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COMMITTEE ON COMMODITY PROBLEMS

INTERGOVERNMENTAL GROUP ON TEA

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SUSTAINABILITY OF SMALLHOLDER TEA PRODUCTION IN THE UNITED REPUBLIC OF TANZANIA[1]

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I.   INTRODUCTION

1.   A continuing major concern of the Group has been the achievement of sustainability of tea smallholders. This document examines the key drivers influencing the performance of smallholder tea productivity, using an asset based model to assess stocks and flow of assets of smallholder tea producers in Tanzania relative to non-tea producers. The information provided could be useful in assessing smallholder tea development in other countries. In addition, possible alternatives for the sustainability of smallholder tea production, including a discussion on the costs and benefits of third party voluntary standards, will be examined. There will also be a presentation from the United States, a major importing and consuming country, regarding the social responsibility, good manufacturing practices, concern for the environment and developing marketing point of differences that will contribute to the sustainability of tea producers.

2.   Tea is grown under 22 721ha in Tanzania and the sub-sector is divided between estates (>200 ha, company-owned) and outgrowers (<200 ha, farmer-owned), which include medium-scale farmers with average tea holdings of 16 ha and small-scale farmers with an average 0.37 ha. The tea sub-sector is fully privatized and smallholder yields, which average 1 028 kg made tea/ha, are far less than that of the estate average of 2 354 kg /ha   and considerably less than the 2 075 kg/ha averaged by their counterparts in Kenya. Although smallholders occupy 43 percent of the land under tea, they account for only 30 percent of the 32 059 tonnes produced in 2009. However, income from tea production accounts for 80 percent of the household earnings for the participants in this study. Therefore it is important to understand whether smallholder tea production can contribute to a sustainable livelihood.

3.   For purposes of comparison, Tanzania has 27 142 outgrowers cultivating 11 449 ha, while Kenya has about 400 000 smallholders cultivating 98 185 ha, and account for 60 percent of total tea production in Kenya[1].The institutional set-up is also different. In Kenya, tea produced by smallholders are processed and marketed through their own management agency – the Kenya Tea Development Agency (KTDA) Ltd. KTDA provides high quality planting material, extension services, fertilizer on credit, greenleaf transportation, road maintenance, and enforces strict adherence to plucking standards. KTDA pays farmers monthly and also provides a year-end "bonus" based on market price. In Tanzania, the smallholders are organized into district level associations with a national apex association. Access to planting material is provided by the Tea Research Institute of Tanzania (TRIT) and extension services are provided by either the Tanzania Smallholder Tea Development Agency (TSHTDA), TRIT or by district level smallholder associations. Input credit is not always available; when available it is provided either through factory sponsored input contracts (repaid in greenleaf) or through district level associations. Greenleaf transport is organized by the factories and roads are maintained either by factories, district level smallholder associations or by the Government. Only three factories are partially owned by district level smallholder associations (ranging from 25-50 percent shares), whereby farmers receive share payments (losses) annually. All other outgrower contracts fix greenleaf prices/kg annually through negotiation between the district level smallholder associations and the factories. Only Unilever provides a year-end bonus to outgrowers based on the market price. The two leaves and a bud plucking standard is recommended, but not strictly enforced. In sum, there are a number of institutional and agro-ecological differences that contribute to the lower levels of smallholder productivity in Tanzania.

4.   This document examines the performance of smallholder tea productivity in Tanzania using an asset-based model to assess stocks and flow of assets. The results of this study can be generalized only to the areas examined, but may prove useful for assessing smallholder tea

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[1] FAO 2007 questionnaires.

development in other countries. In addition, possible alternatives for the sustainability of smallholder tea production, including a discussion on the costs and benefits of third-party voluntary standards, is examined.

II.   METHODOLOGY

5.   A multi-stage cluster sampling technique was used to obtain representative cases of the Tanzanian tea sector. Four villages in Mufindi and eight 'tea sub-schemes' in Rungwe were used as sampling frames from which specific sampling strategy was employed. The sample of 404 households included 272 smallholder tea growing households in the two growing districts (71 in Mufindi, 201 in Rungwe), 25 medium-scale tea growing households in Mufindi and a sample of non-tea smallholder households in each district (27 in Mufindi, 80 in Rungwe) to control for the effect of tea on farmers' livelihoods.

6.   Given the importance of greenleaf yield as an indicator of sustainability for tea-based livelihoods, a linear multiple regression model was used to correlate a range of independent variables, such as farmers' age, soil type, etc. to the estimated greenleaf yield (dependent variable) (N=301) (see Tables 4-6). A correlation matrix (Table 1) was used to shortlist variables that showed significant correlation ($p<0.001$) with estimated greenleaf yield. These were screened to eliminate predictor variables that were strongly correlated with each other. Screening was repeated for all variables until a list of independent variables with minimal correlation amongst them was obtained for running the stepwise, linear multiple regression model (Tables 4-6).

7.   In 2009/2010, thirteen in-depth interviews with stakeholders who were certified against sustainability standards were conducted. Twelve focus groups were formed comprising certified smallholders and hired labourers. A purposive sampling technique was used to select research participants as the population of certified stakeholders is small and availability of smallholders and hired labour was limited to their ability to participate in the focus groups[1]. Qualitative analysis was then conducted to examine the performance of these schemes based on the perceived costs and benefits reported by participants.

III.   RESULTS OF THE ANALYSIS

A.   THE ASSET-BASED MODEL OF SUSTAINABLE AGRICULTURE (ABMS)

8.   The ABMS model involves four key components as illustrated in Figure 1. The model assumes that the availability of and access to the five assets (natural, social, human, physical and financial) is shaped by contextual factors such as agro-ecological, climatic, cultural, economic, legal, political and social which in turn are mediated by external institutions and policies. As tea is grown only for its commercial value, the main product of smallholder tea livelihood systems is the greenleaf delivered to the collection centre. The value of greenleaf is determined by the quality, price and volume produced per unit cost. During the process of sustaining livelihoods through tea production, there are two possible outcomes: positive and negative feedback loops.

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[1] Patton, M. Q. (1990). *Qualitative research and evaluation methods* (3rd ed.). Newbury Park, CA: Sage.

Figure 1: Asset based model of agricultural systems-flows and outcomes in the tea based livelihood systems how the external contextual factors [1] together with the stocks of assets [2] influence the livelihood system [3] resulting in the outcome [4].[1]
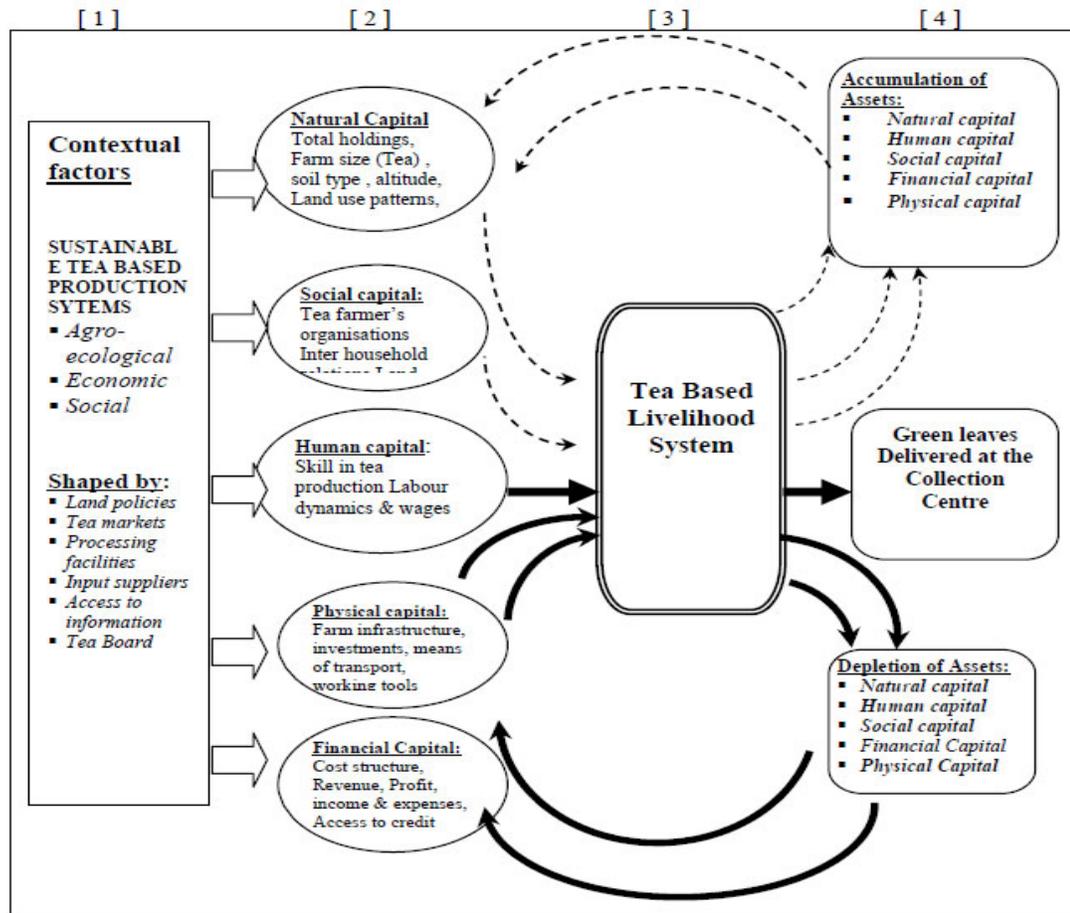
Natural Capital

9.   Land holding, fertilizer application rates and greenleaf yields were used to assess natural capital flows. It appears that, the limitation in stocks of household resources (like land) tends to limit that particular household engaging in diverse farming activities including tea production. On average, smallholders in Mufindi had significantly higher proportion of tea area over total holdings (M=46 percent, SE = 2.03), than their counterparts in Rungwe (M=31 percent, SE = 1.49). In both cases smallholders had smaller proportions of tea area over farm total holdings as compared to the medium-scale growers (M=56 percent, SE = 2.87) ($p<0.05$).

10.   The same trend is observed for the fertilizer application rate, whereby medium-scale growers use higher rates of fertilizer (125kg N/ ha) compared to the two smallholder cases in Mufindi (65kgsN/ha) and Rungwe (53kgs N/ha). For smallholders, the main source of variation in input use is associated with resource constraints.Although farmers in all three case study areas have access to input credit facilities, smallholders are particularly reluctant to take the recommended input quantities due to lack of confidence in their ability to repay the loans.

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[1] Simbua, E. F. (2006). *The Economic Sustainability of Smallholder Tea Production Systems in Tanzania.* Cranfield University, Silsoe.

11.   Comparison in yield levels show that medium-scale growers had the highest greenleaf yield (10 599 kg GL/ha), smallholders in Mufindi had moderate yield (8 070 kg GL ha-1), and those in Rungwe had the lowest (4 476 kg GL/ha). The quality of land, modified by environmental factors such as temperature, rainfall pattern, soil type and terrain, contributes to potential yield. The results show the linkages between the stocks of natural assets (land) combined with management practices and input levels and natural quality of land result in higher yield, which is linked to higher revenue from tea.

Social Capital

12.   For tea based livelihood systems, social capital consists of institutions like grower associations, rules for hiring labourers and access to community assets. The tea sub-sector is one of only a few in Tanzania with well organized farmer organizations. However, a substantial proportion of smallholders in Rungwe (21 percent) and in Mufindi (18 percent) were unsure of their membership status, which may limit the influence of associations.

Human Capital

13.   Age of the household head, number of household members, household members working on the farm, total farm labour (person-days/ha), the farmer's experience in tea (number of years) and the percentage of farmers who received formal training are the indicators used to assess the stocks of human capital /assets and flows of services across the three case study areas.[1] Formal training is provided by TRIT and local factories within their catchments. Training includes crop husbandry, plucking standards, logistics coordination, and advice on the use of recommended fertilizer rates in order to improve productivity. The proportion of smallholders who received formal training in Mufindi (56 percent), and Rungwe (51 percent) was significantly different than the medium-scale growers (83 percent). Comparison of mean fertilizer use rates and yield levels for the trained respondents and those not trained (Table 2) supported the assumption that farmer training can improve performance of the production systems.

14.   The results show an inverse relationship between years of experience growing tea and estimated yields (Table 1). Experience in tea production (-0.312, $p < 0.001$) and age of the household head (-0.159, $p < 0.001$) were negatively correlated with yield contrary to popular assumption that experience improves efficiency and hence productivity. These two variables were also correlated with each other (0.682, $p < 0.001$). This result confirms the results gathered through interviews that the labour demands of tea production can be limiting to the productivity of aged farmers. Aged farmers also struggle to adapt to the changing recommendations for tea management practices that have been introduced in recent years. In extreme cases, age restricts some older farmers from participating in tea production, relying instead on hired labourers. There is evidence of poor tea bush maintenance and management on farms that rely on hired labourers, particularly if the supervision of labourers is poor.

Physical Capital

15.   Physical or man-made capital consists of tangible assets acquired through household member activities. Farmers self-identified the most common assets accumulated through tea revenue, including: houses, farm machinery, means of transport (vehicles, motorcycles, and bicycles), and means for communication (radio, television). All the interviewed medium-scale

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[1] Prior research had identified family labour (determined by the number of people available for farm work) as one of the determinant factors on the performance of various farming systems (c.f., Dawson, P. (1987), Labour on the family farm: a theory under uncertainty, Agricultural Economics, 1: 365-380; Bar-Shira, Z. and Finkelshtain, I. (1992), Labour on the family farm: a theory under uncertainty – an extension, Agricultural Economics, 8, 33-43). However, this assertion is not supported by our results as we note no significant difference in the average number of people available for tea production between the two smallholders case study areas {t (276)=0.27, $p < 0.05$}. However, the result was significant between the typical smallholders in Mufindi and the medium-scale growers {t (98) =-2.63, $p < 0.05$}. Even within each case study areas, the variations are less significant as shown by the low standard error of means for Mufindi (0.014) and Rungwe (0.08) smallholders and the medium-scale growers (0.24).

growers reported to have used income from tea to buy household assets, whereas only half of the smallholders (Mufindi = 53 percent; Rungwe = 50 percent) used income from tea to buy assets. On the basis of all four indictors, tea growing households have consistently outperformed non-tea households in terms of possession of higher valued household assets.

Financial Capital

16.   Financial capital includes savings accrued from income generated through greenleaf sales, purchase of inputs, access to credit, and other sources of financial resources for tea production. However, the data collected included only flow variables as exclusive stocks of financial assets attributed to tea were difficult to establish. With this limitation, the income and expenditure patterns of the interviewed households were explored to determine the contribution of tea towards household income profiles (Table 3). In sum, the observed income patterns were mainly determined by yield levels. Yield levels also depend on the level of inputs and management practices on-farm, thus fungible financial capital can contribute to productivity through paying for inputs (agrochemicals) and services (e.g., labour, transport and mechanisation). Access to credit for fertilizers releases funds for other activities for which credit is not available. Therefore, growing tea may facilitate borrowing (and payback) and hence sustain more livelihood options compared with non-tea households.

17.   At household level the ABMS captures the dynamic issues facing tea growers whereas standards enter at numerous stages along the tea value chain and influence market efficiency and access. Together these aspects contribute to the sustainability of smallholder tea production. Therefore, as a basic level of sustainability in tea producing households, it is important to explore further the costs and benefits of third-party certification schemes that claim to be making tea value chains more sustainable.

B.   COST AND BENEFITS OF SUSTAINABILITY STANDARDS

18.   Globally, third-party certification has emerged in efforts to reform existing production practices and value chain organization. For example, the development of private standards and labels and their emphasis on 'quality' has brought about significant changes in methods of sourcing.[1] Science-based, voluntary, social, and ecological standards are regarded as a way to make tea production more sustainable. Through these certifications, third-party standards development organizations promote sustainable development and agri-businesses seek competitive advantages such as branding, risk reduction, and increases in supply chain productivity, quality, and innovation.[2] Within the Tanzanian tea sector, four standards are currently being used: Ethical Tea Partnership, Fairtrade, Organic and Rainforest Alliance. Currently in Tanzania, only the Fairtrade scheme includes smallholder farmers while the other schemes are confined purely to estate production. Table 7 summarizes the responses received from focus groups and interviews.

19.   Fairtrade's notion of sustainability focuses on the ABMS model of sustainable livelihoods and promotes direct purchase of tea from the factory. The Fairtrade scheme guarantees a floor price of USD 1.40 / kg and a premium of USD 0.50 / kg which is deposited into a fund used exclusively for community development.[3] Producers pay an average of USD 4 000 yearly for the Fairtrade certification. Smallholders have reported significant benefits to the community from participation in the Fairtrade scheme. In Rungwe, RSTGA has reported receiving over USD 1.2

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[1] Hatanaka, M., Bain, C., & Busch, L. (2005). Third-party certification in the global agrifood system. *Food Policy, 30*(3), 354-369.

[2] GTZ. (2006). *International Conference Proceedings*. Paper presented at the Shaping globalisation – Impacts of voluntary standards, 24 - 25 October 2006, Berlin, Germany.

[3] For hired labour USD 0.10 /kg is to be kept by the factory out of the USD 0.50 / kg premium. Some Fairtrade buyers (e.g., Cafedirect) will pay the USD 0.10 / kg to the factory in addtion to the USD 0.50 /kg premium for the smallholder producers.

million over 7 years from Fairtrade premiums. They have also reported a five-fold increase in greenleaf yields - from 3 tonnes in 2001 to 16 tonnes in 2009. However, this cannot solely be contributed to Fairtrade as additional incentive structures have been in place such as new factory management, a new extension and greenleaf transportation service, and the purchase of a 25 percent share in the processing factory by the smallholder association. Moreover, RSTGA employs a full-time accountant who handles the reporting, policy and budget requirements associated with Fairtrade for its 13,000 members.

20.   Additionally, there are cases of both a smallholder association and an estate that have lost Fairtrade certification. The smallholder association received Tsh 10 million (USD 7 500) in its premium fund during the first year but could not raise enough funds to continue to pay the certification fee. It also defaulted on the reporting requirements. The estate could not make the investments required for compliance and also witnessed the market demand disappear due to the low quality tea the estate produced. These results challenge the ability of Fairtrade to improve the sustainability of the smallholder production system.

IV.   CONCLUSIONS

21.   The results of the analysis show that farmers involved in tea production own relatively bigger stocks of household assets compared to non-tea households (Table 3). Amongst the smallholder tea farmers, there is also evidence that households with larger stocks and better flows of assets tend to perform better, in terms of greenleaf yields, than those with smaller asset bases (Table 1). The response from non-tea farmers show that access to land and farm labour is the key factor affecting the ability of a household to engage in tea production. This result further confirms the proposition that the level of household assets indicates the ability of that household to engage in productive activities. As tea production is associated with accumulation of assets, then it can be concluded that involvement in tea production widens the capability of the household to sustain their current livelihoods.

22.   The results also confirmed that performance of the respective production systems (measured by the greenleaf production per unit area) is positively correlated with the level of inputs used (particularly fertilizer). Other influential factors include labour, farm size, and the proximity to the well-maintained tea estates (Tables 4-6). For the typical smallholders, both the inherent farmers' knowledge (enhanced through training and access to information) as well as stocks of household assets (owned or accessible to farmers) appear to contribute to the better performance of the respective production system (Table 5). For medium scale growers only fertilizer (kg N/ha) and tea farm size (ha) were found to be significant predictor variables explaining over 94 percent of the observed variability in greenleaf yield (Table 6). It has been observed that medium scale growers tend to follow recommended practices, especially on input use compared to the typical smallholders who are often constrained and are compelled to adopt suboptimal management practices. Increased tea field sizes and increased involvement of younger farmers could help to improve the sustainability of the smallholder production system. An important determinant of smallholder sustainability is the greenleaf price. Since the data were first collected, it is seen that the average greenleaf prices for smallholder tea increased to an average of Tsh 135 (USD 0.10)/kg in Rungwe and Tsh 145 (USD 0.11)/kg in Mufindi, which reflect industry wide increases in auction prices and the increase in the regulated minimum price in Tanzania (currently Tsh 110/kg). However, since the survey was administered, fertilizer prices have more than doubled while greenleaf prices have not matched the increased costs of production. Therefore, the challenge of escalating input prices and sluggish greenleaf prices of the current system pose challenges to the performance of these production systems. As shown in the results, fertilizer use alone accounts for 32 percent variability in yields. The implication of high fertilizer prices translates into a diminished ability of smallholders to purchase and apply fertilizer, which will lead to lower yields, and as a result less income. This will pose a significant constraint to long-term sustainability of the system.

23.   Considering that smallholder involvement in third-party certification schemes is limited, there is no evidence that the inclusion in these schemes has significantly influenced either yield or greenleaf price for smallholders. However, with the Fairtrade scheme, we have seen increases in social and physical capital for smallholder communities. According to the results from the ABMS analysis, this should contribute to the sustainable performance of these production systems, but alone it is insufficient. Moreover, the costs of certification and compliance that are incurred by smallholders are prohibitive and must be handled by a well organized smallholder association. The success of Rungwe compared to the other two certified growers is determined by the institutional support and cooperation available in this district. Moreover, as noted in document CCP:TE 08/5,[1] in the case of social and environmental standards it is also important that the tea produced with these specifications meets consumer expectations with regard to quality, consistency and price. It is precisely on this point where the social and environmental standards fall short, and without a strong national or industry wide effort to enforce quality control, the investments made to join these certification schemes will bring little to no benefit to smallholder farmers.

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[1] In relation to discussions on Geographic Indicators.