

# Tea production in Kenya

## Impact assessment of two training models



### Sustainable tea production in Kenya: Impact assessment of Rainforest Alliance and Farmer Field School training

Executive summary, 26 June 2012

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#### Introduction

In Kenya, two streams of activities have been undertaken to support farmers connected to the Kenya Tea Development Agency (KTDA) to enhance sustainability of their tea production practices and to contribute to sustainable tea value chains, namely Farmer Field Schools training (FFS) and Rainforest Alliance (RA) training and certification. LEI Wageningen UR, together with other project partners developed a monitoring and evaluation (M&E) plan to monitor the training modalities, and to generate data to track the impact of both of these training models on knowledge levels, implementation of GAPs, production, income and livelihood.

This impact assessment used the *difference in difference* approach, which relies upon the analysis of two sources of variations. First, we compare the new situation (February 2012) with the baseline situation (July 2010) to characterise the evolution. Second, we analyse the differences between the comparison groups and the treatment groups to account for contextual factors other than the training that might influence the process as described in the logic model. The comparison groups provide information for assessing the counterfactual situation for the treatment groups, namely: 'What would have happened to the households without the treatment?' Three treatment groups were distinguished in this study: the group that had received both RA and FFS training, the group that had received only RA training and the group that had received only FFS training.

This brief presents the executive summary of the impact study report 'Sustainable tea production in Kenya. Impact

assessment of Rainforest Alliance and Farmer Field School training'. This report can be found at the LEI website: [www.lei.wur.nl](http://www.lei.wur.nl).

#### Impact of training activities on farmers' knowledge of GAPs

With regard to the impact of farmers' knowledge of GAPs, we present conclusions on the experimentation behaviour, on the overall knowledge scores of the training groups and on knowledge sharing among farmers.

#### Experimentation

RA and FFS training activities contributed to farmers experimenting more with non-tea agricultural activities. Compared with the situation in 2010, both the number of farmers and the variety of experiments increased significantly in the post-training situation for all farmers. Significant differences were observed among the groups: while the percentage of farmers who experimented more than doubled in all treatment groups, it decreased by 50% in the comparison group (no FFS or RA training).

#### Knowledge on GAPs

Both the FFS and the RA training had a positive impact on the farmers' knowledge levels. The overall knowledge of GAPs increased significantly between 2010 and 2012. All trained groups had a higher level of knowledge than the non-trained group, with the RA + FFS training group having the highest level of knowledge increase. Results of the regressions analysis showed significantly positive effect of FFS training and RA training on the increase in knowledge and the synergetic effect of the two training

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programmes on the increase on knowledge scores. The analysis also showed the offsetting effect of initial knowledge level on the impact of training, i.e. farmers who had lower knowledge scores before the training showed significantly more improvement in knowledge scores than those who had higher knowledge scores before the training. This could be explained by the diminishing space for improvement at higher knowledge level.

The survey results therefore confirmed the logic model, in which an increase in knowledge as a result of the training was assumed. Focus group discussions confirmed that farmers learnt a lot in their RA and FFS training.

#### Knowledge sharing

Both RA and FFS training had a positive impact on the sharing of knowledge between farmers. This applies especially to the FFS training. In 2012, significantly more farmers have shared knowledge with neighbours, while the percentage of farmers who never share knowledge dropped almost by 50%. FFS farmers, for whom knowledge sharing is a central feature of the extension model, increased knowledge sharing significantly, while the other training groups also increased knowledge sharing albeit not significantly. Farmers in the comparison group (no FFS or RA training) have decreased their level of knowledge sharing since 2010. The sharing of knowledge was confirmed during focus group discussions, and the farmers specifically mentioned that they disseminated information on practices that they themselves had adopted

### Impact of training activities on farmers' implementation of GAPs

#### Overall developments

Most farmers improved their implementation of GAPs between 2010 and 2012, although much improvement is still possible (one quarter of the indicators have a score of less than 6 out of 10 in 2012). Large and significant positive differences between 2010 and 2012 can be found for most of the individual indicators in all three categories (production, environmental and social indicators). The increase in the value of the indicators was significantly higher among farmers with relatively low values in the pre-training situation.

#### Production indicators (profit)

Training activities, especially the FFS training activities, improved the production practices of the trained farmers. There was a significant increase in the overall score for the production indicators between 2010 and 2012 in all groups of farmers. However, there was no significant difference among the four training groups in the overall production indicator in 2012. The increase in the overall

score for the production indicators was the highest in the group with only FFS training, followed by the group with RA + FFS training.

#### Environmental indicators (planet)

Training activities, especially the RA training activities, had a significantly positive impact on the increase in the application of environmental GAPs. The average score for the group of environmental indicators showed a similar trend as the production indicators. All four groups show a significant increase in the application of environmental GAPs; the increase for FFS farmers was the lowest and the increase in the group with RA + FFS training was clearly the highest. The group with RA + FFS training and the group with only RA training also scored significantly higher than the comparison group on the overall environmental indicator in 2012.

#### Social indicators (people)

Training activities, especially the FFS training activities, had a significantly positive impact on the implementation of social practices. While the score for the comparison group showed no significant change between 2010 and 2012, the scores in all three trained groups increased significantly. In particular, the group with RA + FFS training and the group with only FFS training scored significantly higher than the comparison group in the post-training situation.

### Impact of training activities on farmers' use of inputs

#### Fertiliser application

Training groups have increased the application of fertilisers. On average, the cost of chemical fertiliser per kilogram of tea increased significantly between 2010 and 2012 for all farmers due to the increased application and price of the fertilizer; this is particularly the case in the group with FFS training, followed by the group with RA + FFS training. Organic fertiliser was applied by about 27% of all farmers in the post-training situation.

#### Crop protection products

The percentage of farmers using crop protection products on tea has decreased significantly from 2010. Only 12% of all farmers said they applied crop protection products in 2012, and the products indicated that they mainly use herbicides (8%).

#### Labour

Training seems to have resulted in an increase in the hiring of labour for pruning and fertiliser application. The training groups used significantly more hired labour in weeding and applying fertiliser than the group without training in the 2012 situation. Total costs for hired labour per kilogram of green leaf have increased over time but

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did not differ significantly among the four training groups. Farmers in the group with only RA training had on average the highest hired labour cost per kg of tea, while the group with RA + FFS training had on average the lowest hired labour cost.

## Impact of training activities on farmers' production and income

### Production and productivity

For all the farmers, there has been a significant increase in tea acreage since 2010. However, the number of bushes and the total yield in kilograms do not differ significantly from the baseline situation. On average, productivity (yield in kilograms per bush) has increased the most for farmers who are both members of an FFS and are trained for RA certification. However, the difference is not statistically significant due to high variation within each group.

Training has impacted positively on the quality of the leaf supplied to the leaf collection centres, leading to fewer rejections. The percentage of farmers whose green leaves were never rejected increased significantly in the groups RA farmers and FFS farmers, and the percentage of farmers whose tea was rejected more than three times declined significantly in all groups.

### Net income from tea production

Training may have contributed in a wider constellation of factors to the increase in net income from tea production. Note that this conclusion must be taken with caution and will be further explored in subsequent measurements. All training groups increased significantly their net income from tea production between 2010 and 2012. The highest increases were found for the FFS group and the FFS + RA group.

Remarkably, the increase of net income was larger for the comparison group than for the group with only RA training, although the group with only RA training has higher productivity increase. One possible explanation is that the RA trained group has higher labour costs (e.g. for weeding). Another explanation could be that RA training has more focus on 'environmental' issues, such that farmers may have undertaken actions that decreased the number of bushes on their land.

This is also corroborated by statements made by the training groups on whether they earn more or less from tea production than in 2010. Around 80% of the farmers in the training groups FFS + RA, the training group FFS and the comparison group said they had earned more, while only 61% of the farmers in the RA training group indicated the same.

### Other sources of income

We cannot conclude whether participation in training has affected the number of other sources of income because we do not have such data for 2010. However, especially the training groups indicated that that they now earn more from other sources than they did two years ago, while especially the non-trained indicated that they now earn less. This would indicate that trained farmers have increased their income from sources other than tea production, and that the knowledge of GAPs could have spin-off effects on the other agricultural activities of the farmers.

## Impact of training activities on farmers' livelihoods

Overall, significant improvements were observed for all livelihood indicators except 'Your relations with your neighbours' (which was already very high) and 'Access to self-help activities'. The perceived improvement of livelihood was the highest in the group receiving RA + FFS training, followed by the group with only FFS training and the group with only RA training. All trained groups had more indicators showing livelihood improvement than the comparison group.

## Farmers' evaluation of FFS training

Overall, farmers who had FFS training were very happy with their training, although they were less content with the development of commercial activities by the FFSs. Almost all farmers indicated they that benefitted from the FFS training. Benefits ranged from a higher income to higher productivity, leading to fewer fights over money in the household as well as the implementation of activities other than tea, leading to more self-sufficiency in food, and empowerment for women. Farmers also said that their relations with the factory had improved. Challenges mentioned are the age of the members (youngsters seem to know it all and thus do not become members), illiteracy and a slow rate of rolling out the FFS to others. Graduated farmers could assist in this by teaching other farmers. FFS groups we spoke to indicated that the sustainability of their groups is facilitated by their registration as a self-help group. We can thus conclude that the FFS developments are evaluated very positively by the farmers, and that there is scope for the future. We cannot yet conclude, however, that the FFS system can and will be maintained in the future, as it has been implemented only relatively shortly.

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## Farmers' evaluation of RA training

Almost all the farmers who had participated in RA training activities evaluated the activities as very positive and indicated that they had benefited from them. Benefits mentioned are mainly environmental and social, although the improvement of productivity and green leaf quality was also mentioned. They also said that their relations with the factory had improved. It seems from discussions with KTDA factory staff from the two RA factories in this study, that RA certification is already embedded in their factory system (audit costs, lead farmer costs, a programme for continuous improvement).

Issues mentioned by the farmers for the future are to continue the training activities, also on other topics than addressed now, to have the right people at the training activities (both spouses), and to motivate farmers to participate by communication, certificates and offering tokens/refreshments. Challenges mentioned by factory staff include upfront investment costs (PPE) and having no rewards to give to farmers for participating. Credit facilities and a premium price for RA tea would also be helpful. Lastly, some farmers ran away from lead farmers during inspections because they were afraid they would be reprimanded.

## Recommendations

The following recommendations are clustered around two themes: the methodological and data quality issues, and taking a broader perspective on training outcomes than only using household level analyses.

### Methodology and data quality

We have established several methodological and data quality recommendations that can be used for future impact assessment using household level analyses.

### Recording data on training activities of surveyed households

The KTDA system is an almost ideal system on which to do such an impact assessment study, because all the farmers and their production data are known by the factories, and information was available on the training given in the factory catchments. Even so, we had some difficulties in grouping the farmers according to the training they had received. For instance, some farmers from Ndima indicated that they had participated in RA training activities, while no official RA training had taken place in the Ndima factory catchment. Thus, these farmers initially belonged to the group of farmers who were trained for RA, or were trained for RA as well as being a member of an FFS. We changed this after receiving feedback from the project team, and this impacted heavily on the results and the conclusions. We should have checked these descriptive statistics much

earlier with KTDA or project staff to see whether the information given by the farmers was correct.

**Recommendation 1:** Farmers or staff working with the farmers should record relevant information about which training the farmers have attended as much as possible.

### Taking into account the quality of the training activities

With regard to the quality and quantity of various training activities, we compared two types: the FFS as a very intensive extension method, and training for RA certification as a less intensive method. We had much information about the quality of these trainings, enabling us to compare the training groups with each other, even though the farmers in the groups were trained in different FFS / factory catchments. To be able to do better assessments in other assessments, especially to be better able to attribute the outcomes to the training activities, it would be best to have detailed data recorded of the activities evaluated. Such information could be used to establish an indicator of the quality of the training activities evaluated, which could be used in analyses. The following information would be minimally needed to construct such an indicator: i) frequency of the training activities, ii) time per training activity and actual time spent on the training per training activity, iii) content of the training activities, iv) knowledge, experience and skills of the facilitator (including expertise in adult education), and v) the knowledge, experience and skills of resource persons.

**Recommendation 2:** Take into account the characteristics of the training activities analysed, by gathering detailed information about the quality of the training activities and using this 'training quality' indicator for analyses to better attribute the outcomes of the analyses to the quality of the training interventions.

### Collecting good quality data

When you ask farmers about what they have done in the past year, the inputs they have used and how much they have produced, it is very likely that you do not get the most reliable results. People all over the world, including farmers, have problems recollecting exactly what has happened in the past (recollection bias). Results based on survey data should therefore be interpreted with caution. In addition, it can be the case that farmers simply do not know the information we assumed them to have, or that detailed information is available but not used for the study.

We have had the experience in this study that farmers indeed gave information that appeared to be incorrect. Examples are farmers who said they had received a particular training, but had not received it. Other examples are that farmers did not know how much the

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chemical fertiliser they applied costs (because the KTDA supplies the fertiliser and deducts fertiliser costs from the payment for green leaf supplied) and that the KTDA records the green leaf supplied to them at factory level.

It would be best for the analyses to have the information that is important for the study recorded when it becomes clear. For example, when a farmer plucks in a certain week, it would be best to record for that week how much he plucked, how much time he or hired labour spent on plucking, how much he paid the worker, and what he received for the green leaf supplied to the factory. To do such recordings may cost farmers time, but possibly far fewer farmers would need to be in the sample were such detailed and high quality data available. Moreover, the power of such studies would be greatly enhanced when data from multiple sources are gathered, cross-checked with each other and combined where necessary before conducting analyses.

**Recommendation 3:** Record detailed data on the activities, inputs and production of each household in the survey on a regular basis, for example weekly or bi-weekly to avoid recollection bias. This could be done by the farmers (although illiteracy may be a problem here) or by factory or project staff.

**Recommendation 4:** Combine household data with data from other sources (such as factory data) to cross-check the household data, and add information to the analyses, such as factory data, rainfall data and market information (price fluctuations), because they could have an impact on the results.

### [A broader perspective on training outcomes](#)

In addition to issues related to conducting impact assessments based on household surveys, we also analysed ways forward in assessing the impact of interventions by analysing information from other actors in the tea value chain.

### [Analyse changes over time in the quality and quantity of tea delivered by the farmers and produced by the factory at the factory level](#)

For tea, quality is a big determinant in the price received per unit. Therefore it would be best to have the development of the tea quality over time tracked in order to see whether the interventions in the factory catchment have had an impact on overall tea quality. This could be done by documenting the volumes produced and sold of the various quality classes, and the price they receive on the market over a longer period of time. We think that such information is already available at KTDA. In doing the analyses, exchange rate influences and overall market price fluctuation should be taken into account in order to be able to draw conclusions.

**Recommendation 5:** Use factory and market data on qualities and quantities of tea sold over a longer period of time and market price fluctuations to establish impact of the intervention on the factory level.

### [Conduct a cost-benefit analysis and cost-effectiveness analysis of the intervention](#)

Surprisingly, many extension and certification initiatives have very little insight into the costs and benefits of their interventions. We think that it is important to do an upfront analysis of the estimated costs and benefits of such intervention programmes, to be communicated to the farmers who will most probably (finally) benefit from or bear the cost of such programmes. If stakeholders know exactly what is in store for them from the beginning and make an informed decision whether and, if so, how to implement an intervention, this could also ensure the future sustainability of the programmes. The results in this study are very interesting as they entail the benefits of the RA and FFS training programmes. Although both programmes have quite some positive impacts, their costs are not clear yet. It would be highly relevant to know how much the implementation of these training activities has cost as this would allow calculation of their cost-effectiveness. Here, discussions would need to take place to decide which costs and benefits to include in the study, as there are quite some differences in opinion in this regard (e.g. include farmers' time spent on training and their opportunity costs in the calculations, even though there may not be any other opportunities).

**Recommendation 6:** Conduct a cost-benefit analysis with estimated costs and benefits at implementation level prior to implementing an intervention, and discuss this with all stakeholders involved for informed decision-making. Such decision could be, for example, whether the intervention should be a one-off investment or continuous investment (e.g. life-long learning). The cost-benefit analysis could also be done for individual intervention elements in a larger programme (e.g. separate for a certification programme within an overall agricultural development programme) so that involved stakeholders can decide whether they want to start such an intervention.

### [Assess the costs, benefits and impact of interventions for all actors in the value chain](#)

Not only farmers may benefit from interventions such as the FFS and RA certification analysed in this study. Factories may see the quality and quantity of tea produced increase, and tea packers and retailers may be able to earn a better income (improved profit-margins) from the 'intervention' tea sold than from non-intervention tea (e.g. by using labels, or because of overall quality increase for which they can ask a better price).

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There are probably also costs involved for more actors in the chain than just the farmers and the factories they supply (e.g. a fee paid by tea packers to standard setting bodies for using their label). These costs may even outweigh monetary benefits, such that profit margins for 'intervention' tea can be even lower than for 'non-intervention' tea. Therefore, it would be good to map out the cost, profit margins and benefits for all actors in the tea value chain in order to obtain a complete view of the impacts of the intervention.

**Recommendation 7:** Conduct a cost-benefit and impact analysis of intervention for all actors in the value chain, including the calculation of profit margins.

### Further reading

Doorneweert, B., Y. Waarts (2012). Brewing business models for smallholder tea certification, a quick-scan of models in Sri Lanka, Indonesia and Kenya. LEI Wageningen UR, 12-039

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