

Socio-Economic Factors Influencing Small Scale Farmers Livelihood And Agrodiversity.

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A study was carried out in PLEC sites of Arumeru, Arusha, Tanzania to evaluate socio-economic factors that influence farmer's livelihood and agrodiversity. Guidelines outlines in PN & V 13 on-organisational aspects were applied. Cashflow analysis was also carried out to monitor farmers liquidity situations during different times of the year. Data was analysed using the SPSS statistical package. Mean farm size was lowest in sub-humid Olgilai (2.9 ones) and highest in semi-arid Kiserian (12.6 acres) and was decreasing with time. Farmers in Olgilai had the greatest number of support plots to the homestead farm. Semi-arid Kiserian also experienced food shortage compare to sub-humid Olgilai/Ngïresi. Greatest expenditure was on-family needs. Cashflows were higher from off-farm activities for average farmers in semi-arid site with a peak in January. July to October was highest in income from crops while November and February were peaks for income from livestock. November & December were peak in cash income from crops in sub-humid zone.

Income expenditure in crop and livestock production was highest in March and may for sub-humid and February to April in semi-arid zone. The result suggest that July to October are favorable months a farmer has surplus money that he can invest in Agriculture inputs. Population pressure and droughts were observed to negatively influence food security and farmers' livelihood and agrodiversity for both sites.

Introduction

Organizational diversity, often called the “socio-economic aspects” includes diversity in the manner in which farms are owned and operated, and in the use of resource endowments. It underpins and helps explain management diversity and its variation between particular farms. Explanatory elements include labour, household size, diversity in resource endowment of households, and reliance on off-farm employment. Also included are the age groups and gender relations in farm operations, dependence on the farm as against the external sources of support, the

spatial distribution of the farm, and differentials between farmers in access to land. This paper discusses how socio-economic aspects influence agrodiversity and livelihoods of small-scale farmers, in the two distinct PLEC sites of Arumeru district.

Methodology

PLEC Approach was used with some additional participatory socio-economic approaches in conducting this study. Some of the participatory tools (Mafuru J. *et al*) which were adopted for organizational diversity analysis included Cash flow analysis (income and expenditure recording by farmers), with the objective of monitoring liquidity situation of various farmer categories. Feedback meetings were organized to discuss farmers own recorded findings. Additional data were collected through both informal and formal surveys. Crop market prices monitoring was also done in order to analyze local market opportunities for various crops grown by farmers in the district.

Results and discussion

Household characteristics of PLEC farmers

Farmers that are working with PLEC were those who volunteered by themselves. Farmers were grouped into three resource endowment categories mainly rich, average and poor.

Trend in average farm size ownership per household by village and zones

Table 1. Farm size ownership per household (N = 34)

Zone	Village	Mean farm size (acres) in a year	
		1988	1999
High altitude	Ngiresi	4.8	2.8
	Olgilai	2.9	2.8
Low altitude	Kiseriani	12.6	6.9
	Sig. (0.05)	0.49	0.02

Source: survey, 1999/2000 season

There had been decreasing trend in farm size ownership per household for both sites. Generally farm size indicated a decreasing trend from 1988 to 1999. Average farm size owned by households in low altitude zone was significantly higher than in higher altitude in 1999 (Table 2). According to key informants a decreasing trend in average farm size per household was a reflection of population pressure increase overtime due to increase in family size, and in-migration in both sites.

Forage resources availability and use

Table 2: Main sources of forage for livestock (cattle) by livestock owning households (N=30)

Major sources	Response from farmers (%)			Total(%)
	High altitude		Low altitude	
	Ngiresi	Olgilai	Kiseriani	
Homestead	16.7	23.3	3.3	43.3
Distant support plots	3.3	6.7	9.4	19.4
Communally owned land	3.3	Nil	34	37.3
(%) Totals	23.3	30.0	46.7	100

Source: survey, 1999/2000 season

Table 2 indicates the response of sample farmers in relation to main sources of forage for livestock particularly cattle obtained from different areas. Pasture in homesteads was typical for farmers from high altitude and low altitude farmers obtained pastures mostly from communal lands. Contribution from support plots was relatively lower.

Land ownership and use intensity

Table 3. Mean number of farm plots per Household in 1999 (N=34)

Zone	Village	Plots/Household	Size (0.05)
High altitude	Ngiresi	2.6	0.004
	Olgilai	3.3	
Low altitude	Kiseriani	1.8	

Source: survey, 1999/2000 season

Number of farm plots per household was found to be significantly higher in high altitude zone (Olgilai) than in low altitude zone (Kiseriani) with mean size of 3.3 and 1.8 plots respectively (Table 3). This can also be an indicator of land pressure and/or scarcity, in relation to human population, whereby one may own many small and scattered plots of land in a given location in response to land scarcity (Ngiresi and Olgilai) where clan inheritance is the common mode of land ownership.

Household food shortage (food insecurity) as perceived by farmers

Table 4. Households experiencing food shortage by zone (N=29)

Zone	Village	Response (%) Household		Total (%)
		Food shortage HH	Non-food shortage HH	
High altitude	Ngiresi	27.3	0.0	27.3
	Olgilai	27.3	3.0	30.3
Low altitude	Kiseriani	42.4	0.0	42.4
Total		97	3.0	100

Source: survey, 1999/2000 season

About 97% of farmers experience food shortage in a year 42.4% of which come from semi-arid Kiseriani (low altitude zone) and 27.3% each from Ngiresi and Olgilai

respectively (in sub-humid zone). However farmers indicated that food shortage is most felt from planting time to harvesting period. Only a few indicated to have food shortage throughout the season especially in low altitude zone. Almost all sample farmers in both zones, had mentioned buying/purchasing as a common immediate measure for food shortage among households.

3.5 Average Household Cash Flow analysis from 1999/2000 / 2000/2001 seasons

A total of 17 farmers fully participated in recording daily cash income and expenditures in high altitude zone (11 from Olgilai, 6 from Ngiresi). Among the participating farmers 2 were from lower class, 6 from upper class and 9 from middle class.

In low altitude zone (Kiserian) a total of 13 farmers were involved, amongst them 3 were from lower class, 3 from higher class and 7 from middle class. Only complete data on cash flow for lower class were available from low altitude zone.

The analysis showed that on average cash inflows were higher from off-farm activities for average farmers class in semi-arid zone reaching peak in January. Cash income from crops sources were highest from July to October whereby from livestock were highest in February and November. However in high altitude zone for the average farmers both off farm and cash income from crops were important while other cash sources apart from crops and livestock were almost not important as opposed to low altitude zone.

Cash income (inflow) from crops and livestock were important sources for rich farmers in low altitude Kiserian (Appendix 1). Off farm and other sources of cash income were the least except for crops which rose in October, in which month also crop and livestock sources were highest. For the same social class in high altitude zone (Appendix 2), off farm cash income sources were important. Crop sources were also important reaching the peaks in November and December.

Off farm and other sources were the main cash income sources for lower class in low altitude zone especially from September to January.

With regard to cash outflow (expenditure), cash expenditure on family needs had been the main cash expenditure across social classes and agro-ecological zones.

Cash outflow for investment in crops and livestock production were also important for upper class in high altitude zone (Appendix 3), with peaks in March and October respectively. For the same social class in low altitude zone (Appendix 4) cash expenditure for crop production rose only from February to April. Cash expenditure for miscellaneous (other than for livestock, crops and family) were important in September to December.

Investment for crop production was the least cash outflows for medium class in low altitude zone. In high altitude zone, for the same social class least investment was revealed for both crop and livestock production.

Generally the cash expenditure pattern on investment in livestock and crop production for lower class was not very different from that of medium class being characterized by low level of cash investment (outflow) for crop and livestock enterprises.

3.6 Crop local market opportunity and risks

In order to analyse the market opportunity and risks for various crops grown in both agro-ecological zones, crop market prices for various crops were monitored on monthly basis at various local markets. Chekereni local market was the common local market for various crops grown in the two agro-ecological zones.

Analysis reveal that Irish potato and banana (Ng'ombe variety) had lowest market risks due to relatively low price variability compared to other field crops (Appendix 5). Though beans is the most important crop it had relatively higher market risk. Maize and other types of banana had lower market risks. For horticultural crops cabbage had relatively high market risks while tomato onion and amaranths had

low market risk. However, market risks for Irish potatoes, Amaranths and tomato which were sold in packed units, might be masked by varying pack size while maintaining selling price.

3.8 Other land resource use and management

3.8.1 Traditional natural resources tenure system and management of the two tribes (Waarusha and Wameru) in Arumeru district

Traditionally land tenure is not different for the two tribes. Land is inherited from fore grand fathers to children. The inherited land is controlled by the head of the family because the land is given/distributed to each family especially the head of the house men/women for the case of a woman who is not married or divorced under the condition given to them. Using by laws any one who misuses the land, it is taken and given to the member of the family.

Due to shortage of land in the District members of the family could buy the land within the area or from other areas in the Districts, that became a personal land with his family. During the purchasing of land both parties of the family should play part in coming into the agreement, both being supervised by the head of family and clan. That was done in order to avoid any conflict which might rise at any time.

3.8.2. Forests

Forest land is normally gazetted and owned by the central or local government. The areas like Meru forest are the property of central government being supervised by the Forest Department with its laws governing that area. The land in a certain level where trees like pines, eucalyptus and gravellia a planted on commercial basis. In this areas villagers who live around were allowed to grow some crops like maize, beans and vegetable under given agreement.

3.8.3 Water sources tenure

Management and protection of water sources is either by the district council, village government, Water scheme committee, collective water users, or private water users

like Tanzania National Electric Supply Company. They establish by-laws that govern the use of water sources.

4.0 Discussion

The results reveal generally that socio-economic factors have diverse implications on agrodiversity and farmers' livelihood. Factors such as accessibility and use of capital (cash), land (farm size per household), struggling against seasonal food insecurity, response to market forces and off-farm opportunities are the major influencing factors on agrodiversity status in the agroecological zones which in turn affect farmers livelihood. Except for rich farmers, average and poor farmers spend very little of cash for investment in crop and animal production. Low investment in crop production, especially for non-labour inputs has an impact on soil productivity and thus affecting agrobiodiversity.

Low yields and financial inability to purchase enough food throughout the year creates food insecurity and adversely affects peoples livelihood. To meet family needs, farmers do make choices on crops to grow and enterprises to undertake (on-farm or off-farm) and livestock (number and species) to keep. Horticultural crops and off-farm labour were farmers common options. Market forces also had a role of influencing which type of crop to grow.

Access to land coupled with population increase (family size and in-migration) influence the type of agrodiversity on-farm. Farmers opt either to emigrate, or intensify production per unit area besides diversifying to spread risk especially under drought prone semi-arid environments.

Increased role of off farm activities such as selling labour, part-time wage employment, petty trading, especially for poor and average farmers with less access to land and other necessary resources, signify how farmers respond to a decreasing ratio of farm size to household, in the both agroecological zones. In fact, there is an inverse relationship between non-farm employment and farm size (FAO, 1988). Non farm activities are particularly important for those rural households with very small

holdings or little or no land as such employment evens out the sharp drops in monthly and income earning patterns of rural households

5.0 Lessons learnt:

Low levels of cash investment for agricultural production have potential negative effects on agrodiversity.

Farmers respond to market forces that in turn influence the crops and other enterprises farmers choose to work with, which in turn affect agrodiversity (e.g. Flower farming in the low altitude zone)

Off-farm employment/activities are increasingly becoming important especially for low and medium social classes which have implications on agrodiversity and rural livelihood in general.

There is still a trend of decreasing ratio of owned farm size to household, due to human population increase (family size and in-migration) which create varied concerns on agrodiversity.

Coping strategies against the household seasonal food insecurity frequently facing farmers have potential influence on farmers' decision making on allocation and management of available resources, which will have implication on agrodiversity at large.

6.0 Recommendations

Sustainable technologies should be developed to make farmers cope with problems associated with population pressure and droughts. These technologies should also enhance biodiversity which by itself is a risk aversion strategy especially for the poor.

Strategies for a wider dissemination of developed technical interventions should be laid down, which should involve important stakeholders in natural resource management.

Further studies on potential role and or effects of off farm employment/activities on natural resource use management (agrodiversity) need to be emphasised, along with monitoring of household level population dynamics.

Market infrastructures and information for agricultural produce and inputs are important for the farmers to make rational decision on choices of type of crop, enterprises and/or production method (technology) to use.

Policies should be redirected in emphasis on making use of potentials of traditional ways of resource management and use to ensure positive effects on agrodiversity.

References:

FAO (1988), The Impact of Development Strategies on the Rural Poor: Second Analysis of Country Experiences in the Implementation of WCARRD Programme of Action

Mafuru J, Mwalukasa E.E. and Meerendonk H. (1999), Client-Oriented Research Methodology Combining Livelihood Systems and Commodity Sectors

Figure 1. Household cash In flow for upper class in low altitude (Kiseriani)

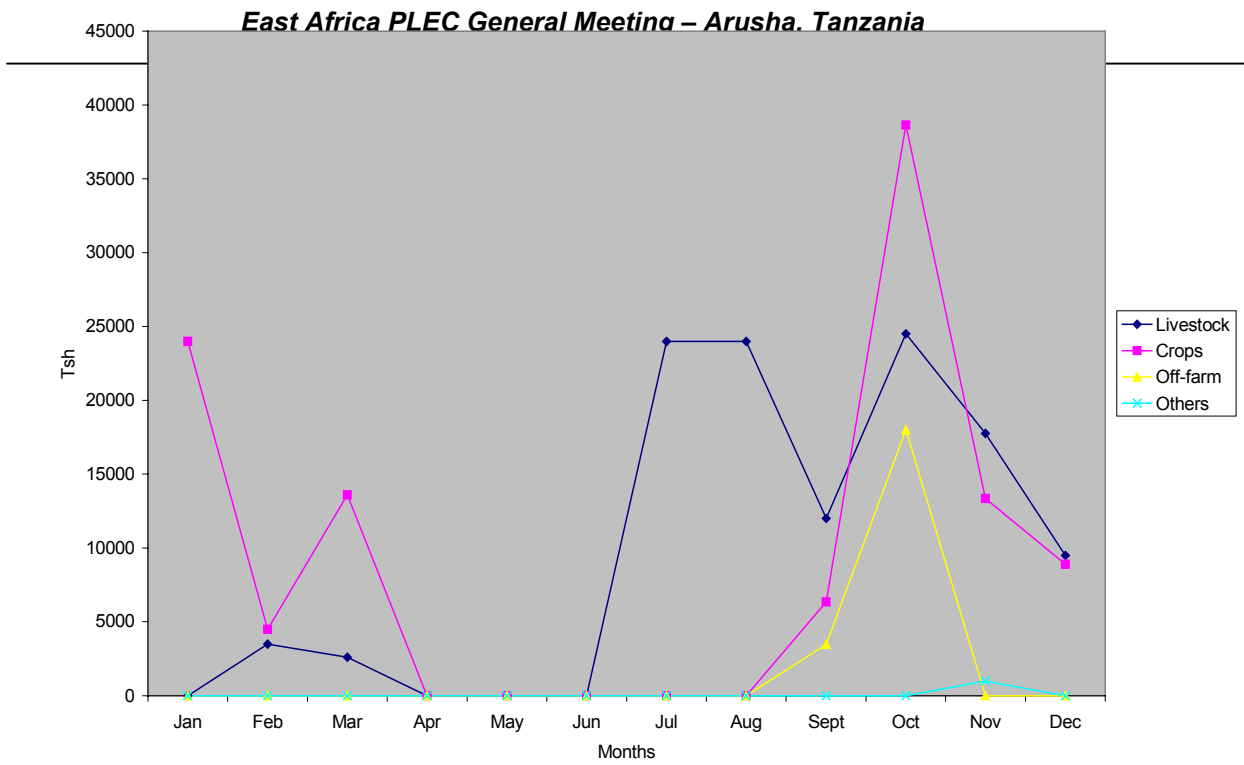


Figure 2. Household cash inflows for upper class in High altitude (Olgilai and Ngiresi)

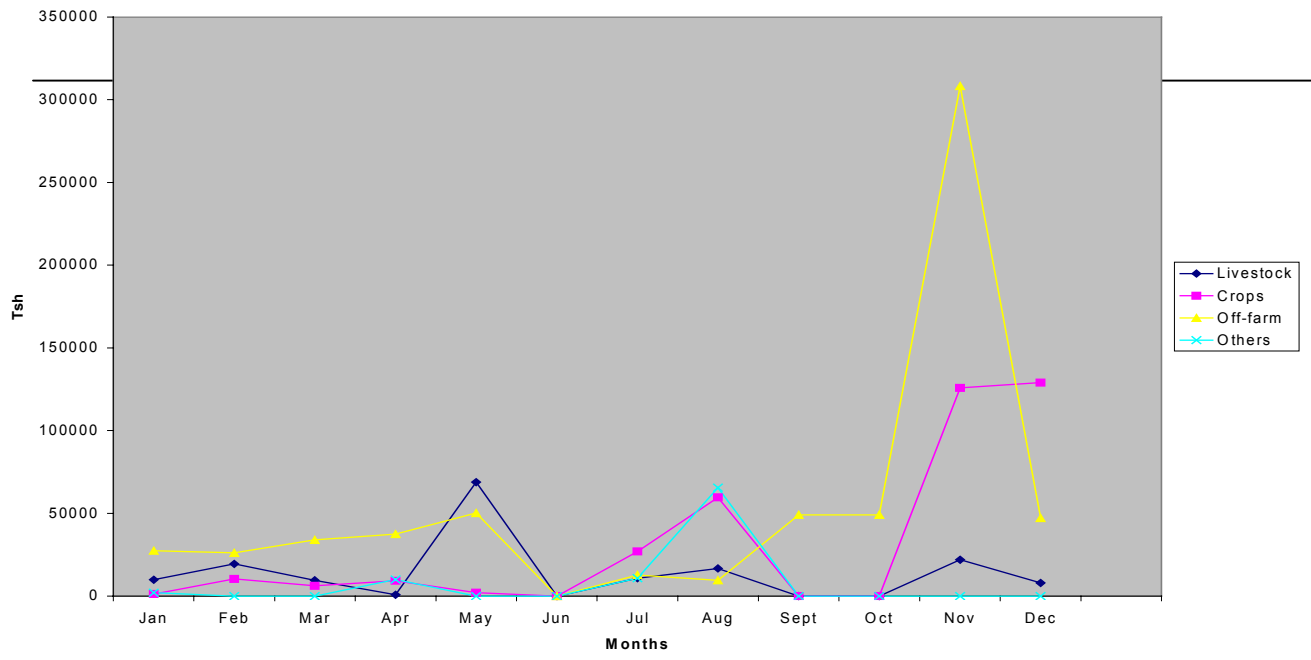


Figure 3. Household cash outflows for upper class in (High altitude)

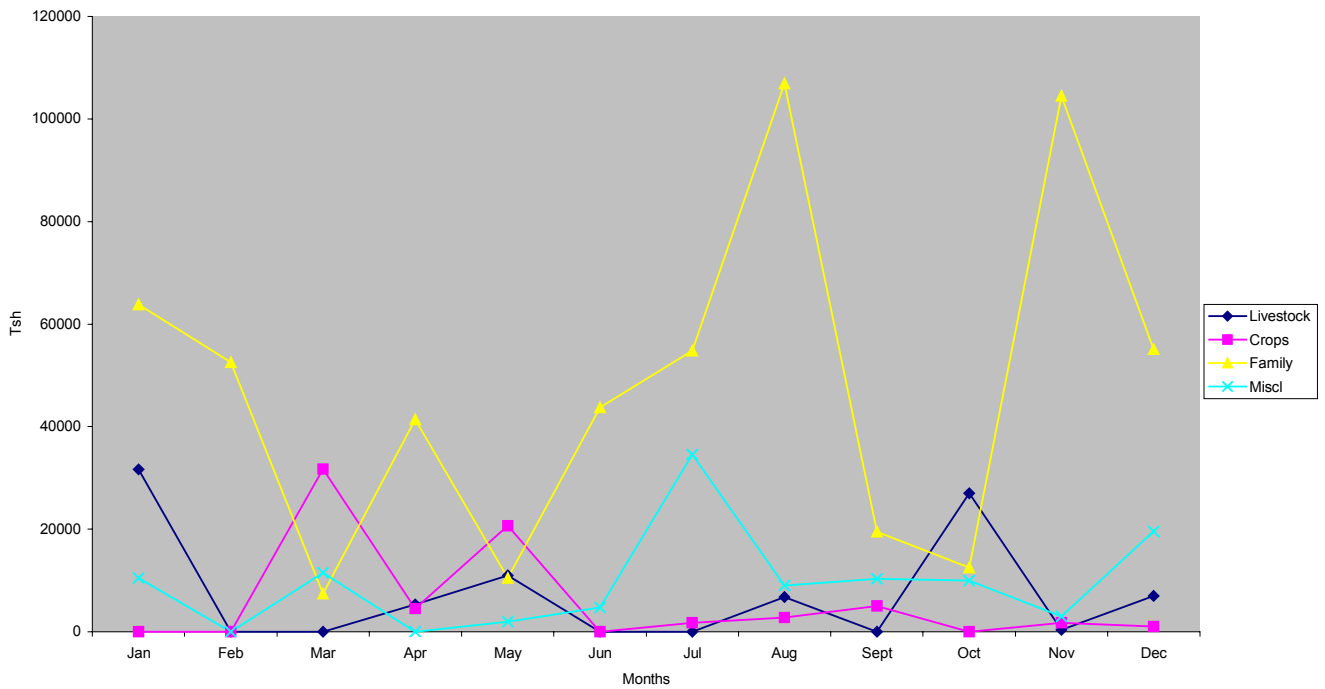


Figure 4: Household cash outflows for upper class in Low altitude (Kiseriani)

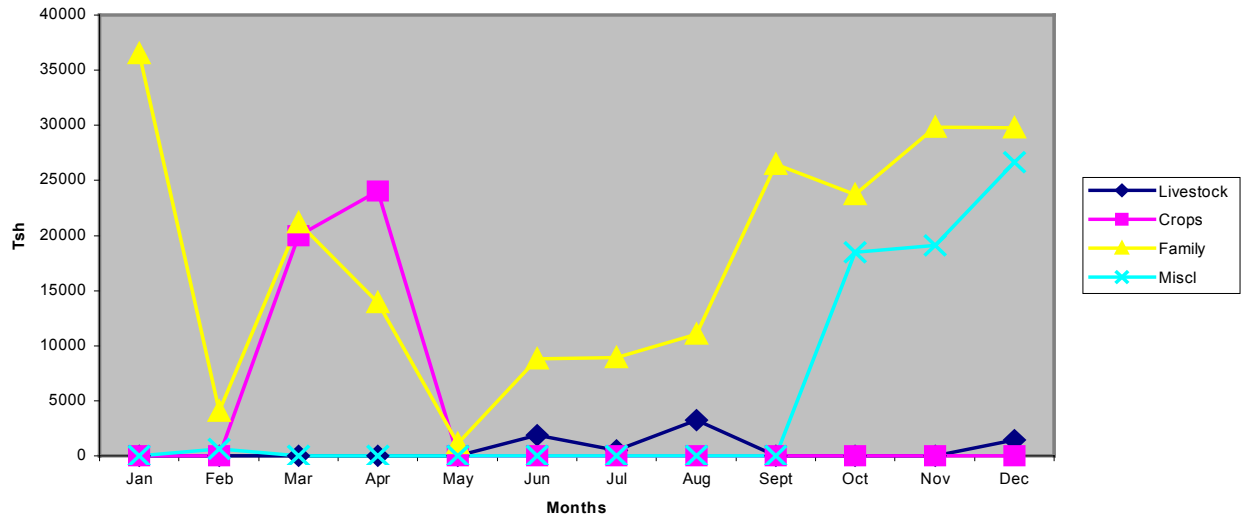


Figure 5. Average monthly market prices for various field crops at Chekereni - 2000/01 season

