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Factors Influencing Cultivation of the Lilongwe and Linthipe River Banks in Malawi: A Case Study of Salima District

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Abstract: The study was conducted to investigate factors that influence farmers to cultivate along the river banks in Salima District, in the Central Region of Malawi. Using logit analysis the study revealed that household size, main occupation, education market availability and land holding size were important parameters in influencing the farmers to engage in river bank cultivation. Basing on these results it has therefore been suggested that since these farmers cultivate along the river banks without conserving the soils, a livelihood approach must be adopted. This approach will enable farmers to sustainably derive their livelihoods from the land which supports their livelihood without degrading the environment.

Key words: Adoption, river bank cultivation, sustainable livelihoods, logistic regression, Malawi, small holder farmer

INTRODUCTION

Agriculture remains the mainstay of Malawi's economy contributing about 40% of the Gross Domestic Product (GDP), 87% of the total employment, more than 90% of the foreign exchange earnings and supplies more than 65% of the manufacturing sector's raw materials. The food self-sufficiency policy has therefore guided almost all major agricultural programmes, strategies and action plans. Despite these efforts, in 2006, the government noted that poverty remains widespread and severe (65%) while food insecurity and land degradation have worsened (Anonymous, 2005a; UN Report, 2006).

Irrigation is one of the ways the country is using to achieve food security. And according to Anonymous (2001) most of the land under irrigation is along riverbanks. Therefore, the increase in irrigated land area has increased the sediment load in the rivers due to poor agricultural practices. More often promotion of these well intended technologies has been done without emphasis on complementary improved land and water management practices. Therefore this has meant a progressively reduced productive capacity of the land hence worsening food insecurity and negatively affecting the performance of the national economy.

With this then the Ministry of Agriculture is now aiming at promoting and accelerating broad sustainable agriculture and irrigation development programmes, so as to promote economic growth and contribute to food security and poverty reduction (Mulenga, 2004). To this effect, farmers are encouraged to cultivate along the river banks. This is because the banks tend to have some residual moisture as compared to upland fields (Peters, 2004).

Despite the efforts made by Government and NGOs to improve food security and increased cash incomes through irrigation practices along the river banks, there are also some factors that are influencing farmers' decisions to cultivate along the river banks which are not known. Therefore, the study was aimed at investigating factors that influence farmers to cultivate along the river banks of Lilongwe and Linthipe so as sustainably utilise the river banks in order to improve their livelihoods. Salima district was chosen because Lilongwe and Linthipe rivers pass through the district hence data for the two rivers were easily obtained from the district which was therefore cost effective.

MATERIALS AND METHODS

Primary and secondary information were used in the study. A survey was conducted in Salima district in using a structured questionnaire. A reconnaissance survey was conducted to establish number of households that have gardens along the river banks of Lilongwe and Linthipe. A stratified sampling procedure was used to draw the

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sample and Proportional Probability Sampling (PPS) was used to determine the number of households interviewed (Edriss, 2003). A total of 164 dimba farmers and 100 non dimba farmers were interviewed. Dimba is land which is bordering a river and where cultivation during dry season mainly depends on residual moisture. Therefore, in this study dimba farmers refers to farmers that do cultivate along the river banks while non dimba farmers are those that do not cultivate along the river banks.

The data collected in the survey mainly included: Age of household head, sex of household head, size of household, education of household head, access to credit of household, occupation of household head, extension delivered to household, land holding size, government interventions, status in society of household head. The data for the two groups were compared to find out significant differences in the socioeconomic variables.

The socioeconomic variables were analysed using logistic regression model (Gujarat, 1998). The dependent variable was dichotomized with a value 1 for a dimba farmer and 0 for non dimba farmer. The independent variables included age of household head, sex of household head, size of household, education of household head, access to credit of household, occupation of household head, extension delivered to household, land holding size, government interventions and status in society of household head. Farmers whose villages were along the rivers were purposively sampled as they had river bank garden.

The model was specified as follows:

Y = f(HHSZ, SXHHD, AGHHD, EDHHD, LNHDSZ, MZPR, AGREX, GVINT, STHHD, ACCR, MKTAV, OCCHHD)

Where:

Y = Dimba or Non Dimba farmer (0 = Non dimba, 1 = Dimba)
HHSZ = Size of household (number of members)
SXHHD = Sex of household head (0 = female, 1 = male)
AGHHD = Age of household head (No. of years)
EDHHD = Education of household head (No. of years in school)
LNHDSZ = Land holding Size (No. of hectares)
MZPR = Maize production (kilograms)
AGREX = Agriculture extension (0 = no visit by agricultural extension worker, 1 = visit)
GVINT = Government interventions (0 = No government interventions, 1 = interventions)
ACCR = Access to credit of household (0 = No access to credit, 1 = access to credit)
STHHD = Status in society of household head (0 = no position in the society, 1 = hold position)
MKTAV = Market availability (0 = no market available, 1= market availability)
OCCHHD = Occupation of household head 0 = non farm activities, 1 = farm activities)

AGHHD, EDHHD, LNHDSZ, MZPR and HHSZ were entered in the model as dummy variables whilst OCCHHD, SXHHD, AGREX, GVINT, ACCR, MKTAV and STHHD were entered as dummy variables.

RESULTS AND DISCUSSION

The logit model is significant at 1%. And the-2 log likelihood function is 290.143 indicating that the regressors are adequately explaining the dependent variable hence the model fits the data. The coefficients of the factors influencing river bank cultivation (Table 1).

Household size and main occupation highly influenced decision to cultivate along the river banks ($p<0.01$). Education and market availability were significant and land holding size at in Table 1.

Household size: Household size was found to positively influence people to engage into riverbank cultivation ($p<0.01$). Other results from the same study show that dimba farmers had a higher percentage of families with the bigger household size of 7 to 11 members (Table 2) and the mean household sizes for dimba and non dimba

Table 1: Logistic regression coefficients of the factors influencing river bank cultivation

Variables	Coefficient B	Standard error	Wald statistics
HHSZ	0.257	0.080	10.381***
SXHHD	0.352	0.334	1.110
AGHHD	-0.009	0.008	1.183
EDHHD	-0.150	0.049	9.217**
LNHDSZ	0.025	0.014	3.239*
MZPR	0.000	0.000	1.644
AGREX	-0.002	0.006	0.093
GVINT	0.014	0.016	0.810
STHHD	0.040	0.045	0.798
ACCR	-0.004	0.005	0.630
MKTAV	0.018	0.006	8.527**
OCCHHD	1.393	0.385	13.054***

***: Significant ($p<0.01$)| **: Significant ($p<0.05$), *: Significant ($p<0.1$), -2 Log likelihood 290.143

Table 2: The percentages of the dimba and non dimba households in the different household sizes

Size of household (mean number of members per household)	Households dimba non (%)	Households dimba (%)
1-3	32	24.4
4-6	62	51.3
7-11	6	24.4

Table 3: The percentages of the dimba and non dimba household heads that had spent the different number of years in school

No. of years spent in school by household heads	Non dimba households (%)	Dimba households (%)
1-4	51	74
5-8	45	21
9-12 (post primary)	4	6

Table 4: The percentages of the dimba and non dimba household heads that have the different land holding sizes

Land holding size (ha)	Non dimba households (%)	Households dimba (%)
<0.5	39	22
0.5-1.0	34	31
1.1-2.0	19	21
>2.0	7	20
Don't know	1	7

farmers were 5.04 and 4.40, respectively. Anonymous (2005b) as household gets larger, household members share the same amount of resources, thereby reducing their per capita expenditure. Results seem to suggest that those with larger household and who require more resources engage in dimba cultivation to supplement their cash income.

Level of education of household head: River bank cultivation was found to negatively relate to education level of household head and was statistically significant. As can be noted from Table 3, more household heads of dimba farmers spent fewer years in school than non dimba farmers. In the same study, it was found that household heads of non dimba farmers preferred to engage in non farm activities such as teaching, *Ganyu* (casual labour), selling of *Zipapati* or *Chilambe*, (ropes), selling of charcoal/firewood, weaving, brick moulding and *dampa* (business in which bicycles are used for transporting people as well as goods).

As was noted by Chilimampunga (2006) poor human capacity is one of the major hindrances to improved agricultural productivity; Illiterate farmers slowly apply modern methods of farming. In this case, it could be suggested that the less educated and who cultivated in the river banks could not take up advice not to cultivate in those areas. Results could also mean that the less educated had less access to non-farming income and therefore resorted to cultivating along the river banks.

Land holding size: The land holding size was found to positively influence one to go into riverbank cultivation ($p< 0.1$). Thus, the dimba farmers with larger land holding sizes are the ones who are involved in river bank cultivation unlike the non dimba farmers. Approximately 20% of the Dimba farmers have land of more than 2 h (Table 4), which is higher than the national average of less than 0.7 ha per household (Anonymous, 2004). From the same study it was observed that a good portion of those who did cultivate along the riverbanks did so because of having no access to land along the river. More studies are needed to find out how land is acquired and how it is possible for the less educated dimba farmers, with larger farm families to acquire land along the river banks.

Market availability: The majority of the respondents (69.3%) of the respondents stated that there is ready market for dimba maize along the Salima road. In the same study it was found that a high percentage (71.6%) of the respondents stated that the dimba maize is sold as green because this form fetches more money as compared to selling it dry. Availability of market for the produce was statistically significant at 0.05% and was found to positively influence people to engage in river bank cultivation. This is in contrast to some countries in Southern Africa and some places in Malawi where maize cultivated in dimba areas is harvested dry to supplement maize stocks between January and March when families are likely to run out of food (Kasomekera and Wiyo, 1994).

Occupation of household head: Occupation of an individual has a positive influence on one to become a Dimba farmer and is statistically significant at. In the same study, it was found that 89% of the house holds heads for dimba farmers engage in farming activities as their main occupation as compared to 72% for the household heads for non dimba farmers. As noted earlier, non dimba farmers are engaged in non farming activities which include teaching, *Ganyu*, selling of *zipapati* or *chilambe* (ropes), charcoal/firewood selling, weaving, brick moulding and *dampa*. It should be noted that the high dependence on farming for the dimba farmers is a common feature for the Malawi population where 80% (Kishindo, 2006), or over 90% of the rural labor force is directly engaged in agricultural activities (Chilimampunga, 2006).

Problems with river bank cultivation in Salima: Although river bank cultivation is one of the ways of achieving food security in the country, there are problems associated with this practice. Most of the farmers are cultivating along the banks of Lilongwe and Linthipe Rivers without conserving the soils resulting in soil erosion which leads to flooding, siltation, land slides and loss of arable land. In general, farmers lack trees like *Acacia galpini*, *Acacia polycantha*, *Faidherbia albida*, shrubs like *Sesbania sesban* and grass like vetiver, napier that can be used for river bank protection hence this is also attributing river banks being prone to soil erosion.

CONCLUSIONS

The results have shown that house hold size, level of education, land holding size, market availability and main occupation influences people to engage in river bank cultivation. River bank cultivation is likely to cause siltation due to erosion. Siltation is also likely to negatively affect production and breeding of some fish species such as mpasa, *Opsaridium microlepis* which migrates from Lake Malawi to Linthipe River for breeding and which require clean gravel substrate for spawning (Berkman and Rabeni, 1987).

It is important therefore, that policies to curb problems associated with riverbank cultivation should take a livelihoods approach that considers household size, land holding, markets and occupation of members of the community as well as environmental degradation. In Malawi, river banks are the most vulnerable land areas and have long been cultivated due to fertility from sediments deposited by regular flooding.

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REFERENCES

Anonymous, 2001. Status of Environmental Report 2000. Dep. Environ. Affairs, Lilongwe, Malawi.

Anonymous, 2004. Guide to agricultural production and natural resource management. Ministry of Agriculture and Food Security. Lilongwe, Malawi.

Anonymous, 2005a. Second integrated household survey. National Statistical Office, Zomba, Malawi.

Anonymous, 2005b. HIV and AIDS monitoring and evaluation report. Follow up to declaration of commitment on HIV and AIDS. Lilongwe.

Berkman, H.E. and C.F. Rabeni, 1987. Effect of siltation on stream fish communities. Environ. Biol. Fish., 18: 285-294.

Chilimampunga, C., 2006. The impact of rural urban migration on house/hold food security in selected villages in chiradzulu and mangochi district. Africa Research Series No. 12. Current Issues of Rural Development in Malawi, pp: 93-94.

Edriss, A., 2003. A Passport to Research Methods. (Research Skills-Building Approach). Int. Publishers and Press (IPP), Las Vegas.

Gujarat, D.N., 1998. Basic Econometrics. 2nd Edn. McGraw-Hill Company, New York.

Kasomekera, Z.M. and K.A. Wiyo, 1994. Study of dambo farming communities in Malawi (cash or subsistence farming). Bunda college of agriculture, lilongwe, Malawi.

Kishindo, P., 2006. Dynamics of land tenure: A village case study. Current Issues of Rural Development in Malawi. Afr. Res. Series, No.12.

Mulenga, N.J., 2004. Land and Water Management in the SADC Region, Malawi Country Situation Analysis. In: Regional Situational Analysis, Land and Water Management in the SADC Region, Mapiki, A. and C. Nhira (Eds.), Workshop Proceedings, No. 1. SADC Secretariat. Gaborone, Botswana, pp: 35-46.

Peters, E.P., 2004. Informal irrigation in malawi's lake chilwa basin: Stream bank and wetland gardens project on institutional dimensions of water policy reform in malawi: Addressing critical land-water intersection in broadening access to key factors of production. Final research report of the basis crsp. Jfk school of government, harvard university, USA.

UN Report, 2006. World Poverty Profile. United Nations, Geneva.