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RESEARCH ARTICLE

THE SOCIO ECONOMIC FACTORS INFLUENCING PRODUCTIVITY OF THE SMALLHOLDER SUBSECTOR OF THE KENYAN TEA INDUSTRY: A SURVEY OF NANDI DISTRICT

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ABSTRACT

Tea continues to be one of the main foreign exchange earners in the Kenyan economy and the industry employ 75% of the rural population. It is composed of the large scale sub sector owned by the multinationals and the smallholder sub sector mainly owned by the local farmers. Tea production in the smallholder sub sector is still very low compared to the large scale/estate subsector. The low production in the sub sector has been attributed to several socio-economic and technological factors which include, poor labour utilization, low fertilizer application, low adoption of improved technologies, and low plant population among others. A study was carried out to identify the socio-economic factors which influence tea productivity in the smallholder sub sector of Nandi district. 126 farmers from Chebut tea factory were identified and interviewed along key informants who were also identified. Data from the survey and secondary sources was analyzed, and the following were identified as the main socio-economic factors that influence tea productivity, low labour allocated to tea production, low number of tea bushes owned and low proportion of land under tea. It was concluded that the factors that influence yield significantly include number of bushes owned by the farmer, amount of labour utilized and its efficiency. Other factors such as off-farm income, number of clones, proportion of land under tea and tea as a main income were not significant in explaining tea productivity in the catchment. It was recommended that proper system of remuneration should be developed to motivate and employ a higher percentage of the available family labour in tea production. The extension service department should sensitize farmers on the importance of employing the available family labour in tea production.

INTRODUCTION

Kenya is predominantly an agricultural based economy with leading crops being tea, horticulture, cereals (wheat and maize), sugarcane and meat and dairy production are the key economic drivers in the livestock sector (Anon, 1994).Tea is an important cash crop in Kenya. At individual level, it generates cash income and at national level, it generates the much needed foreign exchange and also provides employment. Kenya ranks fourth world's largest producer of black tea, after India, China and Sri Lanka, and the leading exporter of tea (Anon, 2002). Kenya's share of the world tea market increased from 5.6 % in 1970 to above 21% in 2003. Tea is currently the country's leading export crop and foreign exchange earner, accounting for nearly 20% of the total export earnings (Anon, 2003). Tea industry contributes to the livelihoods of over 400,000 smallholder farmers and it provides employment to over two million people (Anon, 2004). The tea growing area around Mount Kenya is usually referred to as East of the Rift Valley, while the western region of Kericho, Kisii, Kakamega and Nandi among others is usually referred to as West of the Rift Valley. In Nandi, the tea industry comprise of tea estates that produce purely for commercial purposes and the smallholder sector that comprise individual farmers who have areas under tea averaging between 0.5 to 2 acres per household, apart from deriving cash income from the enterprise, a high percentage of the farmers do not produce tea purely for economic reasons but also to satisfy their cultural and social requirement (Bahemuka, 1987). It is not a wonder therefore that smallholder owned farms are in various state of management standards partly because of these factors as well as lack of technical know how. It is very common to find a well managed farm next to a neglected one. There are smallholder farmers who look at tea as a status symbol and may grow it just to look like the neighbour without being prepared for its involvement in terms of management required for optimum productivity.

The district potential for growing tea stands at 60,000 ha, but the total area currently under the crop is 14,050 ha, this represents 23.4% of the potential. The smallholder sector has a total of 27 million bushes with an average yield of 0.7kg of

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green leaf per bush per year as opposed to the national average of 1.5kg of green leaf per bush per year in the sub-sector Anon (2003). The research achievement stands at 3.6 kilograms of green leaf per bush per year on average. The Kenya Tea Development Agency (K.T.D.A) objective is to increase production in the smallholder tea sub-sector and attain a national average of 1.8 kg per bush per year and above by 2004. In Nandi this will only be realized if the constraints impeding production are identified and appropriate interventions developed to address them. The probable socio-economic factors that seem to influence performance in the subsector in Nandi are listed below:

i. Inadequate extension services.
ii. Labour availability and cost.
iii. Labour utilization and efficiency
iv. Low proportion of land under tea.
v. Gender disparity in ownership of tea.

MATERIALS AND METHODS

126 farmers were selected from the registration lists of all the tea farmers in Chebut tea factory through a systematic random sampling method. Several parameters were analyzed in on socio-economics and tea management aspects to identify their influence on tea production.

In the study the factors analyzed included:

i. Amount of green leaf plucked
ii. Time spend plucking
iii. Proportion of land under tea
iv. Family labour employed in tea production
v. Hired labour employed in tea production.
vi. The number of days between successive plucking and the number of times a field is plucked per month.
vii. Tea as the major income generating enterprise in the farm.
viii. Fertilizer application regime.

Observations were also made on general farm management and general questions on performance of other farm enterprises which are perceived as direct competitors of tea for factors of production were asked, others areas addressed were buying centre management, how organized was the farmer management structure in running buying centre affairs, proximity of buying centres to the farmers, road status i.e. road condition and how it impacts on tea production operations, answers to these questions assisted in providing information on level of farm management.

RESULTS AND DISCUSSION

The average household size in the tea growing area of Nandi is 8 persons with an average bush population of approximately 6,000, from this the farmer on average has a production of 8,187 kg of green leaf per hectare per year (Table 1), and this translates to a catchment average of 1.2 kilograms Greenleaf per bush per year. The average is far much below the national average of 1.5 kilograms the research potential of 3.6 Greenleaf of Greenleaf per bush per year (Mamati *et al.,* 2002). These findings mean that the gap between the potential and actual production is very wide and farmers should strive to reduce it so as to realize a higher production which translate to better earnings.

Table 1. Socio-economic and technological characteristics of farmers in Chebut tea factory

Attribute	Unit	Value
Number of respondents.	No	90
Average land holding.	Ha	3.88
Average area under tea.	Ha	0.62
Proportion of land under tea.	%	19.7
Average household size.	No	8
Average number of bushes owned.	No	5672.
Number of clones planted.	No	2.33
Productivity in 2005	GL kg ha^{-1}	8187
Tea as main income (proportion of total.	%	77
Fertilizer split application (%).	%	44

The respondents interviewed were the owners of the tea but where the owner (man/husband) was not available the wife was interviewed, it was envisaged that when the tea farm is established the family unit would manage it collectively this indeed was not the case because some questions could not be answered well by the wife or children of the owner they would always refer to him for clarification. It was also evident that key members of the family (husband and wife) were the sole decision makers on the farm even when they have children who have better education than theirs. These children are rarely involved in the tea / farming business. This may contribute to a low level of adoption of improved tea technologies because research done has shown that the level of the farmer's education has a positive correlation with his level of decision making on the farm.

Data Analysis and Interpretation

From the analysis, factors that were significant ($P \leq 0.1$) in explaining productivity in Chebut tea catchments included rate of fertilizer application and the number of bushes owned by the farmers (Table 2). High fertilizer rates result in increased productivity. Farmers with more tea bushes achieved higher yields per unit area. This could be explained by the fact that farmers in general then to put more emphasis in enterprises which utilize more of the resources at hand for example more tea bushes mean that a higher proportion of the land is under the crop and the farmer is obliged to take keen interest on it because his expectations on return on investment for this enterprise is higher. In the event of his attention he will tend to adopt most of the recommended practices resulting in increased produce of better quality which will even motivate him further to produce more.

The study shows that there positive significant correlation between yield and number of bushes owned ($r^2 = 0.43$ $p= 0.05$, $df =49$). This suggests that the higher the plant population the more the likelihood the farmer who is the decision maker will decide to put more emphasis in tea production in terms of time spend in the farm improved fertilizer use and other desirable tea managerial aspects hence increased productivity. The opposite is equally true where the farmer would spend less time in the tea farm because he has fewer plants and result in reduced productivity. With the availability of land farmers should be advised to increase tea hectarages to maximize on the benefits of this relationship. Low tea hectarages results in yields which cannot break-even at most times resulting in low profits which lead to the crop being neglected or given very little time and generally factors of production allocated to the enterprise are less than minimal.

There is a positive correlation between yield and the amount of fertilizer applied (r^2 =0.65, p=0.05, df = 48).This may suggest that proper fertilizer use in tea may improve productivity and excessive use of it impacts negatively on its production. This confirms the research recommendations on importance of fertilizer in tea production. It was observed that there existed a relationship between labour and yield. There is a significant positive correlation between labour and yield (r^2 = 0.15, p = 0.05, df = 90). This suggests that if available labour is utilized well it may result in increased productivity. Farmers in Chebut should try to exploit this option. The aspect of income from tea has a positive partial correlation with production, in this case some farmers have shifted to tea production because of its reliable monthly income and the end year second payment (''bonus'). Extension staff should sensitize farmers to pluck high quality leaf of fine 2 leaves and a bud to realize better earnings, which will act as an incentive to improve on productivity per unit area and in the long run increase the proportion of land under tea.

Table 2. Analysis of socio-economic and technological factors affecting tea yields per bush (productivity) among farmers in Chebut tea factory

Variable	Mean	Coefficient	t-ratio
Fertilizer N kgha^{-1}	164	0.677	5.583**
Number of bushes	5672	0.345	2.627*
Proportion area under tea (%)	19.7	-0.049	-0.385
Number of clones	2.3	0.039	-0.333
Tea main income	0.80	-0.205	-1.533
Split fertilizer application	0.40	-0.046	-0.373
Plucking rounds	2.4	0.205	1.626
Household size	8	-0.056	-0.371

** Significance at (P≤0.05). * Significance at (P≤0.1).

In Nandi the average land holding is four hectares, 19.7% of total land is committed to tea production. This is a very small proportion and confirms the socio-economic position of tea in the community as seen by a higher proportion of land committed to livestock and maize production. The two enterprises are known to be the main source of livelihood in the community, maize being a staple food while livestock ownership both in type and numbers is associated with status and wealth in the society. The farmers who commit a high proportion of their land to tea are young migrant farmers formerly from Kericho district where the crop has been accepted by many as an alternative economic activity and is planted under large hectarages. The farmers in these areas use a higher percentage of family labour in tea production and have a higher fertilizer use efficicieny. They have achieved a higher production per bush of 1.2 kilograms on average which is higher compared to the other areas. This explains why the neighbouring Kericho district(s) currently has nine KTDA managed smallholder owned tea factories while the Nandi has only one yet tea was introduced almost at the same time in the two districts. 95% of the farmers have less than 0.5 Ha of tea and the rest, less than 5% of the farmers have more than 1Ha of tea (10,000 bushes) .Number of bushes owned was significant to the productivity. This means when farmers have a higher proportion of land under tea decision making in terms of utilization of available resources mainly labour and commercial fertilizer seemingly favour tea production hence increased productivity in the enterprise at the farm level. (Figure1). The average production of 1.0 kilograms of Greenleaf per bush per year can be seen clearly to cluster around the average number of bushes owned by the farmers (6,000) an indication which qualifies the findings that plant population has significant positive correlation with productivity. To realize reasonable profits above break-even points and also enjoy benefit from economics of scale farmers should strive to increase their tea hectarages from the current average of 0.6 ha to above1 ha given that most farmers in the catchment own large land (4 ha) much of which is not well utilized. The low hectarages explains the reason why most farmers wanted an increase in the prices of tea to realize profits, though there is economic sense to this**,** the low plant population also contributes immensely to low profits**,** and at times farmers realize losses not because of low prices but high cost of production against low returns.

Conclusion and Recommendations

This study identifies a number of factors that influence productivity of tea in the smallholder sub-sector. The study illustrates that understanding of those factors is necessary for those institutions working with the smallholder farmers as it identifies the production gaps at the farm level and these institutions should develop interventions to best address these gaps so as to improve productivity of the tea business. It was concluded that the number of bushes owned and rate of fertilizer application had a high level of significance to productivity of tea in Chebut catchment, other factors that had positive correlation with production included labour utilization in terms number employed, and time spend in plucking tea. Farmers who have more land should be encouraged to plant more tea. Factors such as off-farm income, split fertilizer application regimes, and competition from other enterprises for factors of production were did not have any significance to productivity though they should not be ignored since they may influence farmers decision making at the farm level.

Extension services should create awareness among the tea farmers on the importance of employing idle family labour in tea husbandry to improve on its productivity and economic benefits on the enterprises. Proper collection schedules of tea at the buying centres should be developed to reduce the time spend by farmers at the buying centre and eventually improve on the time allocated to the plucking so as to give the farmers more time to pluck tea. Vacancies in tea farms which apart from increasing the cost of weeding also have a negative effect on productivity should be avoided. The farmers should be encouraged to develop a sound tea infilling program such that all the missing plants should be replaced before more tea is planted in new fields. It makes no economic sense to increase land under tea with a lot of gaps in the already planted fields.

Recommendations

This study identifies a number of important factors that influence productivity in the smallholder tea sub-sector. The study illustrates that good understanding of these factors is necessary for those institutions working with the smallholder farmers to raise yield levels. The information is also useful in decisions as to which specific factors to invest in.Based on the findings of this study, the following recommendations were made;-

1) To realize increased production time allocated to plucking should be increased. This will require combination of concerted efforts of both the factory management and the farmers in the catchment area.

2) The proportion of family labour utilized in tea production should be increased and where applicable labour utilized in less labour demanding areas such as tending livestock should be utilized in tea production. Proper reward system for family labour should be developed to motivate and enhance the level of its utilization in the smallholder tea subsector.

3) To counter the menace of leaf hawking *(manigirito*), the factory management should strive to increase the monthly Greenleaf payment to the farmers so as to enable them break-even on the monthly operational costs.

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