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Studies on Awareness and Accessibility to Agricultural Technology Information by Dry Season Vegetable Farmers in Mubi, Nigeria

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Abstract: Dry Season vegetable production (Fadama) plays a key role in the economics of Adamawa state as a basic source of food, income and employment especially for resource poor farmers. A study was under taken to assess the socio-economic characteristics of dry season vegetable farmers, types of vegetables cultivated, problems and constraints to rapid development, problems associated with low yield and income. Findings revealed that the youths are involved in dry season irrigation farming and that the household size could be a dependable source of labour. Onions, cabbage and tomatoes are largely cultivated as compared with other vegetables. Lack of capital, inadequate agricultural technology information and inputs limits large scale production. Bore holes constructed along the banks of the river was identified as a major source of water and the use of motorized pump was identified as the technology used in dry season farming. The farmers indicated the need for agricultural extension services, but the dearth of extension staff limits achieving high productivity.

Key words: Fadama, irrigation, problems and constraints, agricultural technology information

INTRODUCTION

In Nigeria the small-scale traditional irrigation along the country's fadama covers about 90% of the irrigation land (Pradhan, 1993). The fadama is an Hausa word meaning the seasonally flooded or inundated flood plain along the major rivers and streams in savannah agro-ecological zones. Farmers involved have subsistence background and purely practice ancestral skills acquired from their parents (Mofeke *et al*., 2003).

Irrigation agriculture plays dominant roles in Nigerian agriculture because of the distinct dry season starting November and lasting till the middle of March each year. During this period no rainfall is experienced and irrigated agriculture is the only viable option left for food crop production. It is in response to this problem that the Nigerian government established a large scale irrigation projects around the major rivers in Nigeria. At present there are eleven of such projects called the River Basin Development Authority, with each project named after the river which the project is formed (Ogunjimi and Adekala, 2002). However, these projects are fraught with management problems that have limited their impact on food supply in Nigeria. Some of these problems and suggested solutions to overcome them have been documented (Adekalu and Ogunjimi, 1996).

Several government socio-economic and rural transformation policies have reinforced the expansion of the Fadama. This has drastically reduced the reliance on imports and increased domestic production of vegetables. The cultivation of vegetables as a remarkable source of income and in attaining food security has been a focal point in agricultural development plan in sub Sahara Africa. Dry season vegetable production is more reliable and income generating as compared with the rain-fed vegetable production. Increase vegetable production has improved the family diets and increase family income especially that of women, who often grow, preserve and sell vegetables (IITA, 1989). At present a greater proportion of vegetables are grown in home gardens and lowland fadama areas. The incorporation of the fadama irrigation activities into the National Agricultural Development Programme had increased the participation by resource poor farmers. The irrigation needs of vegetable farmers depend largely on the ecological factors and the growth pattern of the crops. The common irrigation methods among vegetables farmers are surface, sprinkler, trickle and surface irrigation methods. The choice of these methods depends on the availability of capital, inputs, literacy and technical know-how among other factors. Dry season vegetable production is common among farmers in the North Eastern Nigeria and it has contributed much to the production of food and fibre, still there is need for improvement

Dry season vegetable production has been a source of livelihood for farmers living in the cities, which are

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characterized by a high population density. This trend has ensured a steady supply of vegetables to the populace through the year. Morgan (1985) and Adepetu (1985) had posited that the growing market for vegetables and fruits have been enhanced by the introduction of petrol driven engines. Also, the long dry season have resulted in the adoption of small scale irrigation by farmers. The low realizable income from dry season vegetable farming may be associated with factors as socio-economic characteristics of the farmers, non availability of inputs and infrastructure, inadequate and or in appropriate technologies. These limit the achieving a significant returns on investment. Therefore, it is pertinent to understand the constraints faced by vegetable farmers in adoption of agricultural technology information, production and management. This will assist in making recommendations for improvement in their existing status. The objectives of the study are:

- To determine the socio-economic characteristics of the vegetable farmers and the types of vegetables cultivated.
- To examine the impact of extension services in the use of irrigation technologies by the respondents.
- To determine the relationship between selected variables and awareness of irrigation technologies by the farmers.

To achieve these objectives hypotheses set includes:

- There is no significant relationship among socio economic characteristics of the farmers and adoption of agricultural technology information.

MATERIALS AND METHODS

This study was carried in three location noted for Fadama vegetable farming in Mubi North Local Government area. The surveyed farmers have farmlands along situated along the tributaries of river Jezegema, which passes through the Mubi city. These locations are noted for cultivation of vegetables in the state. A random sample of 22 farmers was selected from each of the location to make a total of 86 respondents as a sample frame for the study. Questionnaires were administered by the research team of the Departments of Crop Science and Agricultural Economics and Extension of the Adamawa State University and the extension staff of the State Agricultural Development Project. Most of the issues addressed by the questionnaires includes socio-economic parameters, sources of water, irrigation methods, agronomic practices soil and water management practices, problems encountered in irrigation farming and mode and types of assistance received.

Information collected were summarized and analyzed using descriptive statistics as percentages and frequency. The Chi-square test was used to describe relationship between certain variables. Other quantitative tests were in the study were carried out using SPSS (1993) computer software.

RESULTS AND DISCUSSION

The socio-economic characteristics of the farmers are shown in Table 1. Most of the farmers are of the male sex. This indicates the preponderance of the male sex in dry season vegetable production as compared with the female sex. To a large extant, 95% of the respondents are married, therefore they could maintain a permanent residence in

Table 1: Socio-economic characteristics of the farmers

	Frequency	(%)	df	Chi square	Prob>.Chi
Gender					
Male	80	93	1	63.07	0.001
Female	6	7			
Marital status					
Single	4	5	3	70.74	0.001
Married	82	95			
Divorced	0				
Widowed	0				
Educational attainment					
Illiterate	30		2	38.52	0.001
Post primary	24				
Quaranic	32				
Primary occupation					
Fulltime farming	84	98	1	78.19	0.001
Par time farming	2	2			
Land tenure					
Family land	28	33	3	52.60	0.001
Rented	46	53			
Lease					
Purchased	4	5			
	8	3			

Table 2: Agronomic practices adopted by surveyed farmers practicing dry season vegetable farming

Parameter	(%)
Size of the farmland	
1ha	53
2ha	37
3ha	2
4ha	2
5ha	5
Vegetables grown*	
Onions	78
Cbbage	63
Tomatoes	66
Amaranthus	47
Lettuce	42
Hibiscus	47
Okra	37
Land ownership	
Lease	3
Rent	53
Family owned	33
Purchased	3
Land use problems	
Low fertility	70
Flooding during rains	10
Erosion	20

*= Multiple responses

their area of operation and continue with practice of vegetable farming. Thirty two percnet of the respondents interviewed had quoaranic education, 24% had post primry educational qualification. The foregoing suggests that their preference for quaranic education as compared with western education. Therefore, proposed technology for the farmers must be simple and easily adaptable. The respondents indicated that they are into full-time farming (98%). The mean age of the respondents was 25 years, with a range between 22 and 66years. The mean number of family size as evaluated in the study area was 5 with a range from 3-18. This shows that farmers in the study area had a relatively large number of children, which could readily be used to augment their farm labour.

Agronomic activities: Table 2 shows the agronomic activities practiced by the vegetable farmers. Farmers having between 1 and 2 ha summarized 90% of the respondents with most of them (53%) renting their farmlands. Our finding differs from previous reports by Ogunjimi and Adekalu (2002). Most of the farmers complained that they were finding it difficult to increase their area of cultivation due to lack of capital and inputs. The farmers grow mainly Onions (78%), Cabbage (63%) and Tomatoes (66%). Most of the farmers surveyed complained that low fertility due to prolong use of the land and to a lesser extent a few complained of erosion and flooding on their farmlands during the rainy season. Both farm erosion and flooding could be expected as most fadama vegetable farmland are located on the banks or adjacent to streams or rivers. More so the physical properties of the soil allows for poor drainage.

The study indicated that a sizeable number of the farmers interviewed obtained water for irrigation from the boreholes as compared with other sources of water as dugged wells, reservoir dams and streams. Therefore, most of the farmers establish their farms close to the perennial source of a flowing stream. Most of the farmers complained that the flow of the river is irregular and the wells often dry up, at the peak of the dry season, leading to crop failure and low yields. A substantial number of farmers surveyed practiced surface irrigation as compared with furrow and check basin irrigation methods. However, the use of hand watering is less common in these locations. Basin and furrow irrigation methods are labour intensive as evidenced in the study by 4% of the farmers adopting this technology. Majority of the farmers interviewed use regular intervals of irrigation and control the amount of water used based on their experience and intuition. The use of a standard calculation to estimate the water requirement and scheduling water needs is limited. However, 95% of the farmers feel the soil as a determinant of water used by he plants. This probably could be that most of the farmers are illiterate, thus lacking, western education. It was observed that most farmers irrigate their farms in the morning. While a few of them irrigate their farms only in the evenings (Table 3).

Table 3: Types of irrigation methods adopted by the farmers

Source of irrigation water	Frequency	(%)	df	Chi square	Prob>.Chi
River/streams	6	7	3	127.63	0.001
Boreholes	77	90			
Dugged wells	1	1			
Reservoir	2	2			
Type of irrigation water					
Motorized pump	78	91	2	197.62	0.001
Tube well	6	7			
Wash-bores	2	2			
Calabash	0	0			
Irrigation methods					
Surface irrigation	82	96	3	148.83	0.001
Furrow	2	2			
Check basin	2	2			
Irrigation schedule					
Morning	47	55	1	99.27	0.001
Evening	39	45			

Table 4: Input use and extension services available to farmers

Fertilizer use	(%)
Organic	3
Inorganic	97
Awareness of agric extension services	
Yes	91
No	2
Extension contact	
Always	30
Occasional	60
Never	10
Source of information	
Extension personnel	20
Radio	4
Television	4
Friends	72
Usefulness of extension services	
Very useful	10
Useful	60
Partially useful	20
Not useful	10

The soil conservation practice in the study area is the application of fertilizer to improve the productivity of the land, the majority (97%) of the farmers use inorganic fertilizers, the high cost and non-availability of inorganic fertilizer limits large scale production. Similarly, it was observed that the use of insecticides was a major component of vegetable production in the study area meaning that the farmer will incure more cost in production Most farmers interviewed (84%) acknowledged the presence of Agricultural Extension services in their areas. However, 20% of the farmers indicated that they receive information on irrigation technology through the Village Extension Agent in their areas. While 72% had received information on irrigation technology through their friends. Sixty two percent of

Table 5: Relationship between selected variables and adoption of technology

Variables	Correlation coefficient
Age	0.27*
Numbers of children	-0.04
Household size	0.34*
Extension contact	0.37*
Size of farmland	0.03
Land tenure	0.31*
Awareness	0.29*

*= Significant at 5% level of probability

Table 6: Constraints identified in dry season vegetable problem

Constraints	Mean rank	Ranking
Inadequate fund	6.64	1
lack of knowledge of technology	6.22	2
Lack of assistance of from extension	5.56	3
Non awareness of technology	5.32	4
Technology not relevant	3.84	5
Cultural factors	2.88	6
Technology not available	2.18	7

Table 7: Awareness of improved technologies*

Technologies	(%)
Seed dressing	98
Soil management	12
Water management	12
Disease management	21
Pest control	31
Storage	25
Processing	10
Market information	18

*=Multiple responses

Table 8: Adoption of selected agricultural technology information

Technology	Level of awareness	Level of adoption
Seed dressing	27.5	2.87
Water management	23.4	2.9
Disease management	25	2.0
Pest management	23.5	2.0

the farmers indicated that they found the extension services useful in production of vegetables. But occasional contacts with extension personnel, may account for low level of information on irrigation technology communicated to the farmers. This will have direct implication on the productivity of the farmers. Majority of the respondents find the extension service useful as regards their use of irrigation technologies for the production of vegetables (Table 4).

Table 5 shows the relationship between the socio economic variables and adoption. The relationship was positive for and significant for age (r = 0.27*), household size (r = 0.34*), extension contact (r = 0.37*), land tenure (r = 0.31*) and awareness (r = 0.27*). The positive correlation between adoption and awareness denote that as the farmers become aware of improved agricultural technology information, the adoption will consequently rise for such technology information. Similarly, as the farmers have more contact with the extension agent an improvement in their adoption rate is expected.

Perceived constraints by the respondents (Table 6) in the use of irrigation technologies includes lack of funds, poor assistance from extension, non awareness of technologies, irrelevant technologies, technologies not available, socio-economic and socio-cultural constraints. Of these constraints, inadequate funds and lack of adequate technology were identified as important in using available irrigation technology.

An evaluation of the awareness of improved technology by the respondents showed that seed dressing and pest control were most common and to a lesser extent were other technologies among the vegetable farmers (Table 7).

As shown in Table 8, the extent of awareness and adoption of improved technology by vegetable farmers vary i.e. seed dressing (27.5), water management (23.40 pest management (23.5) and disease management. The low rate of adoption of pest and disease management control measures may be associated with the high cost of agrochemicals. This will make this technology very unattractive to adopt. In another evaluation Dike and Oparaeke (1997) had posited that the use of pesticide was very effective, but uneconomical at the farmers' level. This could be the major reason for a low rate of adoption among the vegetable farmers surveyed.

CONCLUSION AND RECOMMENDATIONS

The study revealed that the dry season vegetable farming has been very important in the supply of both fruit and leafy vegetables to the residents in Mubi. However, lack of capital and non availability of improved technologies is limiting the performance of these farmers. The farmers acknowledged the existence of Village Agricultural Extension Agents, but their non accessibility to services provided by them limit their production potentials. Hence most of the farmers operate on a small scale. The study therefore, recommend that to ensure adequate food supply and provide employment for teeming population, proper and adequate visit of the Extension Agents to the farmers and provision of farming inputs are necessary.

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