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Assessment of the Training Needs of Fadama Farmers for Future Agricultural Extension Work Development in Osun State, Nigeria

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Abstract: The study assessed the training needs of fadama farmers in Osun State for future agricultural extension work development. Primary data on fadama farming were collected from 150 fadama farmers selected using random sampling technique. The data were analyzed using descriptive statistics, correlation matrix and regression techniques. The results of analysis indicated that fadama farming is practiced mostly very close to boundaries of major towns and cities. The mean age of fadama farmers was 40 years. Areas of training needs identified by the fadama farmers include: chemical control of insect pest, use of appropriate chemical and correct dose of application; appropriate herbicide to be used to reduce drudgery and storage of fadama produce. The result showed a negative but significant relationship ($b = -0.302$) between the number of years of formal education and training need expressed by fadama farmers. Also the correlation coefficient showed that size of household ($b = 1.230$), size of fadama farmland ($b = 1.245$), hour spent on farm ($b = 1.469$) and previous fadama trainings attended ($b = 7.567$) were positive and significant at $p \leq 0.05$. The study concluded that extension agents and agencies should design regular training programmes for fadama farmers in the area of deficiencies identified and strengthen fadama associations such that tripartite problems of lack or high cost of inputs, lack of starting and operating capital and fadama land could be reduced/solved.

Key words: Assessment, training needs, fadama farmers, agricultural extension and development

INTRODUCTION

Fadama is an Hausa word meaning a valley-bottom, flood plain, or a low-land around a river that floods or becomes wet when the river is high. Fadamas is defined as flood plains and lowly areas underlined by shallow aquifers and found along Nigeria's rivers system (Blench and Ingawa, 2004). Fadamas have been sources of economic power to many groups of individuals called Fadama Resources Users (FRUs). Fadama resource users according to Blench and Ingawa (2004) are farmers, pastoralists, fisher folk/fisher women, hunters and others e.g., gatherers, who directly depend upon the natural resources of the fadamas for their livelihoods. Fadama resource users may also comprise private operators who provide complementary infrastructure and services for increasing productivity, storage, diversification and market access for fadama resources users. Fadamas usually flood naturally but the term is also applied to areas where people have channeled or pumped water for their farms or other purposes. In Nigeria, fadamas tend to be areas of reeds, teeming fish and bird life.

Fadama farmers are usually peasants, small-scale farmers that cultivate the low land, usually around stream and riverbanks. These farmers cultivate vegetables for

town and city population during the dry season when a proportion of flooded surface water must have evaporated. Towards the end of the dry season and on-set of rainfall, these farmers cultivate maize and early maturing vegetables. Fadama farmers are peasants who carry out their farming with their crude implements like cutlass and hoe. These dry seasons farming does not exclude women and also cut across productive ages.

Ojo (2000) described dry season farming as a common practice in peri-urban or urban areas for production of vegetables and cereals for the ever-increasing population of the urban centres. Ladele and Omotosho (2000) pointed out that urban agriculture in Nigeria has not been given much policy considerations. This has resulted in deficiencies in some technical and managerial skills of fadama resources use. In order to achieve optimum production level, resources must be available and whatever quantities of available resources need be utilized efficiently. Successful and result-oriented farming requires the skill and knowledge of the farmers, which can only be attained through the right training.

Ajayi (1995) stated that training is acquisition of the best way of utilizing knowledge and skill. Also Proctor and Thornton (1961), defined training need as skill, knowledge and attitude an individual requires in order to

overcome problems as well as to avoid creating problem situations. From the definitions above it is clear that training is an essential resource, which will direct knowledge and skill towards production. Leagan (1971), explained need as the difference between what is and what ought to be. This implies that a gap is created between the two conditions. Need therefore show that there is lack of something, which if present, would better the welfare of an individual or group of individuals whose situation is at stake. Marsden and Peter (1998), stated that the aim of training is threefold: to provide workers with the appropriate tools (both conceptual and technical) to carry out their work more effectively; to make them aware of recent comparative developments within their field of interest and to open up alternative ways of thinking and implementing social development programmes. Training thus combines sectoral with holistic approaches in attempts to provide access to and interpretations of current information. Williams (1984), identified four methods of training, pre-service training, induction training, in-service training and on-the-job training. The type of training required by the fadama farmers, who had already got the knowledge and skill in farming therefore is the in-service or on-the-job type of training. The required training is for the fadama farmers to effectively utilize the already acquired knowledge in fadama farming. Many studies have established the training needs of different target audience for strategic future extension planning and development. Farinde and Ajayi (2005) investigated training needs of women farmers in livestock production and drawn implications for rural development in Oyo State of Nigeria. The study found that the weighted mean scores in knowledge and skills of women farmers were low in compounding animal feeds, breeding, identification and diagnosis of sick animal, selection and administration of drugs. In essence, empowerment of women farmers through adequate training in all the expressed areas of training needs in livestock production is a predisposing factor to sustainable livelihood and consequence participation in rural development. Sabyasachi Roy (2003) determined the perceived training needs of rural youths in diversified agriculture and other employment generating activities in Karnal district of Haryana, India. It was found that most of the rural youths desired training in vegetable cultivation, followed by dairy farming, crop farming, motor repairing and in the use of new information technologies.

Ajayi *et al.* (2003) in their study of Women farmer training needs and their correlates for effective extension programme and poverty reduction in Oyo State of Nigeria found that women farmers had low knowledge and skills in performing the following farm operations: chemical weeding and pest control, preparation and utilization of

organic fertilizer, livestock and poultry breed selection and construction of livestock houses. Other areas of training needs are identification and treatment of sick animals, slaughtering and dressing of animals and marketing of livestock. Adesoji *et al.* (2006) isolated determinants of training needs of fadama farmers in Osun State of Nigeria as socio-economic, informational, credit, land resources, culture and training related factors. None of these studies focused on the assessment of the training needs of fadama farmers for future Agricultural extension work development in Osun State, Nigeria.

This study therefore set the following objectives:

- Identify the training needs of fadama farmers;
- Identify important variables to be considered when organizing training programme for fadama farmers.
- Examine the socio-economic characteristics of the fadama farmers in Osun State and relationship with their training needs.

MATERIALS AND METHODS

The data for the study were collected from fadama farmers in the three agricultural zones of Osun State. Multi-Stage sampling method was employed to select the farmers. Five blocks were randomly selected from the eight blocks in each of the three agricultural zones. Five cells were also randomly selected out of eight. Ten farmers were selected from each cell and structured interview schedules were administered on them using simple random sampling technique. A total of one hundred and fifty fadama farmers were interviewed in all using trained enumerators in the sampled cells.

Information was collected on the demographic characteristics of the respondents, size of fadama farm(s), hours spent daily on farm, sources of information and inputs, training needs expressed, technology used and training methods preferred. The variables investigated in the study were operationalized as follows:

Training needs: Areas of fadama farmers where training is required.

Age: Number of years of existence from birth.

Education: Years of formal education received by a fadama farmer.

Household size: Number of persons eating from the same pot (father, mother, children and relation living with them).

Size of fadama farm: Number of hectareage under fadama farm cultivation

Fadama farming experience: Years of fadama farming by each farmer (respondents).

Crop cultivated: Number/types of crops grown under fadama farming by each respondent.

Hour spent on farm: Average number of hours spent in doing farming operations in a day by each respondent.

Period of day work: This is the timing of farming operation under fadama farming

All day	-	5
Morning + Evening	-	4
Morning + Afternoon	-	3
Afternoon + Evening	-	2
Morning only	-	1

Source of input: Number of sources employed by each respondents to procure/gather farm input for use.

Income: Amount of money realized from the sale of produce from fadama farm/season.

Formal training attended: Number of relevant on-the-job trainings attended by each respondent.

Training methods desired: Number of training methods each respondent preferred for his training.

Training needs is the dependent variable, which was operationalized as number of the areas of fadama farming operations where training is required by each of the fadama farmers (respondents).

RESULTS AND DISCUSSION

Personal and socio-economic characteristics: Data in Table 1 show that 76% of the respondents were male while the remaining 24% were female. This shows that more male were involved in fadama farming in the study area. The mean age of fadama farmers is 40.8 years with 11.16 standard deviation. The data revealed that bulk of fadama farmers (66%) fell within the productive age, (15-45 years). And that few aged farmers were involved in fadama production. This might be due to the laborious, back bending activities involved in the production. Only 24% of the respondents were muslim while 76% were christians. Also majority (84%) of the respondents were married and only 16% were not married. This may mean

that fadama farming serves as an additional source of income to farm families. Table 1 shows that 35.42% of the respondent had up to secondary school education level, 31.25% were of primary school level and 20.83% had education at the tertiary level. Most fadama farmers had formal education. The mean years of formal education for the respondents was 10.62 years with 4.36 standard deviation.

Data in Table 1 also show that 32.7% of the respondents borrowed their fadama land without any payment while 32.7% hired or rent the land on payment of

Table 1: Personal and socio-economic characteristics of fadama farmers N = 150

Characteristics	Frequency	Percentage	Mean
Sex			
Male	114	76.00	
Female	36	24.00	
Total	150	150.00	
Age			
15-30	33	22.00	
31-45	66	44.00	
46-60	42	28.00	
Above 61	09	06.00	40.8
Total	150	150.00	
Religion			
Islam	36	24.00	
Christianity	114	76.00	
Total	150	150.00	
Marital status			
Single	24	16.00	
Married	126	84.00	
Total	150	150.00	
Level of formal education			
Primary school	45	31.25	
Modern school	18	12.50	
Secondary school	51	35.42	
Higher Institution	30	20.83	
Total	144	100.00	
Source of farm land			
Borrowed	48	32.70	
Inherited	30	19.20	
Purchased	09	5.80	
Hired/Rent	48	32.70	
Lease	15	9.60	
Total	150	100.00	
Size of farm land			
0.4-0.8 ha	78	52.00	
0.9-1.6 ha	51	34.00	
1.7-2 ha	15	10.00	
>2 ha	6	4.00	2.62
Total	150	100.00	
Distance of farm from town			
<1-2 km	60	40.00	
2.1-4 km	69	46.00	
4.1->5 km	21	14.00	2.86
Total	150	100.00	
Tribe			
Yoruba	108	72.00	
Ibo	42	28.00	
Total	150	100.00	
Crops cultivated			
Tomato	66	44.00	
Okro	12	8.00	
Leafy vegetable	129	86.00	
Maize	90	60.00	

Source: Field Survey, 2004

specified fee. Only 19.2% of the respondents were using inherited land for their fadama farming. Only 5.8% of the respondents were using purchased land for their cultivation from outright purchase. About 86% of the respondents cultivated only about 0.4 and 1.6 ha, while about 10% cultivated between 1.7 and 2 ha. Only about 4% cultivated above 2.0 ha. The mean size of fadama farmland was 1.0 ha. This shows clearly that fadama farmers are small-scale farmers. This finding is in supports of the finding of Ojo (2000). In his study of impact of Agricultural Extension Services on dry season farming in Ilesa West Local Government Areas of Osun State.

Most (32%) of the respondents had their fadama farms between 2.1-3 km from town. A total of about 72% had their farms about 3kms from town and only about 24% had their farms between 3.1 and 5 km and only 4% had their farms more than 5 km from town. The findings show that most fadama farms are very close to towns and cities. The reason might be to serve the population of the towns and cities that constitute the market for their produce. Only Yoruba and Ibo tribes were involved in fadama farming in Osun State with 72% of the respondents being Yoruba and the remaining 28% being Ibo. About 22% of the respondents had up to 10 years fadama farming experience. Also about 22% had more than 10 years farming experience in fadama. The mean year of fadama farming experience was 8.68 with 5.1 standard deviation. Crops cultivated include leavy and fruit vegetables such as Tete, *Amaranthus* sp., Soko, *Celesia* sp., Ewedu, *Corchorus* sp., Igbagba, *Solanum* sp., Maize, *Zea mays*, Tomato, *Lycopersicum* sp., Okro, *Hibiscus esculentus*. Many of the farmers cultivated more than one vegetable crop on their fadama farms. However, about 86% cultivated leaf vegetables and about 60% cultivated maize. About 44% cultivated tomato and only 8% cultivated okro, which are fruit vegetables. About 80% of the respondents were not members of fadama association and only about 20% were members of fadama users associations. This situation cannot enhance effective fadama farming extension. Majority of the fadama farmers cannot at the same time benefit from input and credit supply scheme of Government, which has been on group basis.

Data in Table 2 show that about 46% of the respondents indicated that they work both in the morning and evening while 40% indicated that they only work in the morning in their fadama farms. Also 10% indicated that they work throughout the day in their fadama farms. Mean hours spent on Fadama farms was 5.8 hours daily. Most of the respondents (88%) got their agrochemicals from open market while only 8% got their chemicals from government establishment. Also 64% of the respondent

got their planting seeds from open market and about 42% used seeds from their previous harvests. Only 10% also got their seeds from government establishment and seed supply companies. The low membership of fadama farmers in Fadama Associations might be responsible for the high level of open market patronage for sourcing for seed meant for next planting season. Most (58%) of the respondents received information from their friends and 42% got information from extension agent and only 2% from television. Majority (88%) got no loan for their fadama farm and only 12% received loan for their farms. All the 12% that used loan got the loan from various cooperative societies. The mean income of fadama farmers from the respondents was N20, 687.50. The low income may be due to the deficiencies of fadama farmers in some technical and managerial skills for maximum and efficient use of fadama resources.

Training of fadama farmers and sources of inputs:

Detailed analysis showed that about 66% of the respondents had no training on fadama farming while only 34% had attended one training or the other in fadama farming. Data in Table 2 show that about 56% of the respondents indicated that extension agents were the source of their improved fadama practices while 42% learned improved fadama practices from other farmers.

Table 2: Training of fadama farmers and sources of inputs

Sex	Frequency	Percentage
Period of day, work on fadama farm		
Morning only	60	40.00
Morning and afternoon	3	2.00
Moming and evening	69	46.00
Afternoon and evening	3	2.00
Throughout the day	15	10.00
Total	150	100.00
Source of agrochemicals		
Government	12	8.00
Private organization	12	8.00
Open market	132	88.00
Source of seed		
Government	15	10.00
Private organization	6	4.00
Open Market	96	64.00
Previous harvest	63	42.00
Sources of information		
Television	3	2.00
Friends	87	58.00
Extension agents source of learning	63	42.00
Improved fadama practices		
Other farmers	63	42.00
Extension agents	84	56.00
Radio	3	2.00
Cooperative societies	3	2.00
Posters	6	4.00
Methods of training preferred		
Television	9	6.00
Practical demonstration	99	66.00
Small Plot Adoption Techniques (SPAT)	24	16.00

Source: Field Survey, 2004

Likewise 86% of the respondents were of the opinion that they required trainings in fadama cultivation and 14% indicated that they required no training. Majority (66%) of those who were of the opinion that they required trainings in fadama farming prefer practical demonstration to farmers as best training method, 16% showed their preference in Small Plot Adoption Technique (SPAT). While only 6% showed their preference in television as a training channels where farmers can hear and see fadama farming operations.

Training needs of fadama farmers: Data in Table 3 show the training needs of fadama farmers in order of priority and frequency distribution. Storage of farm produce top the list (94.0%) followed by storage of leavy vegetables (92%), storage of fruit vegetables (90%); use of chemical to control insect pest on fadama farms (88%), use of herbicides on fadama farms (88%); appropriate and dosage of chemical to control insect pest on fadama crop (82%); appropriate and dosage of herbicide to be used on fadama farms (76%) while storage of maize come last on the list (62%). This might be because most of maize produced on fadama farms are sold green and fresh because of high demand and low supply during the dry season when fadama farming thrives well. This show the great-potential of fadama farming in solving food security problems during the dry and scarce period.

Relationship between socio-economic characteristics of the respondents and training needs: Data in Table 4 show the detailed analysis with correlation matrix both at 0.05 and 0.01 significant levels. There was a negative but significant relationship between the training needs of fadama farmers and number of years of formal education ($r = -0.302$). This implied that the less the years of formal education, the more the training needs of fadama farmers. Training need was not significant with any other variable considered in the study as shown in the Table 4.

However, inter-correlation relationships among the variables show that there is also a negative but significant relationship ($r = -0.354$) between the number of years of formal education and size of household of fadama farmers. This implied that as the number of years of formal education increases, size of household, that is, the number of children and dependant relatives decreases. There was a positive and significant relationship ($r = 0.360$) between age and number of hours spent in fadama farms. This implies that as age of fadama farmer increases, they spent more time on their fadama farms. They were never in haste and they took their time to finish the farm operations. This might be because aged farmers may not have any other business than the fadama farming. However, the increase in age cannot be indefinite, the increase will continue until 40.8 years, which is the mean age of fadama farmers sampled. Also, there was a positive and significant relationship ($r = 0.339$) between distance of fadama farms from town and experience of fadama farmers. This implied that as the distance of fadama farmers increases from the towns and cities, their experience in fadama farming also increases. This could mean that those that have spent more time in fadama farming could move farther away from towns and cities where they could get more land for fadama farming and they can afford to transport their produce to markets with less cost.

Table 3: Training needs of fadama farmers in order of priority and frequency distribution

Training needs	Order of priority (Frequency distribution and percentage)
Storage of farm produce	141 (91)*
Storage of leafy vegetables	138 (92)
Storage of fruit vegetables	135 (90)
Chemical control of insect pest	132 (88)
Use of herbicide on fadama farm	132 (88)
Appropriate dosage of chemical to be used	123 (82)
Control insect pest on fadama crops	
Appropriate dosage of herbicide to be used	114 (76)
Storage of maize	93 (62)

Source: Field Survey, 2004, * Percentages in parenthesis

Table 4: Correlation matrix showing intercorrelation between variable investigated

	(1) Years of formal education	(2) Age	(3) Household size	(4) Farm land	(5) Distance of farm	(6) Exp. in fadama	(7) Hours spent in farm	(8) Loan	(9) Income	Y
1	1.00									
2	-0.190	1.00								
3	-0.354*	0.697**	1.00							
4	-0.336*	0.577**	0.393**	1.00						
5	0.178	0.450**	0.215	0.563**	1.00					
6	-0.226	0.647**	0.535**	0.539**	0.339*	1.00				
7	-0.566*	0.360*	0.407**	0.552**	0.171	0.596**	1.00			
8	-0.016	0.129	0.393**	-0.214	-0.223	0.048	-0.227	1.00		
9	-0.543*	0.502**	0.568**	0.553**	0.255	0.486**	0.581**	0.035	1.00	
Y	-0.302*	-0.037	0.179	0.275	0.007	-0.151	0.187	-0.094	0.256	1.00

* Significant at 0.05 level, ** Significant at 0.01 level

Table 5: Result of regression analysis showing relationships between investigated variables

Variable	b	Standardized B	t-ratio
Age	-0.275	-0.481	-1.827*
Years spent in Schools	0.446	0.305	1.052*
Size of household	1.230	0.632	2.437*
Size of fadama farmland	1.245	0.267	1.128*
Experience in fadama farming	0.446	-0.360	-1.728*
Crops cultivated	1.126	0.114	0.707*
Hours spent on farm	1.469	0.567	1.967*
Period of day work on far	-2.038	-0.488	-2.891*
Source of input	-3.057	-0.250	-1.234*
Income	4.430E-05	0.146	0.731*
Formal training attended	7.567	0.567	3.332*
Training method desire	-0.815	-0.204	-0.726*

R = 0.859, R-square = 0.738, Adjusted R-square = 0.465, df = 149, F = 2.704, Significant level = 0.05, *Significant variable

Data in Table 5 show that regression coefficient for age of fadama farmers (b = -0.275) and experiences in fadama farming (b = -0.446) were negative. The result implied that the older the fadama farmers, the less their training needs. This result may be true because of the resistance to change by aged farmers. The younger ones might be inquisitive, wanting to learn more. This finding supports that of Ajayi (1995). On the other hand, experiences gathered over many years of fadama operation might lower the tendencies for training except in the new areas of operation. Also the more the experience of fadama farmers, the less their training needs. This result also may be true going by a popular idiom experience is the best teacher. Experienced fadama farmers must have come across many problems and through trial and error must have provided solutions to the problems. Also they must have gained a lot through interaction with friends and other farmers. The inexperienced ones would show higher affinity for training and willingness to participate.

Data in Table 5 show that regression coefficient for size of household (b = 1.230); size of fadama farm land (b = 1.245); hours spent on farm (b = 1.469) and formal fadama trainings attended before (b = 7.567) were positive while income (b = -4.430E-05) was negative.

The larger the size of household of fadama farmers the more their training needs. This may be true because when the size of household increases, one would be thinking of ways to get enough money and one of such ways is to have additional farm plots, which may necessitate further and training/knowledge. In addition, large family size means increase family labour since hired labours are scarce. The more the size of fadama land, the higher the training needs. This may be true because farmers with large farm would desire high profit and may need training to improve the knowledge to achieve this desire. The more the hours spent on fadama farms, the more their training needs. This may also be true because

they would want to justify hours spent on farm with higher profits and this may only be achieved with more training.

The lower the income of fadama farmers, the more their training needs. This may be due to the desire to increase their income from fadama training and that additional training would provide the knowledge to remove the deficiencies in the technical and managerial skill required for efficient use of fadama resources and earn the desired increase in income.

The more the training attended before, the more the training needs of fadama farmers. This is obvious in that if training attended meet the immediate needs of an individual, that individual would want more training so as to meet future needs.

The t-ratio as shown in Table 5 shows that the following variables had significant relationship with training needs of fadama farmers. This is in sharp contrast to results of correlation matrix. The variables are: age, years spent on formal education (schools), size of household, size of fadama farm land, years of experience in fadama farming, numbers of crops cultivated, hours spent in fadama farm daily, period of the day worked in fadama farm, sources of input, income, numbers of formal training attended in fadama production and training methods desired. These variables should be considered when organizing training programme for fadama farmers. R²-value for all the significant variables is 0.738. This means that significant variables accounts for 73.8% variations in fadama farmers training needs.

Conclusions and recommendations: From the findings of this research, both male and female farmers are involved in fadama farming. Also few aged farmers are involved in fadama farming while few of them planted fruit vegetables and maize. Majority of fadama farmers plant leaf vegetables and required more training in the following areas: storage of farm produce, use and dosage of chemicals for fadama operations. It is important for extension and extension agencies to design training programmes for fadama farmers as it was discovered that the more training attended by these farmers the more they would want to attend. Also more fadama user groups or associations should be formed and strengthened so that members can have access to loan facilities, procurement of other inputs such as chemicals and fertilizers. Fadama farmers could be trained on how to select and preserve seeds for the next planting seasons as another way of empowering them. Training of the farmers in the preparation and uses of organic fertilizer on fadama farms would not only empower the farmers economically in terms of increased yield and increased income, it would

also improve the soil structure through regeneration process and produce from such farms will be free of toxic compounds that can cause health problems.

Variables such as sex, age, years spent in formal school, size of household, size of fadama land, farmers experience, income, sources of inputs should be highly considered when organizing, planning and evaluating trainings for fadama farmers for the training to be effective and efficient.

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