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Full Length Research Paper

Socioeconomic constraints to sustainable cocoyam production in the Lake Victoria Crescent

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Cocoyam production has the potential of significantly improving the food security status and income levels of farmers in the Lake Victoria region. The study covered various areas of the three East African states, Kenya, Uganda and Tanzania as follows: Kisumu, Kakamega and Siaya districts in Kenya; Bukoba in Tanzania; and Mukono, Wakiso and Kampala in Uganda. Structured questionnaires were used to collect data from a total of 283 respondents. Results showed that farmers had an adequate level of education that enabled them utilize cocoyam production technologies. However, land scarcity was the major factor limiting cocoyam cultivation. This was attributed to the fact that cocoyam cultivation was restricted to wetlands, which was already a limited resource in the region. Other factors such as diseases, weeds, pests, scarcity of labour, unavailability of extension services and planting material and improved varieties, among others influenced the production of the crop. Research and development agencies in the study area need to develop appropriate cocoyam production technologies to mitigate existing constraints

Key words: Cocoyam production, social and economic constraints, Lake Victoria region.

INTRODUCTION

Cocoyam (*Colocasia esculentum* and *Xanthosoma sagittifolium*) originated in the Indo-Malaysian region, perhaps in Eastern India and Bangladesh. It then spread east-wards into southern Asia and the Pacific Islands and westwards to Egypt and the Eastern Mediterranean. Finally, it spread southwards and westwards into East and West Africa. The cocoyam, therefore, is an intro-duced crop in East Africa (Kizerbo, 1990).

The cocoyam is among the major crops grown in wetlands. Its corms, cormels, stalks and inflorescence are all utilized for human consumption. In South East Asia, cocoyam leaves are consumed as green or dry vegetable and the stem is either cooked and eaten on its own or together with other dietary staples or pound into flour. The leaves are consumed because they are rich in protein and vitamins while the root is rich in carbohydrates and minerals (Duru and Uma, 2002). In East Africa, cocoyams have traditionally been steamed and eaten as a snack alongside tea or a beverage. Contrastingly, cocoyams in Cameroon are prepared, processed and consumed in a variety of ways including eating with a vegetable sauce, as *ekwen* (tying grated, peeled corms with younger leaves together with palm oil, fish, crayfish, salt and pepper), *belb* (a sauce), *kokhi-beans* (together with beans and plantain), *kokhi-corn* (together with corn), or as *akwacoco* (porridge) (Tandehnije, 1990).

A study in Hawaii indicates increased contribution of cocoyams in the Hawaiian economy and increased popularity of cocoyam products in the world market. The study estimated the cost of production of cocoyams at US$ 6175 per acre with labour accounting for 49% of the total cost. Machinery and equipment was estimated to contribute to about 23% of the production cost (Valenzuela and Sato, 1991). Cocoyams have also been established to be a low maintenance crop that will main-

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Table 1. Age and sex of respondents.

Category/ Country	Sex of Respondent		Age Range of the Respondent (Years)		
	Male (%)	Female (%)	18-39 (%)	40-59 (%)	>60 (%)
Uganda	58.9	41.1	52.2	28.9	17.8
Tanzania	40.7	59.3	-	-	-
Kenya	70.0	30.0	9.0	59.0	22.0
Average	56.5	43.5	30.6	44.0	19.9

Source: Field survey, 2005

a ground cover in the field to reduce soil erosion.

Other studies indicate that the potential of cocoyams being processed into snack foods depends on economics and public acceptance. Unless costs of production can be reduced drastically through mechanization and selection of earlier maturing clones, the future potential of cocoyams is not bright. In the USA, the importance of cocoyams is indicated by its increased production value from US$ 6.5 million in 1983 to US$ 7.7 million in 1987 (O'Hair, 1998).

Most of the world's food- poor people live in sub-Saharan Africa. For example, in 2004, 48.4% of Kenya's population was considered as food poor (RoK, 2004). Cocoyams are generally grown in the wetlands with minimal input and offer a high potential for alleviating food insecurity and income constraints. They are rich in vitamin, proteins, carbohydrates and starch. There is widespread, small-scale cocoyams growing within the wetlands of Lake Victoria basin in East Africa. However, its contribution to food security and economy has not been established. Limited literature is available regarding the constraints in enhancing Cocoyam production in the East African region. This study was therefore conducted to bridge this knowledge gap.

METHODOLOGY

The study areas were purposely selected based on districts that surround Lake Victoria and where Cocoyams are grown. These were Kisumu, Kakamega and Siaya districts in Kenya, Bukoba in Tanzania, and Mukono, Wakiso and Kampala in Uganda. The sample frame consist the set of small scale farmers who grow Cocoyams. A random sampling procedure was used to select 283 respondents. A questionnaire was developed and pre-tested in September 2005 and then administered to the selected respondents. A wide range of data in respect of the age, sex, education level, household size, land tenure system, reasons for cocoyam production, labour allocation, cost of production, output levels, marketing and constraints to production were collected. The Statistical Package for Social Scientists (SPSS) was used to analyze data and generate meaningful results.

RESULTS AND DISCUSSIONS

Age and sex of respondents

The results show that the majority of the respondents (56.5%) were men. With respect to age, 44% of them fell between 40 and 59 years, 19.9% were above 60 years and 30.6% were below 29 years of age. Table 1 show the sex and age statistics of the respondents.

These statistics indicate a representative sample whose information can be generalized to the wider farming community. The females are well represented (43.5% of the sample) with the age range depicting a normal distribution. However, there was more involvement of men in cocoyam production in Kenya (70%) and Uganda (60%) when compared to Tanzania (40.7%). This is because the surveys were done in "urban" areas where a commercial value is associated with the crop and usually men dominate such crops, while in relatively rural areas of Bukoba in Tanzania, more female farmers were interviewed (59%) and the crop was indicated to be used equally for food and as a source of income.

Education level of the respondents

On average, a majority of the respondents (93.8%) had attained at least primary education, with 63.5% of them having primary level education, and 27% having secondary education. Table 2 shows the level of education amongst the respondents interviewed.

These statistics imply that most farmers are able to read and write and can therefore use messages on developmental issues, including disseminated interventions on cocoyam production and processing.

Land enterprise allocation

Land ownership varied with country; in Kenya communal land ownership with or without title deeds was the most common tenure system with 87.4% of the respondents. The common mode of land acquisition in the area is inheritance of ancestral parcels. In Uganda, most of the interviewed farmers indicated to have leased or hired the land (47.8% of respondents), while in Tanzania most of the land is free hold (Table 3). The results further show that 75.8, 80.2 and 62.2% of the farmers have less than 0.5 hectares (1 acre) in Kenya, Tanzania and Uganda respectively. Most of the farmers had 0.5 - 1 hectares of land, part of which was allocated to cocoyam cultivation. To reveal the importance of cocoyam in the farming system, the amount of land allocated to the crop was calculated.

Table 2. Education level of the respondents in the Lake Victoria Basin.

Category/Country	Nil Education (%)	Primary Education (%)	Secondary Education (%)	Others (%)
Uganda	10.0	46.7	35.6	7.8
Tanzania	8.5	72.9	16.9	1.7
Kenya	0.0	70.8	29.2	0.0
Average	**6.2**	**63.5**	**27.2**	**3.1**

Source: Field survey, 2005

Table 3. Proportion of land ownership by respondents.

Category/Country	Land Ownership Category (%)			Acreage of Land Owned (%)		
	Customary or Communal	Freehold	Lease/hired	0.5 – 1 acres	1.5 – 4 acres	5 Acres
Uganda	16.7	35.6	47.8	62.2	36.7	1.1
Tanzania	44.1	54.2	1.7	80.2	15.3	-
Kenya	87.4	8.1	4.5	75.8	23.4	1.0

Source: Field survey, 2005

Table 4. Constraints to cocoyam cultivation and utilisation**.**

Constraint	Uganda (%)	Tanzania (%)	Kenya (%)
Land scarcity	67.8	74.6	70.2
Diseases	45.6	84.3	5.4
Weeds	43.3	59.3	35.8
Pests	41.1	-	24.6
Scarcity of labour	35.6	50.3	45.8
Theft	34.4	-	19.8
Lack of extension services	32.2	88.1	46.4
Planting materials unavailability	25.6	-	32.5
Lack of post harvest knowledge	25.6	25.6	27.8
Cocoyam itching while peeling	25.6	1.8	17.2
Soil infertility	24.4	7.0	30.3
Perishable planting materials	23.3	-	16.8
Vermin	21.1	12.2	27.9
Lack of improved varieties	6.7	-	8.5
Low yields	-	16.9	-

Source: Field survey, 2005

The proportions of land allocated to Cocoyam cultivation was 60, 25 and 45% in Uganda, Kenya and Tanzania respectively. In terms of acreage, this allocation translates to at least 0.1 hectares of their land.

Constraints to cocoyam cultivation and utilization

Most of the farmers interviewed in the study area reported land scarcity as the major factor limiting cocoyam cultivation. This is attributed to the fact that cocoyam cultivation is restricted to wetlands, which is already a limited resource in the region. Besides, cocoyam cultivation is also viewed as only grown by those people who have access to wetlands. Among the others, the other major constraints to cocoyam cultivation reported were pest and disease attack, weeds, scarcity of labour, unavailability of extension services, planting material and of improved varieties. Table 4 shows the proportions of the respondents who reported the various constraints as limiting cocoyam production in the region.

Despite these constraints, cocoyam cultivation is still preferred since it is a good food security crop that is available throughout the year and is also a stable source of income. For example, of the respondents interviewed in Tanzania and Uganda, 97 and 98%, respectively, grew

cocoyam the previous year, of which 93 and 100% grew it for food, and 15 and 89% for income. In Uganda, 28% of the respondents grew cocoyam as a routine activity.

Conclusion and Recommendation

Farmers in the study area have an education level that can enable them adopt cocoyam production technology. The proportion of land that is allocated to Cocoyam production is substantial (up to 60% of the land holding in Uganda). Cocoyam therefore is considered as important to the livelihoods of farmers in the Lake Victoria basin, providing both food and income. However, the major constraint is land scarcity, diseases, weeds, pests, scarcity of labour and lack of extension services. Being a labour intensive food crop, increased production would help meet the twin objectives of food security and increasing household incomes in the area under study which is food insecure and poverty stricken through income generation by employing labour and sale of output. We recommend that research and development agencies in the region need to develop cocoyam production technologies to mitigate the existing constraints. These should include pest and disease control, varietal development and post harvest management.

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