plots used and location of dwellings, draw a rough sketch of plots surveyed and dwellings of respondents for entry into GIS.