

**SOCIOECONOMIC SURVEY OF TRADITIONAL / COMMERCIAL PRODUCTION
OF COCOYAM LEAF FOR RTIMP**

A REPORT ON:
**PRODUCERS AND TRADERS OF COCOYAM LEAVES IN THE
ASANTE AKIM NORTH AND SOUTH DISTRICTS**

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1.0 INTRODUCTION

1.1 Background

Cocoyam, *Xanthosoma* spp., is cultivated in tropical regions for human nutrition, animal feed, and cash income for the farmers (Onwueme, 1988). Cocoyam is vegetatively propagated using the corms and to a lesser extent the cormels. As food for human consumption, the nutritional value of the various parts of cocoyam is primarily caloric. The underground cormels provide easily digested starch; and the leaves are nutritious spinach-like vegetable, which give a lot of minerals, vitamins and thiamine (Wilson, 1984; Jennings, 1987; Bown, 2000). Liefstingh (1963) indicated that the leaves have a protein content of 22.17g per 100g dry weight. In Ghana cocoyam is generally grown by small-scale farmers and therefore cocoyam farms under intensive management are highly limited. Since cocoyam tolerates shade, the crop is frequently grown in intercropping systems together with permanent crops such as banana, coffee, coconut, rubber, oil palm and cocoa (Wilson, 1984; Bown, 2000). Cocoyam leaf for example is still produced on subsistence basis and pickers who are not farmers dominate the harvesting and marketing of cocoyam leaves in areas like the Asante Akim South and district (Osei-Agyemang et al; 2003).

Despite the usefulness of cocoyam leaves as enumerated above, the cocoyam leaf industry in Ghana is beset with problems. Some of these problems are;

- a) Lack of sustainable production through the year as a commercial activity. Although cocoyam leaf production and marketing has been commercialized, typical commercial farms solely for cocoyam leaf production as done in other countries (Caribbean regions and Tropical Asia) is lacking in Ghana. Mostly cocoyam leaf is seen as a by-product from cocoyam production.
- b) Cocoyam and for that matter its leaf production has been severely affected by the alarming rate of forest degradation in Ghana as the bulk grow in forest areas after the clearing of virgin forests and previously cocoyam cultivated areas which have been fallowed. The buried corms and cormels in the soil sprout in large populations when favourable conditions are present after clearing the vegetation cover.
- c) Lack of improved varieties for commercial cocoyam leaf production. The harvesting of leaves of these local varieties as a leafy vegetable at certain stages of growth (especially at bulking) has been observed as a constraint for the crop's production and productivity. Ghana has not officially released any improved cocoyam variety for farmers, not to mention one developed specifically for leaf production as found elsewhere.
- d) Cocoyam leaf poses major challenges with respect to distribution and marketing because of its highly perishable nature
- e) Inadequate research on cocoyam (and for that matter commercial cocoyam leaf production) as compared to other root and tuber crops. Literature on Ghanaian cocoyam leaf production is therefore scanty and not readily available for current needs and expectations. It is therefore imperative to undertake intensive research on these critical areas of the crop.

This survey/activity being sponsored by The Root and Tuber Improvement and Marketing Programme (RTIMP) therefore seeks to address some of the problems identified above. The Root and Tuber Improvement and Marketing Programme (RTIMP) seek to enhance food security and improve

livelihoods of the rural poor. The main purpose of the programme is to build competitive and market based root and tuber commodity chain supported by relevant, effective and sustainable service available to the rural poor.

1.2 Objectives

The main objective of this survey was to provide a thorough description of the traditional and/or commercial cocoyam leaf production and marketing systems from the farm to the consumer in the selected growing areas in the Ashanti, Brong Ahafo and Eastern regions. Specific objectives were the following:

1. To identify producers, traders/pickers and consumers of traditional and/or commercial cocoyam leaf and their socio-economic characteristics; location, gender, number of varieties of cocoyam grown.
2. To investigate the agronomic practices and gender specific roles, scale of production, yield per unit area of leaves and of cormels
3. To assess costs of producing a hectare of cocoyam for leaves and cormels together, or separately and the profitability of the enterprise;
4. To find out whether there are varieties that are favoured for leaf production only (because of the yield of leaves compared to yield of cormels), or varieties suitable for leaf production because of market preference for its leaves and if there are varieties suitable for cormel production only;
5. To investigate the organization of marketing, identify major market centres and roles of actors involved within the selected districts
6. To identify the seasonality of demand and supply of traditional/commercial cocoyam leaf
7. To estimate the volume of the traditional/commercial cocoyam leaf sold and frequency of sales within the selected market;
8. To find out price trends at the producer, the agent/middleman, wholesale, and retail levels;
9. To provide comprehensive description of the constraints to production and marketing of cocoyam leaf, the coping strategies; and
10. To make suggestions and recommendations based on the above for a comprehensive production and marketing strategy for cocoyam leaf.

1.3 Scope of Work

The deliverables of this survey were as follows:

- 1) A comprehensive data on the socio-economic characteristics of cocoyam leaf growers and traders/pickers,
- 2) Detailed cocoyam leaf harvesting and marketing information (seasonality of demand and supply, major market centres, consumer preferences as perceived by traders, etc, etc),
- 3) Constraints to cocoyam leaf production and marketing from the perspective of growers, traders/pickers and the researcher and opportunities for improving production and marketing,
- 4) Detailed report covering a comprehensive review of the state of the cocoyam leaf enterprise, issues that needs to be addressed and strategies to overcome them to make the sector attractive to growers, traders/pickers, entrepreneurs towards reducing rural poverty to improve livelihoods.
- 5) Recommendations for specific varietal development and improvement in cultivation systems (carefully designed spot interventions) that will enhance productivity
- 6) Recommendations for Post harvest improvement

2.0 METHODOLOGY

2.1 Selection and Sampling of Districts

Table 1 shows the districts that were selected for the assignment. Criteria for selection of survey areas include the following:

- Environmental suitability for Cocoyam production
- Scale of production/production levels
- Market accessibility
- Consumption trends using secondary data/information

Based on the above criteria selected districts for the survey were:

1. Asante Akim (North & South) districts in the Ashanti region
2. Fanteakwa (Begoro Area) district in the Eastern region
3. Asunafo North in the Brong Ahafo region

In order to ensure that the sample was adequately representative, a two-state stratified random sampling technique was used in the conduct of the survey. In each of the selected districts, a random sampling technique was used to select the required number of communities/villages from the sampling frame by the Statistics, Research and Information Directorate of the Ministry of Food and Agriculture. From this list, a simple random sample technique without replacement was applied to select the desired number of beneficiary households upon which valid inferences could be drawn for the cocoyam farming population of the entire project District.

Table 2.1: Distribution of Respondents by district

| District | Freq. | % |
|-----------------------------|------------|--------------|
| Fanteakwa | 150 | 33.33 |
| Asante Akim South and North | 150 | 33.33 |
| Asuanfo North | 150 | 33.33 |
| Total | 450 | 100.0 |

Source: Field Survey, 2008

2.2 Data, Research Procedure and Analytical Methods

The study collected both qualitative and quantitative data on the relevant variables stated in the objectives. Based on the objectives and scope of the work and the expected outputs as stipulated above, the consultants followed the under listed set of approaches to accomplish the assignment:

1. Start-up activities and desk studies.
2. Consultation with relevant institutions and design of instruments for data gathering.
3. Training of field officers on administration of survey questionnaires.
4. Field pre-testing of survey questionnaires.
5. Field studies (data collection) in the selected districts.
6. Data processing and analysis.
7. Preparation of draft report.
8. Key stakeholder forum of draft report for validation.
9. Submission of final report.

2.2.1 Start-up Activities

The consultants and the client signed the contract and agreed on milestones as well as coordination issues and quality assurance procedures or measures. Desk studies focusing mainly on gathering relevant literature on the assignment were undertaken. Various reports including 2000 Population and Housing Census, District Data and Implications for Planning, Development Plans of the districts, and other relevant documents from the District Assemblies and District MOFA offices were sought.

2.2.2 Recruitment and Training of Field Officers for Questionnaire Administration

Field officers were recruited and trained for the administration of the survey questionnaires in the selected districts. Preliminary consultations were held with officials of MOFA in all the districts surveyed. The visits were undertaken among other things to:

- Familiarize with the local terrain and establish working relations.
- Select enumerators for training on data collection instruments.

2.2.3 Pre-testing of Survey Questionnaires

The designed survey instruments were pre-tested in some of the selected districts. The output of this was used to improve on the data gathering instruments.

2.2.4 Detailed Field Survey

The survey was essentially participatory using the following tools:

- Key informant interviews
- Focus group discussions
- Structured questionnaires
- Semi-structured interviews
- Observations

2.2.4.1 Key Informant Interviews

Key informant interviews targeted prime stakeholders in the districts. Among these were key personnel of the District Assemblies, including District Coordinating Directors, District Planning Officers and the District Directors of Agriculture. Others were leaders of local communities and trade associations in the districts.

2.2.4.2 Focus Group Discussion

Focus group meetings were held with selected relevant groups such as producers, processors and traders of roots and tubers (Meuser and Nagel 2002; Borgatti 1999). The discussions were useful for triangulation and consensus building on key indicators. A checklist was prepared to aid the exercise and also to enhance quantitative analysis of information gathered.

2.2.4.3 Questionnaire Administration

The consultants supervised and monitored the field officers in the administration of the questionnaires. This was necessary to ensure reliable data collection.

2.2.5 Data Analysis

Data was cleaned, validated before inputting / data entry and analyzed using SPSS version 16. Both descriptive and inferential methods of analysis of data were employed. The descriptive tools included frequency tables, cross tables, charts (pie and bar), percentages and descriptive summaries (mean, median, mode etc) of the quantitative variables.

3.0 SURVEY FINDINGS (PRODUCERS)

3.1. Asante Akim (North & South) District Profile

3.1.1 Location and Size

The Asante Akim district is divided into North and South with Konongo-Odumasi and Juaso as their respective capitals. They are located in the Ashanti Region. The two districts were carved out of the erstwhile Asante Akim District Council in 1988 as part of the Ghana's Decentralization Process. The Asante Akim North Municipal is located in the eastern part of Ashanti Region and lies between latitude 60° 30' North and 70° 30' North and longitude 00 15' West and 10° 20' West. It covers a land area of 1,160 sq. km with an estimated population of 142,434 for 2006 (projection from 2000 Population Census). The Municipal shares boundaries with Sekyere East on the north, Kwahu South on the east, Asante Akim South on the south and Ejisu-Juaben Municipal on the west.

The Asante Akim South District is situated on the eastern part of Ashanti region. It is the main gateway to Eastern and Greater Accra regions. Its eastern border forms part of the regional boundary dividing the Ashanti and Eastern Regions. The District also shares common boundaries on the North and North-West with Asante Akim North District and Kwahu South District on the West. On the South-West lies Amansie East District and on the South-East is Birim North District in the Eastern Region. The total surface area of the district is about 1217.7km² (472.4 sq miles) and it forms about five per cent (5%) of the total area of the Ashanti Region, and 0.5 per cent of the total area of the country.

3.1.2 Demographics

The 2000 Population and Housing Census put the population of the Asante Akim North and South Districts at 126,477 and 96,868 with annual growth rate of 2.0 and 2.3 % per annum respectively. The population of the north is made up of 45.4% males and 54.6% females with an average family of 4.9 while the Asante Akim South has 50.4 % for males and 49.6 % for females. The ethnic distribution in Asante-Akim North includes 93.6% Akans while Ga-dangbe, Dagomba and Mole-Dagbani form the minority group in the district. The Asante Akim South District is homogeneous with the indigenous people Asante constituting 65 % while Akyems, Kwahus and Akwapims constitute 10 %, 4.7 % and 5.5 % respectively. There are yet other minority tribes such as those from the North, Ewes, gas and Krobos who constitute 14.8 per cent. This situation has fueled migration to and from the district especially the Kwahu and Akyem communities that share boundaries with the Eastern Region.

With respect to religion, in the Asante Akim North, Christians dominate with 93.5 %, Moslems 1.6 %, other religion 0.8 %, no religion 3.7 % and traditionalists 0.4% while Asante Akim South has 68.8 % Christians dominating, 15.9 % and 8.5 % practicing others such as the Islamic and traditional religions respectively. The practice of Buddhism and Hinduism form an insignificant proportion of the

population. The Asante Akim North and South districts have majority of their population living in the rural areas. Asante Akim South is estimated to have 16.5% urban and 83.5% rural population.

3.1.3 The Local Economy

In the Asante Akim North district agriculture is the predominant major occupation among people aged 15 and older, comprising 53.9% of all occupations. There are also significant numbers of people employed in trading (16.3%) and in vocational service activities (13.1%) such as hairdressing, sewing, and driving. Labour (e.g. masonry, carpentry, etc.) and professional occupations (e.g. teachers, pharmacist, etc.) each make up 6.4% and 6.5% of the workforce. The local economy of the Asante Akim South district has 68.4% of its labour force employed while 7.6% are unemployed (socio-economic Survey 1996). Of those who are employed, 45.5% are females while 54.5% are males. About 47% of the unemployed are males whilst 53% are female. About 72.4% out of the employed labour force is engaged in the agricultural sector, 21.6% in the service sector and 6% employed in the industrial sector. It is also estimated that 80% of the internally generated funds (IGFs) of the District comes from agriculture and its related activities.

3.1.4 Agriculture

In the Asante Akim North district, agriculture the major occupation forming 53.9 % of the employed population who are aged 15 and older. Agriculture is generally undertaken by small holders with about 72% of the farmers cultivating less than 3 acres of land. Large-scale farming is virtually absent as only about 6% of the farmers cultivate more than 5 acres. Access to land is limited, as the laws of Ghana do not allow freehold lease.

With Asante Akim South district, agriculture employs about 72.4 %. Of the total employed labour force in the district, 85% of farmers in the district are aged 22-64, followed by those in the 15-21 year bracket. Agriculture in the district is predominantly subsistence. However, within these two districts, tree crops are grown mainly for commercial purposes. Livestock and poultry are kept in the backyard as a supplementary source of food and income.

3.2. Cocoyam /Cocoyam Leaf Production

3.2.1 Characteristics of Farmers

Table 3.1 provides information on the socioeconomic characteristics of farmers interviewed in the district. In the Asante-Akim North district majority (80%) of the farmers interviewed were females but 66.7 % had males as heads of their household with only 33.3% as female family heads.

With Asante Akim South district, 58.3 % and 41.7% of respondents were male and female respectively. The household heads was 70.8 % and 29.2 % for males and female respectively. On the average, 81.5 % of respondents were married, 16.5 % singled and 2% widowed in the two districts.

Table 3.1a: Socio-economic Characteristics of Cocoyam/cocoyam leaf Producers

| Characteristics | Asante Akim North District (AAN) | | Asante Akim South District (AAS) | |
|---------------------------------|-------------------------------------|---------|-------------------------------------|---------|
| | Frequency | Percent | Frequency | Percent |
| Gender of household head | | | | |
| Males | 16 | 66.7 | 17 | 70.8 |
| Females | 8 | 33.3 | 7 | 29.2 |
| Gender of Respondent | | | | |
| Males | 4 | 20.0 | 14 | 58.3 |
| Females | 20 | 80.0 | 10 | 41.7 |
| Level of Education | | | | |
| No formal education | 11 | 45.8 | 7 | 29.2 |
| Primary/ JSS/Middle | 12 | 50.0 | 16 | 66.7 |
| Secondary/SSS | 1 | 4.2 | 1 | 4.1 |
| Marital Status | | | | |
| Married | 20 | 80.0 | 20 | 83.3 |
| Single | 4 | 20.0 | 3 | 12.5 |
| Widowed | | | 1 | 4.2 |
| Religion | | | | |
| Christianity | 22 | 91.6 | 20 | 83.3 |
| Islam | 1 | 4.2 | 3 | 12.5 |
| Traditionalist | 1 | 4.2 | 1 | 4.2 |
| Ethnic affiliation | | | | |
| Akan | 22 | 91.6 | 20 | 83.3 |
| Ga | 1 | 4.2 | 1 | 4.2 |
| Northerner | 1 | 4.2 | 2 | 8.3 |
| Ewe | | | 1 | 4.2 |
| Main Occupation | | | | |
| Farming | 23 | 95.8 | 23 | 95.8 |
| Trading | 1 | 4.2 | 1 | 4.2 |
| Type of producer | | | | |
| Cocoyam Cormel only | | | 3 | 12.5 |
| Cocoyam Cormel and leaf | 24 | 100 | 21 | 87.5 |
| Main Source of capital | | | | |
| Own funds | 24 | 100.0 | 24 | 100.0 |
| Banks | - | - | - | - |
| Friends/Relatives | - | - | - | - |
| Awareness of RTIMP | | | | |
| Yes | 3 | 12.5 | 4 | 16.7 |
| No | 21 | 87.5 | 20 | 83.3 |
| Beneficiary of RTIMP | | | | |
| Yes | 3 | 12.5 | 4 | 16.7 |
| No | 21 | 87.5 | 20 | 83.3 |

Source: Field Survey, 2008

Table 3.1b: Socio-economic Characteristics of Cocoyam/cocoyam leaf Producers

| Characteristic | Asante Akim North (AAN) | Asante Akim South(AAS) |
|---------------------------|-------------------------|------------------------|
| | Descriptive Statistics | Descriptive Statistics |
| Age of respondents | | |
| Minimum | 25 | 20 |
| Maximum | 85 | 76 |
| Mean | 47 | 45 |
| Std. Deviation | 13 | 14 |
| Family size | | |
| Minimum | 3 | 3 |
| Maximum | 10 | 10 |
| Mean | 5 | 5 |
| Std. Deviation | 1.8 | 1.8 |

Source: Field Survey, 2008

In terms of educational background of respondents, approximately 45.8% (Asante Akim North) and 29.2% (Asante Akim South) had had no Formal Education, 50 % (AAN) and 66.7 % (AAS) Primary/JSS/Middle and 4% had Secondary School education in the two districts. Mean age of respondents was 46years with an average family size of 5. Majority (91.6% (AAN) and 83.3% (AAS)) were Christians. The ethnic affiliation and religion for respondents in the two districts followed a similar same distribution as Akans and Christians were the majority respectively.

Farming was the main income generating activity for approximately 95.8% of respondents. All the respondents in the two districts indicated that they used their own funds to finance their farming activities. Level of awareness of RTIMP activities on cocoyam was very low. Only 12.5% (AAN) and 16.7 % (AAS) claimed to be beneficiary of RTIMP.

3.2.2 Scale of Production and yields

Majority of the farmers interviewed cultivated cocoyam for both the cormel and leaf. They could not quantify the yields for the leaves harvested though estimates of cormel yield per acre was put at 15- 35 mini-bags which weighed about 91 kg per bag. Average acreage cultivated per farmer (for both cormel and leaf) was 1 acre in the Asante Akim South while Asante Akim North recorded 0.5 acre, maximum of 5 acres and 1 acre respectively for the south and north districts.

Table 3.2: Average acreage cultivated per farmer - 2007 Cropping Season

| Crop | Asante Akim North Acreage cultivated (Acres) | Yield/Acre (kg/bag) | Asante Akim South Acreage cultivated (Acres) | Yield/Acre (kg/bag) |
|----------------------------|--|--------------------------|--|--------------------------|
| Cocoyam leaf | Sole leaf production is not practised | Difficult to quantify | Sole leaf production is not practised | Difficult to quantify |
| Cormel | 0.5 acre | 15 mini bags | 1.0 acre | 15- 35 mini bags |
| Cocoyam leaf and cormel | | | | |

NB. A mini-bag of cocoyam weighs 91kg

3.2.2 Land Acquisition and related problems

Table 3.3.1 and 3.3.2 show how farmers in the two Asante Akim districts get land for cocoyam/cocoyam leaf production and general agricultural activities. Majority of farmers in the two districts used their family lands in the production of cocoyam leaves and cormels. Renting and Share cropping of land for cocoyam production was not a common practice as seen in Table 3.3.1. Table 3.3.2 clearly shows that land acquisition was not a problem in the two districts.

Table 3.3.1: Method of land acquisition

| Acquisition method | Asante Akim North(AAN) | | Asante Akim South(AAN) | |
|--------------------|------------------------|------------|------------------------|------------|
| | Frequency | % | Frequency | % |
| Renting | 4 | 16.6 | 5 | 20.8 |
| Purchase | - | - | - | - |
| Share cropping | 4 | 16.6 | 3 | 12.5 |
| Family land | 16 | 66.8 | 15 | 62.5 |
| Others | - | - | 1 | 4.2 |
| Total | 24 | 100 | 24 | 100 |

Source: Field Survey, 2008

Table 3.3.2: Land acquisition problem

| Response | Asante Akim North(AAN) | | Asante Akim South(AAN) | |
|--------------|------------------------|------------|------------------------|------------|
| | Frequency | % | Frequency | % |
| Yes | 3 | 12.5 | 3 | 12.5 |
| No | 21 | 87.5 | 21 | 87.5 |
| Total | 24 | 100 | 24 | 100 |

Source: Field Survey, 2008.

Table 3.4 shows that land acquisition in the two districts was not too problematic. The small percentages for hire / rent and litigation are indicative of very low incidence of land associated problems.

Table 3.4: Problems associated with Land acquisition

| Problem | Asante Akim North | | Asante Akim South | |
|------------------------------|-------------------|--------------|-------------------|--------------|
| | Frequency | % | Frequency | % |
| Difficulty in obtaining land | - | - | - | - |
| Hire / rent | 2 | 8.3 | 3 | 12.5 |
| Litigation | 1 | 4.2 | 1 | 4.2 |
| Non-availability of land | - | - | - | - |
| NA | 21 | 87.5 | 20 | 83.3 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

3.2.3 Varieties grown

Generally local varieties of cocoyam were grown in the two districts for both the leaves and cormels. There were two main local varieties; red (“mankani kokoo”) and white (“mankani fitaa”) varieties. The leaf colour varies from light green to dark green. It is usually difficult to differentiate the varieties with

the leaf colour except when the below ground parts are uprooted and assessed. Also, with the much experienced farmers they are able to detect with peculiar characteristics of these local varieties. It is evident the red coloured local varieties are the most preferred for production in the districts due to its special characteristics for the various local dishes (see table 3.5b).

Table 3.5a: Cocoyam leaf varieties grown in Asante Akim North & South Districts

| Response | Asante Akim North | | Asante Akim South | |
|----------------------|-------------------|--------------|-------------------|--------------|
| | Frequency | % | Frequency | % |
| Local red coloured | 3 | 12.5 | 3 | 12.5 |
| Local white coloured | 2 | 8.3 | 3 | 12.5 |
| Both red and white | 19 | 79.2 | 18 | 75.0 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.5b: Cocoyam varieties grown for cormels in Asante Akim North & South Districts

| Response | Asante Akim North | | Asante Akim South | |
|----------------------|-------------------|--------------|-------------------|--------------|
| | Frequency | % | Frequency | % |
| Local red coloured | 21 | 87.5 | 22 | 91.7 |
| Local white coloured | 3 | 12.5 | 2 | 8.3 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.6 indicates the distribution of farmers who cultivated cocoyam before the inception of RTIMP project. The results show that over 50 % of farmers interviewed were producing cocoyam before the RTIMP project was initiated in the two districts. It also confirms that the area is a major cocoyam producing region in Ghana.

Table 3.6: Cultivation of cocoyam for leaves and cormels before RTIMP project

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|------------|
| | Frequency | % | Frequency | % |
| Yes | 13 | 54.2 | 14 | 58.3 |
| No | 11 | 45.8 | 10 | 41.7 |
| Total | 24 | 100.0 | 24 | 100 |

Source: Field Survey, 2008.

Table 3.7 indicates a comparison of qualities of cocoyam varieties such as early maturing, high yielding, and resistance to disease/pest, good pounding ability and long shelf life. Clearly, there are no marked differences in terms of superior characteristics of the varieties that RTIMP introduced into the district compared to the locally grown varieties.

Tables 3.8a and 3.8b shows that majority of cocoyam cormel / cocoyam leaf farmers were not aware of any improved cocoyam varieties that has been officially released for cormel or leaf production.

Table 3.7a: Advantages of RTIMP varieties over traditional varieties (AAN)

| Advantage | Yes | | No | |
|----------------------------|-------|---|-------|-------|
| | Freq. | % | Freq. | % |
| Early maturity | 0 | 0 | 24 | 100.0 |
| High yielding | 0 | 0 | 24 | 100.0 |
| Resistance to disease/pest | 0 | 0 | 24 | 100.0 |
| Good pounding ability | 0 | 0 | 24 | 100.0 |
| High shelf life | 0 | 0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.7b: Advantages of RTIMP varieties over traditional varieties (AAS)

| Advantage | Yes | | No | |
|----------------------------|-------|-----|-------|-------|
| | Freq. | % | Freq. | % |
| Early maturity | 0 | 0 | 24 | 100.0 |
| High yielding | 1 | 4.2 | 23 | 95.8 |
| Resistance to disease/pest | 0 | 0 | 24 | 100.0 |
| Good pounding ability | 0 | 0 | 24 | 100.0 |
| High shelf life | 0 | 0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.8a: Awareness of improved cocoyam leaf varieties

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Yes | 5 | 20.8 | 6 | 25 |
| No | 19 | 79.2 | 18 | 75 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.8b: Awareness of improved cocoyam cormel varieties

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Yes | 0 | 0 | 1 | 4.2 |
| No | 24 | 100 | 23 | 95.8 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

3.2.4 Source of planting material

Tables 3.9a and 3.9b presents the various sources of planting materials within the two districts. Over 50 % of the respondents obtained planting materials from their own farms while a little over 40% obtained planting materials from their friends/relatives. None of the farmers obtained planting materials from the Ministry of Food and Agriculture and Research Institutions.

Table 3.9a: Sources of planting materials (AAN)

| Planting material source | Yes | | No | |
|---------------------------------|-------|------|-------|-------|
| | Freq. | % | Freq. | % |
| Farmer's own output | 13 | 54.2 | 11 | 45.8 |
| Family/Friends | 10 | 41.7 | 14 | 58.3 |
| Local planting material dealers | 4 | 16.7 | 20 | 83.3 |
| MoFA | 0 | 0 | 24 | 100.0 |
| Research Institutions | 0 | 0 | 24 | 100.0 |
| Others | 0 | 0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.9b: Sources of planting materials (AAS)

| Planting material source | Yes | | No | |
|---------------------------------|-------|------|-------|------|
| | Freq. | % | Freq. | % |
| Farmer's own output | 13 | 54.2 | 11 | 45.8 |
| Family/Friends | 10 | 41.7 | 14 | 58.3 |
| Local planting material dealers | 3 | 12.5 | 21 | 87.5 |
| MoFA | 0 | 0 | 24 | 100 |
| Research Institutions | 0 | 0 | 24 | 100 |
| Others | 0 | 0 | 24 | 100 |

Source: Field Survey, 2008.

Tables 3.10a and 3.10b show that non-availability and high cost of planting materials were not major problems for a greater percentage of farmers interviewed in the two districts. About 30 – 40 % of respondents associated these problems with the acquisition of planting materials. Transportation cost though mentioned, was of little impact.

Table 3.10a: Problems faced in acquiring planting materials (AAN)

| Problem | Yes | | No | |
|---------------------|-------|------|-------|------|
| | Freq. | % | Freq. | % |
| Non-availability | 11 | 45.8 | 13 | 54.2 |
| High cost | 10 | 41.7 | 14 | 58.3 |
| Transportation cost | 3 | 12.5 | 21 | 87.5 |
| Others | 1 | 4.2 | 23 | 95.8 |

Source: Field Survey, 2008.

Table 3.10b: Problems faced in acquiring planting materials (AAS)

| Problem | Yes | | No | |
|---------------------|-------|------|-------|------|
| | Freq. | % | Freq. | % |
| Non-availability | 8 | 33.3 | 16 | 66.7 |
| High cost | 8 | 33.3 | 16 | 66.7 |
| Transportation cost | 3 | 12.5 | 21 | 87.5 |
| Others | 1 | 4.2 | 23 | 95.8 |

Source: Field Survey, 2008.

3.2.5 Cultural/Husbandry Practices in cocoyam/cocoyam leaf production

Farming system in the Asante Akim districts is usually the slash and burn which is cropped for about two to three years and the land allowed to fallow. Mixed cropping and inter cropping are the main cropping systems. Since cocoyam tolerates shade, the crop is frequently grown with permanent crops such as oil palm, and cocoa as intercrop. Cocoyam is usually intercropped with plantain in newly established farms in these two districts.

Tables 3.11a and 3.11b reveals the cropping system adopted by farmers in the Asante Akim North and South districts. Characteristically, mixed cropping is the predominant practice while mono-cropping is not practised by farmers involved in the production of cocoyam.

Table 3.11a: Cropping system adopted by farmers (AAN)

| Cropping system | Freq. | % |
|----------------------|----------|----------|
| Mixed cropping | 23 | 95.8 |
| Shifting cultivation | 1 | 4.2 |
| Mono-cropping | - | - |
| Total | - | - |

Source: Field Survey, 2008

Table 3.11b: Cropping system adopted by farmers (AAS)

| Cropping system | Freq. | % |
|----------------------|-----------|--------------|
| Mixed cropping | 23 | 95.8 |
| Shifting cultivation | 1 | 4.2 |
| Mono-cropping | - | - |
| Total | 24 | 100.0 |

Source: Field Survey, 2008

Table 3.12a and 3.12b shows that 80– 90% of farmers interviewed planted anyhow with the rest planting in rows. This affects the plant density per unit area and ultimately the output in terms of cormel and leaf yields of cocoyam. Fertilization of cocoyam farms is not a usual practice but some farmers are aware that the use of organic manure is recommended. Pest and disease control for cocoyam farmers is not a usual practice as knowledge on these is either absent or poor.

Table 3.12a: Land preparation & Planting method adopted and other Husbandry Practices (AAN)

| Land preparation & Planting methods adopted | | |
|---|-------|-------|
| Land preparation & planting method | Freq. | % |
| Slash & burn | 21 | 87.5 |
| Others | 3 | 12.5 |
| Row/line planting | 3 | 12.5 |
| Planting anyhow | 21 | 87.5 |
| Total | | |
| Other husbandry practices | | |
| Husbandry practice | Freq. | % |
| Weeding | 24 | 100.0 |
| Fertilizer/manure application | 0 | 0.0 |
| Pest /disease control | 0 | 0.0 |

Source: Field Survey, 2008

Table 3.12b: Land preparation & Planting method adopted and other Husbandry Practices (AAS)

| Planting methods adopted | | |
|------------------------------------|-------|-------|
| Land preparation & planting method | Freq. | % |
| Slash & burn | 22 | 91.7 |
| Others | 2 | 8.3 |
| Row/line planting | 2 | 8.3 |
| Planting anyhow | 22 | 91.7 |
| Total | | |
| Other husbandry practices | | |
| Husbandry practice | Freq. | % |
| Weeding | 24 | 100.0 |
| Fertilizer/manure application | 0 | 0.0 |
| Pest /disease control | 0 | 0.0 |

Source: Field Survey, 2008

The use of agrochemicals in cocoyam farming among farmers interviewed was limited. About 20 - 29 % of farmers interviewed had no idea of any improved method for pest/disease control measures in cocoyam production as shown in Table 3.13.

However, 75% of respondents had agro-chemical shops in their farming communities (refer to Table 3.14a). Typical of rural farmers, these chemicals are perceived to be expensive and therefore prohibit them from applying them notwithstanding the immense benefits that can be derived when properly used.

Table 3.13: Main reason for not using any improved pest/disease control measures

| Reason | AAN | | AAS | |
|------------------------------|-----------|------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Not aware of improved method | 5 | 20.8 | 7 | 29.1 |
| Expensive/high cost | 16 | 66.7 | 16 | 66.7 |
| Time-consuming | - | - | - | - |
| Others | 3 | 12.5 | 1 | 4.2 |
| Total | 24 | 100 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.14a: Presence of agro-chemical shops in community

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Yes | 18 | 75.0 | 18 | 75.0 |
| No | 6 | 25.0 | 6 | 25.0 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

The poor patronage for agro-chemicals by cocoyam farmers affirms the observed trends in the two districts with regards to the problems of side effects of these chemical compounds. Less than 10% of respondents indicated their experience of any side effects from the use of agro-chemicals.

Table 3.14b: Problem of side effects from the usage of agro-chemicals

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Yes | 2 | 8.3 | 2 | 8.3 |
| No | 22 | 91.6 | 22 | 91.6 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

3.2.6. Labour use

Table 3.15 shows type of labour used by farmers interviewed for the various farming activities. Land clearing was mostly done with hired labour due to its laborious nature compared with the other cultural practices. Planting, weeding and harvesting were done with both family and hired labour.

Table 3.15: Labour use by farmers interviewed

| Activity | AAN | AAS |
|---------------|------------------|------------------|
| | Type Of Labour | Type Of Labour |
| Land Clearing | Mostly Hired | Mostly Hired |
| Planting | Family and Hired | Family and Hired |
| Weeding | Family and Hired | Family and Hired |
| Harvesting | Family and Hired | Family and Hired |

Source: Field Survey, 2008

3.3. Harvesting of Cocoyam Leaf

Generally cocoyam is cultivated purposely for cormels. Harvesting of leaves is cautiously or selectively started after six months after planting when cormels begin to form up to a year or beyond depending upon the prevalence of optimum growing conditions. Harvesting is usually staggered so as to get fresh and tender leaves weekly. Most farmers indicated that harvesting of leaves has a limit beyond which the final yield of cormels tends to be affected negatively. It is therefore the usually practice of picking leaves when plants are beyond 12 months in age or from regenerated plants of old and or abandoned farms. Some leaves are picked from the wild.

3.3.1 Mode of harvesting

Harvesting of cocoyam in the surveyed districts is done by hand with knife, without a knife or both. As shown in Table 3.16, majority harvested cocoyam leaves by hand without a knife. This was deemed to be very effective if one wants to be very smart in this activity.

Table 3.16: Mode of harvesting of cocoyam leaves

| Response | AAN | | AAS | |
|-------------------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| By hand without a knife | 21 | 87.5 | 18 | 75.0 |
| By hand with a knife | 3 | 12.5 | 5 | 20.8 |
| Mixed | - | - | 1 | 4.2 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

3.3.2. Gender group involved

Table 3.17 shows the distribution among gender group involved in harvesting cocoyam leaves. Cocoyam leaves harvesting in the two districts is done by both males and females though females predominate in Asante Akim South.

Table 3.17: Gender group involved in cocoyam leaves harvesting

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Male | - | - | - | - |
| Females | 11 | 45.8 | 12 | 50.0 |
| Both | 13 | 54.2 | 10 | 41.7 |
| No response | - | - | 2 | 8.3 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

3.3.3 Maturity of harvestable cocoyam leaf

Table 3.18 shows the maturity of harvestable cocoyam leaf or how long it takes cocoyam to be ready for its leaves to be harvested. Generally, cocoyam leaf is usually harvested when the cormels are matured. Majority of farmers harvested cocoyam leaf from the plant 12 months after planting.

Table 3.18: Maturity of harvestable cocoyam leaf

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| 3 months | 1 | 4.2 | - | - |
| 6 months | 5 | 20.8 | 4 | 16.7 |
| 12 months | 18 | 75 | 20 | 83.3 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

3.3.4 Desirable qualities of harvestable cocoyam leaf

Table 3.19a and 3.19b presents the desirable qualities used in selecting a potential leaf to be harvested by farmers within the two districts. These include tenderness (texture of leaf), freshness, shape / size, disease free and greenish colour of leaves as well as the maturity of cormels. The most preferred qualities considered in selecting a harvestable leaf is the freshness and disease free status. The tenderness and green colour compliments these two major qualities for a final selection.

Table 3.19a: Desirable qualities used in the selection of harvestable cocoyam leaf (AAN)

| Desirable quality | Yes | | No | |
|---------------------------------|-------|------|-------|------|
| | Freq. | % | Freq. | % |
| Long size | 1 | 4.2 | 23 | 95.8 |
| Tender/soft leaves/young leaves | 3 | 12.5 | 21 | 87.5 |
| When cormels are matured | 2 | 8.3 | 22 | 91.7 |
| Green Colour | 4 | 16.7 | 20 | 83.3 |
| Fresh leaves | 19 | 79.2 | 5 | 20.8 |
| Normal shape | - | - | 24 | 100 |
| Disease free | 17 | 70.8 | 7 | 29.2 |

Source: Field Survey, 2008.

Table 3.19b: Desirable qualities used in the selection of harvestable cocoyam leaf (AAS)

| Desirable quality | Yes | | No | |
|---------------------------------|-------|------|-------|-------|
| | Freq. | % | Freq. | % |
| Long size | 1 | 4.2 | 23 | 95.8 |
| Tender/soft leaves/young leaves | 4 | 16.7 | 20 | 83.3 |
| When cormels are matured | 2 | 8.3 | 22 | 91.7 |
| Green Colour | 3 | 12.5 | 21 | 87.5 |
| Fresh leaves | 18 | 75 | 6 | 25.0 |
| Normal shape | - | 0.0 | 24 | 100.0 |
| Disease free | 16 | 67.7 | 8 | 33.3 |

Source: Field Survey, 2008.

3.3.5. Factors limiting the availability of harvestable cocoyam leaf

Tables 3.20a and 3.20b presents factors limiting the availability of harvestable cocoyam leaves. The key limiting factor is the dry season though inadequate rainfall and wildfires are also accountable for unavailability of cocoyam leaves in the farming communities.

Table 3.20a: Factors limiting the availability of harvestable cocoyam leaves (AAN)

| Limiting factor | Yes | | No | |
|---------------------|-------|------|-------|-------|
| | Freq. | % | Freq. | % |
| Dry season | 24 | 100 | - | - |
| Inadequate rainfall | 2 | 8.3 | 22 | 91.7 |
| Pests and diseases | - | - | 24 | 100.0 |
| Wildfires | 4 | 16.7 | 20 | 83.3 |

Source: Field Survey, 2008.

Table 3.20b: Factors limiting the availability of harvestable cocoyam leaves (AAS)

| Limiting factor | Yes | | No | |
|---------------------|-------|------|-------|------|
| | Freq. | % | Freq. | % |
| Dry season | 22 | 91.7 | 2 | 8.3 |
| Inadequate rainfall | 2 | 8.3 | 22 | 91.7 |
| Pests and diseases | 2 | 8.3 | 22 | 91.7 |
| Wildfires | 3 | 12.5 | 21 | 87.5 |

Source: Field Survey, 2008.

3.3.6. Factors causing deterioration of cocoyam leaves before harvesting

The deterioration of cocoyam leaves before harvesting is attributed to factors such as inadequate rainfall, dry season, wildfires, pests and diseases in decreasing order of importance. The respondents in the two districts indicated the dry spells during droughts is a major determinant for the deterioration of cocoyam leaves (refer to Tables 3.21a and 3.21b).

Table 3.21a: Factors causing the deterioration of cocoyam leaves before its harvesting (AAN)

| Limiting factor | Yes | | No | |
|---------------------|-------|-------|-------|-------|
| | Freq. | % | Freq. | % |
| Dry season | 24 | 100.0 | - | - |
| Inadequate rainfall | - | - | 24 | 100.0 |
| Wildfires | 3 | | 21 | |
| Pests and Diseases | - | - | 24 | 100.0 |
| Leaf colouring | - | - | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.21b: Factors causing the deterioration of cocoyam leaves before its harvesting (AAS)

| Limiting factor | Yes | | No | |
|---------------------|-------|------|-------|-------|
| | Freq. | % | Freq. | % |
| Dry season | 22 | 91.7 | 2 | 8.3 |
| Inadequate rainfall | - | - | 24 | 100.0 |
| Wildfires | 2 | 8.3 | 22 | 91.7 |
| Pests and Diseases | 1 | 4.2 | 23 | 95.8 |
| Leaf colouring | - | - | 24 | 100.0 |

Source: Field Survey, 2008

3.3.7 Problems associated with harvesting of cocoyam leaves

Problems faced by farmers during harvesting of cocoyam leaves include itching of hands and stains from its latex (see Tables 3.22a and 3.22b). Farmers in these districts did not find this activity to result in waist problems nor impose any drudgery on them.

Table 3.22a: Problems faced in the harvesting of cocoyam leaves (AAN)

| Problem | Yes | | No | |
|------------------|-------|------|-------|-------|
| | Freq. | % | Freq. | % |
| Itching of hands | 19 | 79.2 | 5 | 20.8 |
| stains | 19 | 79.2 | 5 | 20.8 |
| drudgery | - | - | 24 | 100.0 |
| Waist pains | - | - | 24 | 100.0 |
| Other(s) | 3 | 12.5 | 21 | 87.5 |

Source: Field Survey, 2008.

Table 3.22b: Problems faced in the harvesting of cocoyam leaves (AAS)

| Problem | Yes | | No | |
|------------------|-------|------|-------|-------|
| | Freq. | % | Freq. | % |
| Itching of hands | 18 | 75 | 6 | 25.0 |
| stains | 17 | 70.8 | 7 | 29.2 |
| drudgery | - | - | 24 | 100.0 |
| Waist pains | - | - | 24 | 100.0 |
| Other(s) | 2 | 8.3 | 22 | 100.0 |

Source: Field Survey, 2008.

3.4 Post harvest handling, preservation and packaging

3.4.1 Handling/preparation of cocoyam leaf after harvesting

Table 3.23a and 3.2b shows preparation and packaging methods at the farmer level after harvesting cocoyam leaves. Generally farmers just select the marketable leaves based on the desirable qualities already discussed and tie in bundles. There is virtually no processing of cocoyam leaves at the farmer level before marketing except for sorting and sometimes cleaning.

Table 3.23a: Handling/preparation of cocoyam leaf - the farmer level (AAN)

| Response | Freq. | % |
|----------------------------------|-----------|--------------|
| Select, clean and tie in bundles | - | - |
| Select and tie in bundles | 7 | 29.2 |
| Others | 3 | 12.5 |
| No response | 14 | 58.3 |
| Total | 24 | 100.0 |

Source: Field Survey, 2008

Table 3.23b: Handling/preparation of cocoyam leaf - the farmer level (AAS)

| Response | Freq. | % |
|----------------------------------|-----------|--------------|
| Select, clean and tie in bundles | 1 | 4.2 |
| Select and tie in bundles | 6 | 25.0 |
| Others | 3 | 12.5 |
| No response | 14 | 58.3 |
| Total | 24 | 100.0 |

Source: Field Survey, 2008

3.4.2 Preservation Methods at the farmer level

Preservation of cocoyam leaves at the farmer level is done by either keeping in an airy place or leaving in the open overnight and exposing them to early morning dew. Excessive heat was the main factor causing deterioration of harvested cocoyam leaves at the farmer level.

Table 3.24: Methods used in preserving cocoyam leaves

| Response | AAN | | AAS | |
|----------------------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Keep in airy place | 7 | 29.2 | 5 | 20.8 |
| Left in the open overnight | 8 | 33.3 | 8 | 33.3 |
| Others | 8 | 33.3 | 6 | 25.0 |
| No response | 1 | 4.2 | 5 | 20.8 |
| Total | 24 | 100.0 | 24 | 100.0 |

Usually cocoyam leaves stay fresh up 3 days after harvesting at the farmer level depending on the prevailing ambient weather conditions and the method of storage. Beyond this period farmers are discouraged from selling due to the discolouration from green to light yellow and green mix as a result of exposure to heat and light. The freshness and tenderness is lost and the appeal to potential buyers is lost (see table 3.25a and 3.25b).

Table 3.25a: How long does cocoyam leaf stay to maintain its consumer desirable qualities (AAN)

| Response | Freq. | % |
|--------------|-----------|--------------|
| One day | 1 | 4.2 |
| Two days | 3 | 12.5 |
| Three days | 16 | 66.7 |
| Four days | 4 | 16.6 |
| One week | - | - |
| Total | 24 | 100.0 |

Source: Field Survey, 2008

Table 3.25b: How long does cocoyam leaves stay to maintain its consumer desirable qualities (AAS)

| Response | Freq. | % |
|--------------|-----------|--------------|
| One day | 1 | 4.2 |
| Two days | 2 | 8.3 |
| Three days | 16 | 66.6 |
| Four days | 3 | 12.5 |
| One week | 1 | 4.2 |
| No response | 1 | 4.2 |
| Total | 24 | 100.0 |

Source: Field Survey, 2008

Excessive heat is mentioned by most respondents as the critical factor for leaves deterioration (see table 3.26).

Table 3.26: Factors causing deterioration of harvested cocoyam leaves in the area

| Response | AAN | | AAS | |
|----------------|-----------|--------------|-----------|--------------|
| | Frequency | % | Frequency | % |
| Excessive heat | 21 | 87.5 | 19 | 79.2 |
| Pests | - | - | 1 | 4.2 |
| Others | 3 | 12.5 | 2 | 8.3 |
| No response | - | - | 2 | 8.3 |
| Total | 24 | 100.0 | 24 | 100.0 |

3.4.3. Packaging of cocoyam leaf and sale of leaves and cormels

Table 3.27 presents packaging methods used by the farmers in the two districts. After selection, the leaves are tied in bundles by farmers and either packed into baskets or jute sacks. The farmers in these localities do not pack cocoyam leaves in polythene bags since the free circulation of air to minimize the negative effect of ambient heat was limited within these materials.

Table 3.27: Packaging of cocoyam leaves from the farm-gate to the market

| Response | AAN | | AAS | |
|--------------------------|-----------|------------|-----------|------------|
| | Freq. | % | Freq. | % |
| Carried in baskets | - | - | 1 | 4.2 |
| Packed in jute sacks | 7 | 29.2 | 7 | 29.2 |
| Packed in polythene bags | - | - | - | - |
| Others | 3 | 12.5 | 2 | 8.3 |
| No response | 14 | 58.3 | 14 | 58.3 |
| Total | 24 | 100 | 24 | 100 |

Source: Field Survey, 2008

The sale of cocoyam leaves in the districts is carefully planned after harvesting though some farmers did sell immediately after harvest. The immediate sale is possibly linked to the economic circumstances the farmer might find him or herself. Majority (66.7 %) of farmers in the two districts do not sell their cocoyam leaves and cormels immediately after harvesting as indicated in Tables 3.28a and 3.28b respectively.

Table 3.28a: Sale of cocoyam leaves immediately after harvest?

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Freq. | % | Freq. | % |
| Yes | 8 | 33.3 | 8 | 33.3 |
| No | 16 | 66.7 | 16 | 66.7 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.28b: Sale of cocoyam cormels immediately after harvest?

| Response | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Freq. | % | Freq. | % |
| Yes | 7 | 29.2 | 9 | 37.5 |
| No | 17 | 70.8 | 15 | 62.5 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

The sale points of produce from the districts were outside the district market and predominantly (ie. 50- 62.5 %) at other points such as chop bars, restaurants and roadsides.

Table 3.29a: Produce sale points (AAN)

| Sale point | Freq. | % |
|-------------------------------|-----------|--------------|
| Farm gate | 1 | 4.2 |
| Main district market | 1 | 4.2 |
| Other markets in the district | 1 | 4.2 |
| Market outside the district | 5 | 20.7 |
| Itinerant trader | 1 | 4.2 |
| Other | 15 | 62.5 |
| Total | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.29b: Produce sale points (AAS)

| Sale point | Freq. | % |
|-------------------------------|-----------|--------------|
| Farm gate | 1 | 4.2 |
| Main district market | 4 | 16.6 |
| Other markets in the district | 1 | 4.2 |
| Market outside the district | 5 | 20.8 |
| Itinerant trader | 1 | 4.2 |
| Other | 12 | 50.0 |
| Total | 24 | 100.0 |

Source: Field Survey, 2008.

Table 3.27 shows the activities preceding the sale of harvested leaves in the market. The leaves are not processed in any way except being sorted to facilitate packaging. The two districts show similar results as majority of producers do not process the leaves prior to their sale in the market.

Table 3.27: Processing of harvested leaves before marketing

| Response | AAN | | AAS | |
|----------------------|-----------|------------|-----------|------------|
| | Freq. | % | Freq. | % |
| Sorting only | 9 | 37.5 | 9 | 37.5 |
| Sorting and cleaning | - | - | - | - |
| No processing | 14 | 58.3 | 15 | 62.5 |
| Others | 1 | - | - | - |
| No response | - | - | - | - |
| Total | 24 | 100 | 24 | 100 |

Source: Field Survey, 2008

3.5 Constraints faced by cocoyam cormel /cocoyam leaf farmers

Constraints faced by cocoyam/cocoyam leaf farmers interviewed are bulleted below:

- Land acquisition
- Cost of planting material
- High cost of transportation
- Lack of knowledge on improved varieties
- Lack/ limited access to credit
- Soil borne diseases such as stunted growth

3.6 Costing of cocoyam/cocoyam leaf Production

Table 3.30a: Variable Cost per acre of cocoyam/cocoyam leaf production (AAN)

| VARIABLE COST PER ACRE OF COCOYAM / COCOYAM LEAF | | | |
|--|---------------------------|------------------------|--------------|
| Item | No of Man days / quantity | Cost per Man day (GHC) | Amount (GHC) |
| Land preparation | 8 | 3.0 | 24.0 |
| Planting materials | - | - | 20 |
| Planting | 4 | 3.0 | 12 |
| Weeding (3x) | 24 | 3.0 | 72 |
| Fertilizer/Agrochemicals | - | - | - |
| Fertilizer Application | - | - | - |
| Harvesting | 8 | 3.0 | 24 |
| Haulage/Transportation | 16 | 3.0 | 48 |
| Total | 44 | - | 170.0 |

Source: Field Survey, 2008

Table 3.30b: Variable Cost per acre of cocoyam/cocoyam leaf production (AAS)

| VARIABLE COST PER ACRE OF COCOYAM / COCOYAM LEAF | | | |
|--|---------------------------|------------------------|--------------|
| Item | No of Man days / quantity | Cost per Man day (GHC) | Amount (GHC) |
| Land preparation | 10 | 3.5 | 35.0 |
| Seed/Suckers | 200 | 0.1 | 20 |
| Planting (by women) | 5 | 3.0 | 15 |
| Weeding (3x) | 24 | 3.5 | 84 |
| Fertilizer/Agrochemicals | - | - | - |
| Fertilizer Application | - | - | - |
| Harvesting | 15 | 3.5 | 52.5 |
| Haulage/Transportation | 20 | 3.0 | 60.0 |
| Total | | - | 242.5 |

Source: Field Survey, 2008

Table 3.31a: Fixed Cost per acre of cocoyam/cocoyam leaf production (AAN)

| FIXED COSTS | Quantity | Unit Cost(GH¢) | AMOUNT (GH¢) | Useful Life(years) | Amount per year(GH¢) |
|-------------------------|-----------------|-----------------------|---------------------|---------------------------|-----------------------------|
| i. Land | - | - | - | - | 30 |
| ii. Cutlass | 2 | 4 | 8 | 1 | 8 |
| iii. Hoes | 2 | 4 | 8 | 1 | 8 |
| iv. Baskets | 3 | 3 | 9 | 1 | 9 |
| v. Other materials | - | - | - | - | 3 |
| TOTAL FIXED COST | | | | | 58 |

Source: Field Survey, 2008

Table 3.31b: Fixed Cost per acre of cocoyam/cocoyam leaf production (AAS)

| FIXED COSTS | Quantity | Unit Cost(GH¢) | AMOUNT (GH¢) | Useful Life(years) | Amount per year(GH¢) |
|-------------------------|-----------------|-----------------------|---------------------|---------------------------|-----------------------------|
| i. Land | - | - | - | - | 30 |
| ii. Cutlass | 2 | 4 | 8 | 1 | 8 |
| iii. Hoes | 2 | 4 | 8 | 1 | 8 |
| iv. Baskets | 3 | 3 | 9 | 1 | 9 |
| v. Other materials | - | - | - | - | 3 |
| TOTAL FIXED COST | | | | | 58 |

Source: Field Survey, 2008

Table 3.32a: Net Revenue per acre of cocoyam/cocoyam leaf production (AAN)

| Item | Cocoyam Cormels | Cocoyam Leaf |
|----------------------|------------------------|---------------------|
| Yield per acre (kg) | 1820 (20 mini bags) | Difficult to state |
| Yield per acre (Mt) | 1.820 | |
| Selling price per Mt | 300 | |
| Total revenue | 300 | |
| Total Cost | 228 | |
| Net Revenue | 72.0 | |

NB. A mini-bag of cocoyam weighs 91kg

Table 3.32b: Net Revenue per acre of cocoyam/cocoyam leaf production (AAS)

| Item | Cocoyam Cormels | Cocoyam Leaf |
|----------------------|------------------------|---------------------|
| Yield per acre (kg) | 2275 (25 mini bags) | Difficult to state |
| Yield per acre (Mt) | 2.275 | |
| Selling price per Mt | 375 | |
| Total revenue | 375 | |
| Total Cost | 300.5 | |
| Net Revenue | 74.5 | |

NB. A mini-bag of cocoyam weighs 91kg

3.6 Extension Services

Table 3.33 shows that farmers were visited at least once up to five times last year by Agric Extension Agents. Only 1 % indicated that they were visited more than five times. It is worth mentioning that the extension agents in these two districts were quite active.

Table 3.33: Frequency of extension visits last year

| Frequency of visits | AAN | | AAS | |
|---------------------|-----------|--------------|----------------|--------------|
| | Freq. | % | Freq. | % |
| None | - | - | - | - |
| Once | 12 | 50.0 | 10 | 41.6 |
| 2-5 times | 12 | 50.0 | 13 | 54.2 |
| 6-10 times | - | - | 1 | 4.2 |
| >10 times | - | - | - | - |
| Total | 24 | 100.0 | 2100.04 | 100.0 |

Source: Field Survey, 2008.

It is evident from Table 3.34 that cocoyam farmers were generally satisfied with the quality of extension services offered to them by the Ministry of Food and Agriculture (MoFA). All farmers in the Asante Akim North found the visits useful while in the Asante Akim South, 83.3% and 16.7% rated the visits useful and very useful respectively.

Table 3.34: Rating of the usefulness of extension visits

| Rating | AAN | | AAS | |
|--------------|-----------|--------------|-----------|--------------|
| | Freq. | % | Freq. | % |
| Not useful | - | - | - | - |
| Useful | 24 | 100.0 | 20 | 83.3 |
| Very useful | - | - | 4 | 16.7 |
| Total | 24 | 100.0 | 24 | 100.0 |

Source: Field Survey, 2008.

4.0 SURVEY FINDINGS (TRADERS)

4.1 Socio-economic Characteristics of Traders

Tables 4.1a and 4.1b provides information on the socio-economic characteristics of cocoyam leaf traders interviewed in the Asante Akim North and South districts.

Table 4.1a: Socio-economic Characteristics of Cocoyam leaf Traders in Asante Akim Districts

| Characteristics | Frequency | Percent |
|-------------------------------|-----------|---------|
| Gender | | |
| Female | 24 | 96.0 |
| Male | 1 | 4.0 |
| Level of Education | | |
| No formal education | 8 | 33.3 |
| Primary/ JSS/Middle | 16 | 67.7 |
| Secondary/SSS | - | - |
| | - | - |
| Marital Status | | |
| Married | 20 | 80.0 |
| Single | 3 | 12.0 |
| Divorced | - | - |
| Widowed | 2 | 8.0 |
| Main Occupation | | |
| Trading | 16 | 64 |
| Farming | 8 | 32 |
| Fixed Salary based job | - | - |
| No response | 1 | 4 |
| Secondary Occupation | | |
| Trading | 5 | 20.0 |
| Farming | 7 | 28.0 |
| None | 13 | 52.0 |
| Type of trader | | |
| Wholesaler | 1 | 4.0 |
| Retailer | 15 | 60.0 |
| Wholesaler/Retailer | 8 | 32.0 |
| Commission agent | 1 | 4.0 |
| Main Source of capital | | |
| Own funds | 25 | 100.0 |
| Banks | - | - |
| Friends/Relatives | - | - |

Source: Field Survey, 2008

Table 4.1b: Socio-economic Characteristics of Cocoyam/cocoyam leaf Traders

| Characteristic | Descriptive Statistics |
|---|------------------------|
| Age of respondents | |
| Minimum | 0.0 |
| Maximum | 68.0 |
| Mean | 39.1 |
| Std. Deviation | 14.3 |
| Family size | |
| Minimum | 0.0 |
| Maximum | 13.0 |
| Mean | 4.6 |
| Std. Deviation | 3.1 |
| Years of trading in cocoyam leaves | |
| Minimum | 0.0 |
| Maximum | 37.0 |
| Mean | 5.9 |
| Std. Deviation | 6.9 |

Source: Field Survey, 2008

4.2 Major Sources of Supply and Demand

4.2.1 Main Source of Produce Supply

Table 4.2 presents information on the source of produce supply for traders interviewed. From the table, majority of traders (85%) obtain their stock (produce) from their own farms. About 12% and 44% also sourced produce from other farmers and pickers respectively. The primary source of produce was from Own farms, Pickers and Other farms.

Table 4.2: Main source of produce supply for wholesaler or itinerant trader

| Response | Freq. (Yes) | % |
|------------------|-------------|------|
| Own Farm | 11 | 44.0 |
| Other Farms | 3.0 | 12.0 |
| Pickers/ traders | 11 | 44.0 |

Source: Field Survey, 2008

The point of sale of harvested cocoyam leaves is predominantly done along the roadside since it is a highway and the heavy human traffic on it presents a wide range of potential buyers. Within and outside the district, there are markets which serve as good points of sale for cocoyam leaves especially during market days. Some of the community markets are located at Konongo, Odumasi, Agogo, Obogu, Adomfe, Ofoase, Kyempo and Kurofa. The market days are usually “taboo days” which keep inhabitant at home to engage in other activities apart from working on farms in the bush (see Table 4.3).

Table 4.3: Main sale point of produce

| Response | Freq. (Yes) | % |
|--------------|-------------|--------------|
| Roadside | 16 | 64 |
| Market | 8 | 32 |
| No response | 1 | 4 |
| Total | 25 | 100.0 |

Source: Field Survey, 2008

4.2.2 Marketing Channel for cocoyam leaf in Community

Table 4.3 presents information on the marketing channels for cocoyam leaf in the district/community. Farmers mainly sell their produce to final consumers though there is a high proportion of retailers who buy the farmers harvest before the final consumer purchases the leaves from the retailers.

Table 4.3a: Marketing channels for cocoyam leaf at the trader level

| Response | Freq (Yes). | % |
|--|-------------|------|
| Farmer – final consumer | 20 | 80.0 |
| Farmer - retailer- final consumer | 19 | 76.0 |
| Farmer - itinerant trader- retailer – final consumer | 10 | 40.0 |
| Farmer – commission agent-itinerant trader- retailer- final consumer | 4 | 16.0 |

Source: Field Survey, 2008

4.2.3 Consumer preference

Table 4.4 shows the preferences for cocoyam leaf at the trader level. Freshness, colour and tenderness of cocoyam leaf were the most important attributes of prime concern to consumers. Other desirable qualities may include disease free, cleanliness and presentation/packaging especially in the open markets. The results indicate that these qualities of cocoyam leaves cannot be taken for granted if indeed one wants to make very good business.

Table 4.4: Consumer Preference for cocoyam leaf

| Preference | % Response | | | Ranking | |
|------------|------------|-----|----------|---------|---------|
| | Yes | No | No Resp. | Rank | % Resp. |
| Freshness | 96.0 | - | 4.0 | 1 | 46.0 |
| Colour | 80.0 | 4.0 | 16.0 | 2 | 20.0 |
| Tenderness | 76.0 | 4.0 | 20.0 | 3 | 24.0 |

Source: Field Survey, 2008

4.2.4 Packaging and Preservation

Table 4.5 presents methods of preparation and packaging of cocoyam leaves for sale. The usual practice by farmers is to pack bundles of cocoyam leaves in jute sacks, fertilizer sacks or baskets. Traders select, clean and tie in bundles (64.0%) or just select and tie in bundles without cleaning (32.0%). Preservation of cocoyam leaves is done by either keeping in an airy place (96.0 %) or leave in the open overnight (4.0 %).

Excessive heat was identified as the main factor which causes deterioration of cocoyam leaves at the trader level.

Table 4.5a: Preparation and Packaging of cocoyam leaf at the trader level

| Response | Freq. | % |
|----------------------------------|-----------|--------------|
| Select, clean and tie in bundles | 16 | 64.0 |
| Select and tie in bundles | 8 | 32.0 |
| Others | - | - |
| No response | 1 | 4.0 |
| Total | 25 | 100.0 |

Source: Field Survey, 2008

Table 4.5b: Methods used in preserving cocoyam leaves

| Response | Frequency | % |
|----------------------------|-----------|--------------|
| Keep in airy place | 24 | 96.0 |
| Left in the open overnight | 1 | 4.0 |
| Total | 25 | 100.0 |

Source: Field Survey, 2008

4.3 Seasonality of Demand/Supply and Price Trends

Demand and supply of cocoyam leaf is highly seasonal. High supply is characterised by low prices. This happens from the months of April to June and September/October. The periods of dry spells, December to March/April depending on the rainfall pattern in a particular year, results in low supplies leading to high prices for both the leaves and cornels of cocoyam.

Table 4.6a: Seasonality in Pricing of cocoyam leaf

| Seasonality | Purchasing Price (Mean) | Selling price (Mean) | Difference |
|----------------------|-------------------------|----------------------|------------|
| Highest price/bundle | 0.1744 | 0.6514 | 0.4770 |
| Lowest price/bundle | 0.1420 | 0.3100 | 0.1680 |
| Highest price/basket | 0.7620 | 1.0300 | 0.2680 |
| Lowest price/basket | 0.6000 | 0.7960 | 0.1960 |

Source: Field Survey, 2008

Determination of Selling Price of Produce

Table 4.7 presents information on how the selling price of produce is determined by the prevailing current market pricing. Hence majority of traders fix / determine the price of their produce based on the supply and demand dynamics at the market. A trader's ability to negotiate with buyer also affects the pricing of the cocoyam leaves. However, the cooperative groups for traders have a little influence in regulating the prices on the market.

Table 4.7: How selling price is determined

| Response | Resp. | % Yes | Resp. | % No |
|-----------------------------------|-------|-------|-------|------|
| Negotiate price with buyer | 14 | 56.0 | 11 | 44.0 |
| A certain mark-up on buying price | 14 | 56.0 | 11 | 44.0 |
| Take current market price | 21 | 84.0 | 4 | 16.0 |

Source: Field Survey, 2008

Table 4.7b: Rankings of selling price determinants

| Response | Ranking | Freq | % |
|-----------------------------------|---------|------|------|
| Negotiate price with buyer | 1 | 7 | 28.0 |
| | 2 | 1 | 4.0 |
| | 3 | 7 | 28.0 |
| | 4 | - | - |
| | 5 | - | - |
| No Response | | 12 | 60.0 |
| A certain mark-up on buying price | 1 | 1 | 4.0 |
| | 2 | 5 | 20.0 |
| | 3 | 1 | 4.0 |
| | 4 | - | - |
| | 5 | - | - |
| No Response | | 17 | 68.0 |
| Take current market price | 1 | 5 | 20.0 |
| | 2 | 2 | 8.0 |
| | 3 | - | - |
| | 4 | - | - |
| | 5 | - | - |
| No Response | | 17 | 68.0 |

Source: Field Survey, 2008

4.4 Mode of Transportation

The transportation of cocoyam produce from farm gate to assembly point within these districts is usually by head loads. The lightness in terms of weight of the leaves compared with the cormels makes it easier for farmers and traders to cart the produce by this means.

Table 4.8: Mode of transportation - Farm-gate to assembly point

| Mode | Freq. | % |
|--------------|-----------|--------------|
| Head load | 20 | 80.0 |
| Vehicle | - | - |
| No response | 5 | 20.0 |
| Total | 25 | 100.0 |

Source: Field Survey, 2008

Table 4.9: Mode of transportation - Assembly point to local market

| Mode | Freq. | % |
|--------------|-----------|--------------|
| Head load | 15 | 60.0 |
| Vehicle | 3 | 12.0 |
| No Response | 7 | 28.0 |
| Total | 25 | 100.0 |

Source: Field Survey, 2008

Table 4.10: Mode of transportation - Local market to urban/sub urban market

| Mode | Freq. | % |
|--------------|-----------|--------------|
| Head load | 16 | 64.0 |
| Other | 1 | 4.0 |
| No response | 8 | 32.0 |
| Total | 25 | 100.0 |

Source: Field Survey, 2008

Table 4.11 Transaction cost:

| Item | Cost/unit volume | | | |
|----------------|------------------|---------|--------|----------------|
| | Minimum | Maximum | Mean | Std. Deviation |
| Transportation | 0.00 | 2.0 | 0.5100 | 0.4705 |
| Storage | 0.00 | 1.0 | 0.0600 | 0.2399 |
| Taxation | 0.00 | 1.0 | 0.1260 | 0.2284 |
| Packaging | 0.00 | 1.0 | 0.1080 | 0.2324 |
| Total | | | | |

Source: Field Survey, 2008

4.5 Major Challenges Faced in Marketing of cocoyam leaf

Table 4.12a presents information on the major challenges in marketing cocoyam leaf at the trader level. Risk of quality deterioration, risk of price changes, limited supply, low patronage and transportation difficulties were some of the challenges mentioned in decreasing order of importance. The issue of limited supply/ low patronage was seasonal.

Table 4.12a: Major Challenges facing cocoyam leaf traders

| Constraint | Response | Freq. | % |
|-----------------------------------|--------------|-----------|--------------|
| Limited Supply | Yes | 10 | 40.0 |
| | No | 15 | 60.0 |
| | No Response | - | - |
| | Total | 25 | 100.0 |
| Risk of quality deterioration | Yes | 14 | 56.0 |
| | No | 10 | 40.0 |
| | No Response | 1 | 4.0 |
| | Total | 25 | 100.0 |
| Risk of price changes | Yes | 12 | 48.0 |
| | No | 12 | 48.0 |
| | No Response | 1 | 4.0 |
| | Total | 25 | 100.0 |
| Low patronage of produce/products | Yes | 10 | 40.0 |
| | No | 15 | 60.0 |
| | No Response | - | - |
| | Total | 25 | 100.0 |
| Transport difficulties | Yes | 8 | 32.0 |
| | No | 17 | 68.0 |
| | No Response | - | - |
| | Total | 25 | 100.0 |

Source: Field Survey, 2008

Table 4.12b: Rankings of the factors affecting volume of trade

| Constraint | Rank | Freq. | % |
|-----------------------------------|-------------|-------|------|
| Limited Supply | 1 | - | - |
| | 2 | - | - |
| | 3 | - | - |
| | 4 | 1 | 4.0 |
| | 5 | 6 | 24.0 |
| | No response | 18 | 72.0 |
| Risk of quality deterioration | 1 | 3 | 12.0 |
| | 2 | 3 | 12.0 |
| | 3 | 1 | 4.0 |
| | No response | 18 | 72.0 |
| Risk of price changes | 1 | 1 | 4.0 |
| | 2 | 1 | 4.0 |
| | 3 | 5 | 20.0 |
| | No response | 18 | 72.0 |
| Low patronage of produce/products | 1 | - | - |
| | 2 | - | - |
| | 3 | - | - |
| | 4 | 6 | 24.0 |
| | 5 | 1 | 4.0 |
| | No response | 18 | 72.0 |
| Transport difficulties | 1 | 9 | 36.0 |
| | 2 | 3 | 12.0 |
| | 3 | 1 | 4.0 |
| | No response | 12 | 48.0 |

Source: Field Survey, 2008

Limited supply usually occurred during the dry season while low patronage was commonly experienced in the rainy season. Risk of quality deterioration was probably due to inadequate preservation methods and lack of storage facilities

5. 0. Findings and Recommendations

The following recommendations are made for a comprehensive production and marketing strategy for improvement of the cocoyam leaf industry.

5.1 Production side Issues that needs to be addressed

- Lack of officially released cocoyam varieties specifically for leaf production to meet part of the vegetable needs of the people in the communities.
- Superior qualities such as early maturing, resistance to diseases and pests, good pounding ability and long shelf life for cormels should be selected for.
- The transfer of mono-cropping technology for cocoyam cormel and leaf farms under intensive crop management practices should be done to enhance cocoyam farming business.
- To stimulate continuous production and supply response to high market demand during the dry season, intensive crop management practices need to be encouraged by provision dams and irrigation schemes. For commercial production of cocoyam leaf in the dry season (peak demand period), irrigation facilities are inevitable.

- An intensive research into the post-harvest issue of cocoyam leaf and cormels must be conducted to avert the massive losses farmers and traders incur. Thus appropriate processing and storage techniques need to be developed to add value to the crop.
- A comprehensive study on yields of cocoyam cormel and leaves should be conducted.

5.2 Challenges in marketing of cocoyam leaves that needs to be addressed

- At the trader level, challenges such as risk of quality deterioration, risk of unstable or limited supply, and transportation difficulties must be wholly addressed to ensure an effective and efficient marketing system.
- Improved processing and preservation methods coupled with appropriate and adequate storage facilities must be researched into and applied to minimize or possibly eliminate losses.
- Excessive heat was the main factor causing deterioration of cocoyam leaves at the trader level. Cold and high humidity storage facilities need to be developed to help preserve the desired qualities for cocoyam leaf.
- Consumer preferences for cocoyam leaf are based on qualities including freshness, colour and tenderness (texture) and these must be maintained by any preservation and processing techniques that will be developed.
- Local farmers are currently preserving cocoyam leaves in an airy place (48.1%) or left in the open overnight (51.9%).
- Demand and supply of cocoyam leaf high fluctuates in these production areas. Hence, the produce becomes highly seasonal. Low supply/highest price months are December/January – March/April depending on the rainfall pattern in a particular year. Therefore production under irrigation needs to be ensured to ensure an all year round production.
- There is the need to have appropriate and well developed business plans for the cocoyam industry to facilitate commercial scale investment decisions.

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