Sunflower Production and Livelihood Outcomes Sustainability Among Smallholder Farmers' Households in Iramba District, Tanzania

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PhD. Moshi Co-operative University, 2018

Abstract

The study was accelerated by the fact that sunflower production was an important economic activity which has potential to improve the household livelihoods of smallholder farmers. However, the potentials seem not to be exploited by households and its impact on livelihood outcomes among smallholder farmers was hardly ascertained. Thus, this study mainly aimed to analyse the impact of sunflower production on livelihood outcomes among households of smallholder farmers. Specifically, the study aimed to:

- Determine the levels of livelihood outcomes
- Examine the contribution of sunflower production on livelihood outcomes among households and
- Assess the influence of socio-economic factors on livelihood outcomes sustainability among households

The study was guide by the Sustainable Livelihood Approach which enhances understanding of the livelihoods of poor households. Unlike other approaches to livelihood, the SLA was a multidimensional, integrated and rational approach to poverty eradication. The approach provided the key component for analysing livelihoods of individuals and their communities in terms of capital assets, vulnerability context, the transforming structures and processes, livelihood strategies and livelihood outcomes as the key elements. The SLA contextualises the livelihood to be people centred and focuses on improving their livelihoods in terms of satisfying cultural, social, economic and environmental needs and aspirations of present generations without undermining the ability of future generations.

Likewise, the study used the theory of participative behaviour (theory of margin) basically for understanding adults' lives when participating in different socio-economic activities. The study qualified the parameters of the theory in terms of margin, load and power which influence individual motives to participate in socio-economic activities. Margin was explained as a function of the relationship of load to the power. Load was also defined as the self and social demands by a person to maintain a minimum level of autonomy while power is described as resources such as abilities, possessions. The theory was built on the assumption that being an adult means facing continuous growth, and change, in which constant effort must be made to participate in different socio-economic activities for meeting normal living responsibilities. Hence, participation is a function of the efforts that a person can command over and above which is required for the purpose of maintaining a minimum level of living.

The study adopted the Positivism (Postpositivist) Philosophy which was related to the philosophical stance of the natural scientist, which also refers to the use of principles of scientific methods and models within research to study a philosophical problem by examining causes that influence outcomes. The positivist paradigm stress that real events can be empirically studied and explained using logical analysis and scientifically validated models by experimentation or testing to prove or disprove hypothesis. Thus, the problems studied by post positivists reflects the need to identify and assess the causes that influence outcomes.

The study adopted a cross-sectional research design, but it was guided by a mixed methods approach. The sample size was 368 respondents including sunflower and non-sunflower

smallholder farmers. Systematic sampling technique was used to obtain respondents. Data were collected through a household survey to 368 respondents using a structured questionnaire. Also, a total of 7 key informant interviews and 5 focus group discussions were conducted for collecting qualitative data. Analysis of qualitative data was done through constant comparison technique whereby data were transcribed, categorised, coded and thereafter grouped into themes objectively. The analysis of quantitative data involved the use of descriptive statistics, t test, difference in difference, eta squared statistic, multiple regression and propensity score matching. A livelihood outcome index and a livelihood outcomes sustainability index were developed and used for measuring livelihood outcomes and livelihood outcomes sustainability respectively.

The findings regarding levels of livelihood outcomes among households of smallholder farmers indicated that:

- Sunflower smallholders' households had high levels of livelihood outcome compared to households of their counterparts.
- The results indicated that 54% of households of sunflower smallholder farmers had high livelihood outcomes compared to their counterparts' households whereby the majority (67%) had low livelihood outcomes.
- Livelihood outcomes among participants and non-participants smallholder farmers in sunflower production did not differ.
- Further, a paired sample t-test was conducted and the results showed that there was a significant difference in the scores before and after sunflower production ($t = 10.3$; $p = 0.000$).
- Through participating into sunflower related activities smallholder farmers in sunflower production do not differ. Difference in difference estimation was conducted and the results showed that there was a significant difference ($p = 0.000$) between the households' livelihood outcomes with a positive coefficient (0.087). As a result, the null hypothesis was rejected.

Regarding the contribution of sunflower production to households' livelihood outcomes, the study found that

- There was a significant contribution of sunflower production on the livelihood outcomes among smallholder farmers' households.
- The considerable differences on the average effect of treatment on the treated were depicted by $MD = 1.525$; $t = 10.03$ for household assets index and $MD = 220845.07$; $t = 2.59$ for household total savings.
- Through nearest neighbour matching technique, it was further found that sunflower production had an impact on smallholder farmers households' livelihood outcomes as observed by the significant contribution to the ownership of household assets ($p = 0.000$) and total cash savings ($p = 0.000$).

The null hypothesis that participation in sunflower production has no contribution on smallholder farmers' household livelihood outcomes

- The smallholder famers' households (54%) fell under low livelihood outcomes sustainability status. This implies that smallholders' households with lower level of livelihood outcomes sustainability did not generate enough abilities (such as household income and assets) to enable them withstand future livelihood shocks and stresses basing on vulnerability context.

- Some households of smallholder farmers (16.9%) were categorised into high level of livelihood sustainability. This implies that some households with high level of livelihood outcomes sustainability had chances to withstand livelihood shocks and address household needs since they generated better abilities from their economic activities.

On socio-economic factors influencing household livelihood outcomes sustainability, it was found that:

- Among the socio-economic factors influencing livelihood sustainability, household size, household head education, household asset index and total household savings were significant ($p < 0.05$) while household head sex and household head age were not significant ($p > 0.05$). Thus, household size, household head education, household asset index and total household savings had a significant influence on livelihood outcomes sustainability among households of smallholder farmers.

From the prognostic findings, the study concluded that:

- There were significant changes in livelihood outcomes in terms of household in-house assets ownership, construction of better houses, increased land ownership and use of improved agricultural tool/equipment before and after sunflower production. Also, there were significant differences between participants and non-participants smallholder farmers into sunflower production. Therefore, sunflower production had an influence on the changes in livelihood outcomes among households of smallholder farmers.
- Sunflower production has a significant contribution on the livelihood outcomes among smallholder farmers in terms of household assets and increase in total savings. There were significant changes in livelihood outcomes in terms of ownership of household in-house
- Asset ownership, improved housing condition, increased land ownership and use of improved agricultural tool/equipment before and after sunflower production but also between participants and non-participants. Therefore, sunflower production stands a better chance of improving households' livelihood outcomes unlike other livelihood activities in the district. Nonetheless, the impact is not spontaneous but rather sporadic (basing on livelihood resource endowment) as some households had low livelihood outcomes.
- The study established the status of perceived levels of livelihood outcomes sustainability among smallholder farmers in terms of poor, low, moderate and high basing on the developed index. The findings showed that the majority of smallholder famers' households fall under low livelihood outcomes sustainability status. The study concludes that most of the smallholders' household did not generate enough abilities (such as household income and assets) to enable them withstand future livelihood shock and stresses basing on vulnerability context.
- Sunflower production plays an important role towards influencing livelihood outcomes among the household however, there were a number of socio-economic factors that seems to influence the sustainability of the achieved livelihood outcomes among the households of smallholder farmers. Among the contributing socioeconomic factors, accumulation of household assets, household head age and education level were found to highly influence livelihood outcomes sustainability. However, household head sex and age seemed to have insignificant influence.
- Regarding the Sustainable Livelihood Approach which had assumption that livelihood outcomes among the poor people is built around understanding the five livelihood assets namely physical asset, human asset, financial asset, natural asset and social asset.

The assumption holds true (thus, the study confirms the theory) as findings show that a combination of livelihood assets and households' ability to put the assets into productive uses had an influence on the smallholder farmers' household livelihood outcomes.

Generally, the study recommended that:

Farmers should upgrade the production activities through processing sunflower at local level instead of selling few quantities raw sunflower seeds individually. This can be done through forming farmers groups whereby they can join efforts to access microfinance loans and acquire small scale processing/ milling machines