

Support to Coffee Farmers in Northern Haiti Project Effectiveness Review

Livelihoods Support



**Oxfam GB
Livelihoods Support Global Outcome Indicator**

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Table of Contents

Executive Summary	4
1 Introduction and Purpose.....	5
2 The Project: Support to Diversification for Coffee Farmers in Northern Haiti	6
3 Intervention logic of the support provided	7
4 Impact Assessment Design.....	8
4.1 Limitations in Pursuing the Gold Standard	8
4.2 Alternative Evaluation Design Pursued	9
4.2 Reconstruction of baseline.....	10
4.3 The Comparison Group	10
5 Outcome indicators	12
5.1 Livelihoods outcome indicator	12
5.2 Other outcome measures.....	13
Subjective income change	13
Ability to meet basic needs	13
Household food security.....	13
Household ownership of assets	14
Agricultural production and sales	15
Other productive activities	15
Attitudes to women's roles	15
5.3 Measuring intervention exposure	16
6 Methods of Data Collection and Analysis	16
6.1 Data Collection	16
6.2 Data Analysis.....	17
6.3 Main Problems and Constraints Encountered	18
7 Results.....	19
7.1 General Characteristics	19
7.2 Intervention exposure	21
7.3 Evidence of impact on outcome measures.....	23
7.3.1 Coffee production	23
7.3.2 Diversification of household income.....	26
7.3.3 Household income and consumption	31
7.3.4 Food security	35
7.3.5 Asset wealth	35

7.3.5	Education spending	36
7.3.6	Gender balance in household expenditure.....	37
7.3.7	Attitudes to gender roles	38
8	Conclusion and Programme Learning Considerations.....	40
8.1	Conclusions.....	40
8.2	Programme Learning Considerations	41

Executive Summary

Under Oxfam Great Britain's (OGB) Global Performance Framework (GPF), mature projects are being randomly selected each year for a rigorous assessment of their effectiveness. In the 2011/12 financial year the project in support of diversification for coffee farmers in northern Haiti (HAIC15) was selected for evaluation against OGB's global indicator for livelihoods:

- **Percentage of households demonstrating greater income, as measured by daily household expenditure per capita.**

This project is implemented by RECOCARNO, a network of eight coffee producers' cooperatives. This network was established with OGB support in 2001, and it has continued to be an OGB partner since then. RECOCARNO has Fairtrade certification, which enables it to purchase coffee produced by its members and then sell it to buyers abroad at above-market prices. It also provides its members with training and technical support in production techniques for coffee and other crops, as well as in non-agricultural income-generating activities.

In November 2011, an external consultant and a team of enumerators carried out a household survey with 493 randomly-selected coffee producers in the North and North East departments of Haiti. Survey respondents were selected from among the membership of four RECOCARNO cooperatives and the membership of three cooperatives outside the RECOCARNO network, which were considered to be suitable as a comparison group. The survey was designed to capture data relevant to OGB's global indicator for livelihoods, as well as other intended outcomes, including those related to income diversification and attitudes towards women's economic roles. At the analysis stage, the statistical tools of propensity score matching and multivariable regression were used to control for observable differences between the intervention and comparison respondents.

Overall, the results provide evidence of a slight positive effect from RECOCARNO membership on household income. However, this overall effect masks a large difference between the two regions. Specifically, there is evidence of a substantial positive effect for members of the RECOCARNO cooperatives in the North East but none at all for those in Dondon. The higher level of consumption in the North East appears to be driven by the higher prices that these producers are being paid for their coffee. However, there is no evidence that these particular members are diversifying their sources of income. In fact, they are actually more focussed on coffee and sell fewer other crops than members of the comparison cooperatives. In Dondon, while there is no clear advantage to RECOCARNO membership in terms of the price received for coffee, members of the RECOCARNO cooperatives are bringing a wider range of crops to market, thereby, providing evidence that the effort made to promote income diversification was successful in this region.

Moreover, in the North East, there is little evidence that the higher levels of coffee related income has resulted in long-term improvements in wellbeing, as measured by household asset ownership and other wealth indicators. Nonetheless, there is some evidence that the member producers from this region are investing more in the education of their children. In terms of men's attitudes towards women's economic roles, there is strong evidence of impact in Dondon but not in the North East.

Considerations to enable the programme team to learn from this review include:

- Further investigate the reasons for lack of clear long-term impact in the North East, in spite of the apparent benefit from RECOCARNO membership.
- Review what can be learned from the comparison cooperative in Dondon in terms of bringing benefits to members.
- Consider best how to promote diversification of income sources while simultaneously providing price incentives for investing in the production of coffee.
- Understand why improvements in attitudes towards women's economic roles have been much greater in Dondon than in the North East.

1 Introduction and Purpose

This report documents the findings of the project effectiveness review, focusing on outcomes related to livelihood support.

Oxfam GB has developed a Global Performance Framework (GPF) as part of its effort to better understand and communicate its effectiveness and enhance learning across the organisation. This framework requires programme/project teams to annually report generic output data across six thematic indicator areas. In addition, modest samples of sufficiently mature projects (e.g. those closing during a given financial year) associated with each thematic indicator area are being randomly selected each year and rigorously evaluated. One key focus is on the extent they have promoted change in relation to relevant OGB global outcome indicators.

The following global outcome indicator was endorsed for the livelihoods support thematic area:

- **Percentage of households demonstrating greater income, as measured by daily household expenditure per capita.**

The conceptual underpinnings of this indicator are presented in Section 3 below. The work that took place in the North and North East departments of Haiti in November 2011 was part of an effort to assess progress against this indicator.

This report presents the effectiveness review's findings. Section 2 follows by providing brief background information on the project and the context in which the support is being provided, while Section 3 explains the intervention logic associated with the Livelihoods Project. Section 4, Section 5, and Section 6 follow by presenting the conceptual frameworks underlying the indicators, the impact evaluation design used, and the methods of data collection and analysis, respectively. Section 7 then follows by presenting the results obtained from analysing the collected data. Its subsections include those related to basic descriptive statistics, intervention exposure, and finally the overall differences between the targeted women and the women that were selected as comparators. Section 8 concludes.

2 The Project: Support to Diversification for Coffee Farmers in Northern Haiti

Oxfam GB's project supporting coffee farmers in the North and North East departments of Haiti is implemented by RECOCARNO, a network of coffee-producers' cooperatives. This network was established with Oxfam GB support in 2001, and has been an Oxfam GB partner ever since.

RECOCARNO has eight constituent cooperatives located in the North and North East departments of Haiti, all of which predate RECOCARNO's existence. A key benefit of being a member of one of these cooperatives is having a committed buyer for one's coffee production, subject to meeting certain quality standards. The particular role of the cooperatives is to process the coffee and supply it to RECOCARNO, which sells it on to Fairtrade buyers, primarily in Europe. RECOCARNO's Fairtrade certification entitles it to sell coffee at a premium above international market prices.¹ The prices paid by RECOCARNO to individual coffee producers are set by a representative body in advance of the harvest season each year. This price is normally (subject to RECOCARNO and the cooperatives' cash-flow constraints) paid to the producers at the time they deliver coffee production. Any profit generated by RECOCARNO is then divided among the cooperatives at the end of the financial year, for onward distribution to producers according to the quantity of coffee they supplied. RECOCARNO also supports the cooperatives in providing training and technical support for their members, as well as with access to services such as credit, ploughing and transportation.

RECOCARNO was founded with Oxfam GB support in 2001, and has been an OGB partner ever since.

RECOCARNO's stated objectives are:

- Achieve transparency and members' participation in the cooperatives.
- Increase coffee production and improve quality.
- Encourage diversification into other crops and income-generating activities.
- Encourage women's economic leadership.

Oxfam GB's work in this sector began in 1997, with support to three cooperatives. The network was gradually expanded to cover seven cooperatives, with RECOCARNO being established as the umbrella body in 2001. Oxfam GB's support originally focused on strengthening RECOCARNO as an institution and on assisting it to establish commercial relationships with buyers. In recent years, Oxfam GB support has shifted away from subsidising RECOCARNO's core business activities. For instance, the current Oxfam GB project with RECOCARNO, HAIC15, which began in 2008, is specifically focused on encouraging diversification, in order to reduce dependence on coffee and provide more reliable year-round income. At the same time, RECOCARNO has also begun receiving financial support from other donors, including Oxfam Belgium and Vétérinaires Sans Frontières. Oxfam GB had initially planned to disengage from supporting RECOCARNO during 2010, but support was extended to 2012 in light of disruption caused to RECOCARNO's activities by the major earthquake in Haiti in January 2010 and by floods and droughts in coffee-producing areas. Even with these challenges, and in spite of a particularly poor coffee harvest in 2010, RECOCARNO has been able to maintain its commitment to its members and the level of technical support it provides them.

¹ Details of the premium are discussed in Section 7.2 below.

3 Intervention logic of the support provided

The following diagrams illustrate simple ‘theories of change’ for the project’s key interventions are expected to bring about improvements in household income, as well as improved attitudes towards women’s economic roles.

As described in Section 2, the primary function of the cooperatives is to provide a guaranteed and advantageous price for the members’ coffee production. In Figure 3.1, the left-hand branch demonstrates how this guarantee is intended to provide producers with a secure source of income from their coffee production, which will encourage them to invest more and hence produce higher and more stable household income. At the same time RECOCARNO also supports cooperatives in providing training and technical support to their members on coffee production. This is expected to bolster productivity and, in turn, household income, represented in the right-hand branch in Figure 3.1.

The project aims to increase coffee production and income and diversify income sources, ultimately to both increase and stabilise household income.

Oxfam GB’s current focus is to support RECOCARNO to promote income diversification among its members. The particular activities have involved both the provision of training and technical support in crop diversification and the operation of non-agricultural income-generating activities, particularly for women. As shown in Figure 3.2, success in either or both of these elements is expected to lead to increased and more stable household income.

Figure 3.1

Intervention logic: Coffee-related activities

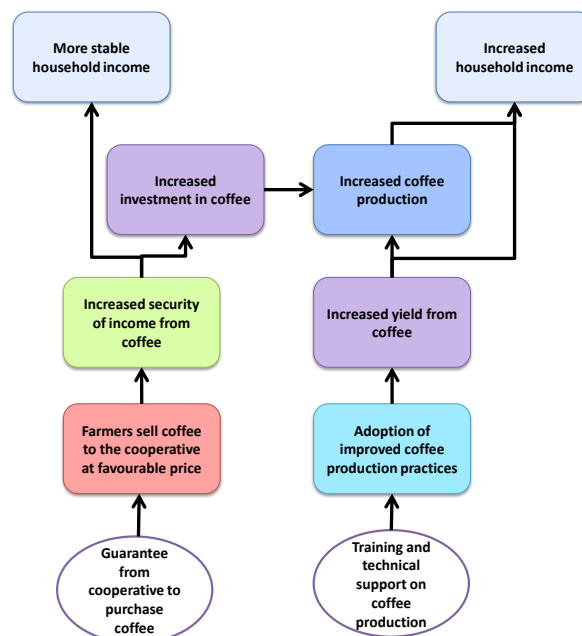
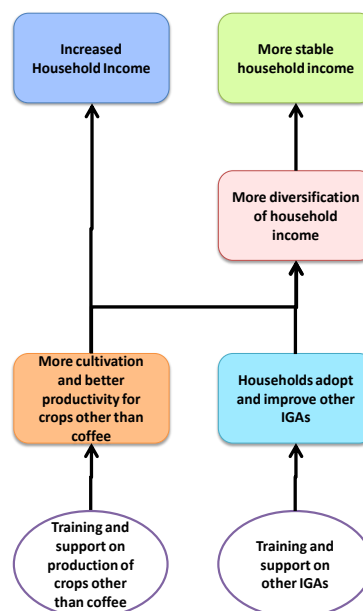


Figure 3.2

Intervention logic: Activities related to diversification

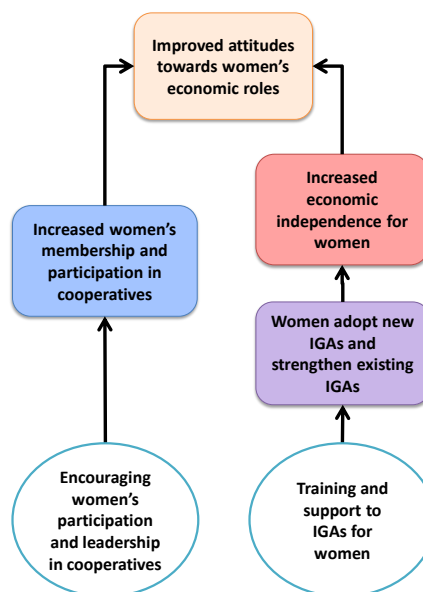


Finally, RECOCARNO has long encouraged women's participation in its member cooperatives. This has resulted in women gaining leadership positions within the cooperatives. The more recent focus – specifically on supporting income-generating activities for women – is intended to reinforce this by improving attitudes towards women's economic roles, as shown in Figure 3.3.

The remainder of this document will evaluate the extent to which Oxfam GB and RECOCARNO have been successful in achieving impact on the lives of coffee producers and their households, in line with these models of change.

Figure 3.3

Intervention log: Women's empowerment activities



4 Impact Assessment Design

4.1 Limitations in Pursuing the Gold Standard

The core challenge of a social impact evaluation is to credibly estimate the net effect of an intervention or programme on its participants. An intervention's net effect is typically defined as the average gain participants realise in outcome (e.g. income) from their participation. In other words:

Impact = average post-programme outcome of participants – what the average post-programme outcome of these same participants would have been had they never participated

This formula seems straightforward enough. However, *directly* obtaining data on the latter part of the equation – commonly referred to as the counterfactual – is logically impossible. This is because a person, household or community cannot *simultaneously* both participate and not participate in a programme. The counterfactual state of a programme's participants can therefore never be observed directly; it can only be estimated.

The randomised experiment is regarded by many as the most credible way of estimating the counterfactual, particularly when the number of units (e.g. people, households, or, in some cases, communities) that are being targeted is large. The random assignment of a sufficiently large number of such units to intervention and control groups should ensure that the statistical attributes of the two resulting groups are similar in terms of a) their pre-programme outcomes (e.g. both groups have the same average incomes); and b) their observed characteristics (e.g. education levels) and unobserved

The aim of the effectiveness review was to estimate the difference that Oxfam GB's support has made to the members of RECOCARNO's cooperatives.

characteristics (e.g. motivation) that affect the outcome variables of interest. In other words, randomisation works to ensure that the *potential outcomes* of both groups are the same. As a result – provided that threats such differential attrition and intervention spill-over are minimal – any observed outcome differences observed at follow-up between the groups can be attributed to the programme.

However, implementing an ideal evaluation design like this is only possible if it is integrated into the project design from the start, since it requires the introduction of some random element that influences participation. To evaluate an ongoing or completed programme – as in this project effectiveness review – or one where randomisation is judged to be impractical, it is therefore necessary to apply alternative techniques to estimate the counterfactual as rigorously as possible.

4.2 Alternative Evaluation Design Pursued

There are several evaluation designs when the comparison group is non-equivalent that can – particularly when certain assumptions are made – identify reasonably precise intervention effect estimates. One solution is offered by matching: find units in an external comparison group that possess the same characteristics, e.g. ethnicity, age, and sex, as those of the intervention group and match them on these characteristics. If matching is done properly, the observed characteristics of the matched comparison group will be identical to those of the intervention group. The problem, however, with conventional matching methods is that, with large numbers of characteristics on which to match, it is difficult to find comparators with similar combinations of characteristics for each of the units in the intervention group. The end result, typically, is that only a few units from the intervention and comparison groups get matched up, thereby not only significantly reducing the size of the sample but also limiting the extent to which the findings can be generalised to all programme participants. (This is referred to as the “curse of dimensionality” in the literature.)

The evaluation design involved comparing members and non-members of the RECOCARNO network, while statistically controlling for observed differences between them.

Fortunately, matching on the basis of the propensity score – the conditional probability of being assigned to the programme group, given particular background variables or observed characteristics – offers a way out. The way propensity score matching (PSM) works is as follows: Units from both the intervention and comparison groups are pooled together. A statistical probability model is estimated, typically through logit or probit regression. This is used to estimate programme participation probabilities for all units in the pooled sample. Intervention and comparison units are then matched within certain ranges of their conditional probability scores. Tests are further carried out to assess whether the distributions of characteristics are similar in both groups after matching. If not, the matching bandwidth or calliper is repeatedly narrowed until the observed characteristics of the groups are statistically similar. Provided that a) the dataset in question is rich and of good quality; b) the groups possess many units with common characteristics (i.e. there is a large area of common support); and c) there are no unobserved differences lurking among the groups, particularly those associated with the outcomes of interest, PSM can produce good intervention effect estimates.

Multivariable regression is another approach that is also used to control for measured differences between intervention and comparison groups. It operates differently from PSM in that it seeks to isolate the variation in the

outcome variable explained by being in the intervention group *net of other explanatory variables* (key factors that explain variability in outcome) included the model. In this way, multivariable regression controls for measured differences between the intervention and comparison group. The validity of both PSM and multivariable regression are founded heavily on the “selection on observables” assumption, and therefore treatment effect estimates can be biased if there are unmeasured (or improperly measures) but relevant differences existing between the groups. Both PSM and multivariable regression were employed during data analysis, and efforts were made to capture key explanatory variables believed to be relevant in terms of the assessed outcomes, including details about the composition of the household and their livelihood activities at baseline.

4.2 Reconstruction of Baseline Data

For propensity-score matching or multivariate regression to work effectively, individual-level data about on the situation of respondents at baseline is required, to control for time invariant differences between the groups. In the case of Oxfam GB’s support to RECOCARNO, no baseline survey had been conducted. Instead, an attempt was made to reconstruct baseline data by asking to respondents to recall certain information about their situation at this time. This was done only for data which respondents can reasonably be expected to recall with some clarity, such as the condition of the house, the ownership of assets and livestock, and the variety of crops produced.

Several of the questions asked respondents about their situation in 2004, enabling the reconstruction of baseline data.

To maximise the reliability of the recalled baseline data, it is important that the period which respondents are being asked to recall can be visualised easily. This can be achieved by identifying a landmark event that all respondents can remember clearly, and asking them details about their situation at this time. Attempts were made to identify such a landmark event between 1997 and 2001 (around the time of the beginning of Oxfam support to these cooperatives and the establishment of RECOCARNO), but with little success. It was decided in the end to use the date of 2004 for the recall period. Everybody in northern Haiti recalls the year 2004 with clarity, since in that year there was a coup d’état and one of the most damaging hurricanes of recent years. While the year of 2004 is obviously a number of years after RECOCARNO was established, it was assumed to be reasonable because most of the interventions described in Section 3 happened after this time. Moreover, most of the cooperative members had joined the cooperatives after this particular year.

4.3 The Comparison Group

A key factor in ensuring the validity of any non-randomised impact evaluation design is to employ an appropriate comparison group. This is particularly true for ex-post, cross-sectional designs. Comparators that differ in relation to the baseline status of the outcome variable(s) of interest and/or who are subjected to different external events and influences will likely result in misleading conclusions about programme impact. Identifying a plausible comparison group is therefore critically important and is generally not an easy task.

The selection of a suitable comparison group was complicated in this case because the beneficiaries of the project are all members of coffee-growers cooperatives. It is very likely that those who have chosen to join a

cooperative are systematically different from those who do not choose to join, in terms of their productive activities, motivation, and other factors. Had non-members of the cooperative been selected as a comparison for the members, it is very likely that the data would have revealed systematic baseline differences between the two groups. Moreover, even if it had been possible to match the groups on the basis of observable characteristics (demographic characteristics and productive activities), the groups may have, nevertheless, differed in relation to those that are unobservable, such as motivation. For this reason, it was seen as important to use as a comparison coffee producers who have chosen to join a local cooperative other than those supported by RECOCARNO and Oxfam.

To this end, the effectiveness review team worked with RECOCARNO and Oxfam staff to identify three cooperatives which are not members of RECOCARNO but are located in areas with similar characteristics. The availability of suitable comparison cooperatives determined the selection of those RECOCARNO member cooperatives that were included in the effectiveness review.

In the North East department, two cooperatives were identified in the municipality of Valières. These cooperatives were judged to be comparable to the RECOCARNO member cooperatives located in the municipalities of Carice and Mont Organisé. One of the two cooperatives in Valières was established only in 2009, and has not yet received significant levels of external support. The second cooperative (APKVAL) was created in 1999. It was a member of national federation of cooperatives until 2008 and joined a new federation (COOPAYMA) in 2010. However, APKVAL has received only limited levels of material and technical support, at a much lower intensity than those given to the RECOCARNO cooperatives.

The third comparison cooperative, COOPAVCOD, is located in the municipality of Dondon, the same municipality as two of the RECOCARNO cooperatives, and it specialises in supplying organic coffee. COOPAVCOD has also received some limited levels of external support over the years, but at a much lower level than those provided to RECOCARNO cooperatives. When RECOCARNO was established, COOPAVCOD considered joining the network but decided against – a decision which appears to have been based more on the personalities involved than on objective factors. It seems fair, therefore, to consider COOPAVCOD's trajectory as a counterfactual for what would have happened in the case of the nearby RECOCARNO cooperatives had RECOCARNO not existed. It certainly appears to be the case that individual coffee producers, if the opportunity to join RECOCARNO-supported cooperatives were not available, would seek to join COOPAVCOD as the comparable alternative. However, the organic certification for COOPAVCOD's coffee production makes this comparison more complicated. This is revisited in Section 7.

The selection of RECOCARNO cooperatives to be included in the effectiveness review was determined by the availability of suitable comparison cooperatives.

No suitable comparison cooperatives were identified in the areas of Plaisance or Bourgne. The four RECOCARNO cooperatives in these two areas were therefore excluded from the effectiveness review.

Table 4.1 summarises the RECOCARNO cooperatives and the comparison cooperatives selected for the effectiveness review. Due to the different characteristics of the North and North East department, statistical matching and comparisons were made only between producers in the same department. The variable 'department' was also specified as a fixed effect in the multivariable regression models used.

Table 4.1: RECOCARNO cooperatives and selection of comparison cooperatives

Department	RECOCARNO cooperative	Municipality	Comparison cooperative	Municipality
North East	COSAHEC	Carice	APKVAL	Valières
	CAFUMO	Mont Organisé	KPKV	Valières
North	CACGAVA	Dondon	COOPAVCOD	Dondon
	KKKLD	Dondon		
	KPKP	Plaisance	none	
	KOPVOCH	Plaisance	none	
	KAPB	Bourgne	none	
	KAPBM	Bourgne	none	

5 Outcome indicators

5.1 Livelihoods outcome indicator

Measuring household wealth or socioeconomic position in low income countries is not straightforward, particularly in rural areas where respondents tend to be self-employed. Self-reported measures of total income are unreliable, given the wide variety of endeavours such populations engage in to generate income.² However, given that there is a widely recognised and strong association between household income and consumption,³ one popular proxy measure used by the World Bank and other international institutions involves the aggregation of both household consumption and expenditure data.⁴ To capture data on this indicator, a household survey is administered that contains a consumption and expenditure module. The respondents are asked what types of food they consumed over the previous seven day period, as well as the particular quantity. The quantity is transformed into a monetary value, i.e. either how much they paid for the food item in question or, if the food item was from their own production, how much they would have paid if it was bought from the local market. The respondents are also asked how much they spent on particular regular non-food items and services from a list such as soap, toothpaste, and minibus fares over the past four weeks. Finally, they are asked for any household expenditure on non-regular non-food items such as school and hospital fees, clothes, and home repair over the last 12 months. For non-food items that are gender divisible, data are collected in a gender-disaggregated fashion, thereby enabling intra-household consumption inequality to be measured as well. The household expenditure measure is calculated by converting each of the expenditure types into a per-day figure and adding them together.

While dividing the above equation by household size as the overall denominator is recommended in the literature, using a more nuanced calculation is deemed important to avoid underestimating the wealth status of larger sized households relative to their smaller counterparts. The formula used for calculating household size is

where A is number of adults in the household; K is the number of children; $\frac{C}{A}$ is the consumption of a child relative to an adult; and α stands for the extent

Respondents were asked to recall the types and quantities of food consumed in the household during the previous week, as well as how much they spent on various non-food items.

² Morris, Saul, Calogero Carletto, John Hoddinott, and Luc J. M. Christianensen. (1999) *Validity of Rapid Estimates of Household Wealth and Income for Health Surveys in Rural Africa: FCND Discussion Paper No. 72*. Washington: International Food Policy Research Institute.

³ See Gujarati, Damodar N. (2003) *Basic Econometrics: Fourth Edition*. New York: McGraw Hill.

⁴ Deaton, A and S. Zaidi. 2002. "Guidelines for constructing consumption aggregates for welfare analysis," Working Paper No. 135. The World Bank, Washington, D.C.

of economies of scale. This evaluation follows the common practice of setting equal to 0.33 and equal to 0.9,⁵ but the findings are not sensitive to reasonable changes in these parameters.

The expenditure variable is normally then converted to a logarithmic scale, to improve the model fit in regression analysis and reduce the influence of outliers. The resulting variable can remain continuous, and the average per capita consumption and expenditure can be calculated for the sample in question. It can also be transformed into a binary variable, so that the proportion of households living above a certain monetary figure can be calculated. For the Oxfam GB global indicator for livelihoods, the median expenditure level of the comparison group is used as the benchmark for creating the binary variable.

5.2 Other outcome measures

As reviewed in Section 3 above, the support provided to the targeted households is intended to bring about a number of other outcomes, in addition to strengthening livelihoods. Given this, data were collected on a number of additional outcome measures. These include those relating to household ownership of assets, agricultural production, household food security and change in use of water and sanitation facilities.

Self-reported income change

Respondents were asked to make a judgement whether overall their income had increased, remained the same or decreased since 2004.

Ability to meet basic needs

Respondents were presented with the following four descriptions of household economic situations, and asked which matched their own situation most closely:

- Doing well: able to meet household needs by your own efforts, and making some extra for stores, savings, and investment.
- Breaking even: Able to meet household needs but with nothing extra to save or invest.
- Struggling: Managing to meet household needs, but depleting productive assets and/or sometimes receiving support.
- Unable to meet household needs by your own efforts: dependent on support from relatives living outside of your household or the community, government and/or some other organisation – could not survive without this outside support.

Household food security

Household food security was measured using six questions adapted from the Household Food Insecurity Access Scale (HFIAS) developed by USAID's Food and Nutrition Technical Assistance (FANTA) Programme.⁶

Respondents were asked whether any of the following were true for them or other members of their household in the four weeks before the date of the survey:

- Did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?

Household expenditure data were supplemented with indicators of income change, ability to meet the household's basic needs, and food security.

⁵ Ibid.

⁶ http://www.fantaproject.org/publications/hfias_intro.shtml

- Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?
- Did you or any household member have to eat fewer meals in a day because there was not enough food?
- Was there ever no food to eat of any kind in your house because of lack of resources to get food?
- Did you or any household member go to sleep at night hungry because there was not enough food?
- Did you or any household member go a whole day and night without eating anything because there was not enough food?

For each question which was answered positively, the respondent was then asked how frequently this situation occurred during the four weeks. A score was generated based on the frequency of these events.

Data were also gathered to enable analysis of how a household's ownership of assets has changed since 2004.

Household ownership of assets

Household consumption and food security tend to provide good indications of the household's current economic situation, but in low-income contexts they tend to be influenced strongly by current or very recent income patterns. These measures may not, therefore, fully reflect any long-term economic benefits from membership of a RECOCARNO cooperative. In order to provide a better measure of more established household wealth status, the survey also asked households about their ownership of livestock, household assets, and about the condition of their homes. The full list of assets and other wealth indicators which were collected in the survey is shown in Table 5.1.

Table 5.1: List of assets and other wealth indicators used to derive asset index

Livestock	Agricultural equipment	Household goods	Vehicles
Cattle	Wheelbarrow	Watch or clock	Bicycle
Goats	Hoes	Table	Motorcycle
Sheep	Machete	Bed	Car or motor vehicle
Pigs	<i>Koulin</i>	Lamp (electric or gas)	
Donkeys	<i>Sepet</i>	Iron (electric or coal)	Condition of house
Horses	Spade	Sewing machine	Walls
Poultry	Sickle	Jewellery	Roof
	Plough	Mobile phone	Floor
Property	Pick	Radio/cassette/CD player	Fuel used for cooking
Ownership of house	Shovel	Video/DVD player	Type of toilet
Ownership of land where the house is located	Secateurs	Solar panel	Whether house is newly built since 2004
Ownership of farmland		Generator	Electricity connection
		Refrigerator	

Respondents were asked about their ownership of these assets both at the time of the survey and in 2004. Survey piloting confirmed that respondents generally seemed able to recall this information from 2004 with a reasonable level of confidence.

Principal component analysis (PCA) was used to create a weighted index of asset ownership for 2004, and a further index of changes in asset ownership since 2004. PCA is a data reduction technique that narrows in on the variation in household asset ownership, which is assumed to represent wealth status. The more an asset is correlated with this variation, the more weight it is given. Hence, each household's weighted score is determined by both a) the number of assets its owns; and b) the particular weight assigned to each

asset. This enables the relative wealth status of the households to be compared.

Agricultural production and sales

Respondents were asked about their production and sales of all crops, including coffee, both in 2004 and in the 12 months prior to the survey. For the current year, respondents were asked to estimate their total income from each crop type, and, in the case of coffee, to what type of vendors they had sold their production.

Since the survey was conducted during the 2011 coffee harvest season, full details on household production of and income from coffee for 2011 were not yet available, so questions on coffee production and sales related instead to the 2010 harvest. Even though the coffee harvest in the region in 2010 was particularly poor, the overwhelming majority of the respondents (97 per cent of members of RECOCARNO cooperatives) reported producing at least some coffee that year, so data from that harvest can be analysed.

Harvests for crops other than coffee vary in timing and frequency, so respondents were asked only to report their total income during the 12 months prior to the survey. As well as providing important details about household coffee production, the data relating to other crops give an important indication of the degree of diversification of agricultural activities among the surveyed households.

Other productive activities

In order to provide a fuller picture of the diversification of income sources within their household, respondents were asked about the economic activities which each member of their household engages in.⁷ They were also asked to estimate the proportionate contribution of each activity to total household income, both currently and in 2004. This was facilitated by showing respondents a sheet with images of various sources of income, and asking them to allocate 20 stones between the sources according to their situation.

Attitudes to women's roles

Although evaluating success of the women's economic leadership activities was not a focus of this effectiveness review, a series of questions was included in the survey to give some indication of whether there was impact on this area. In particular, the respondents were asked to state the extent of their agreement or disagreement with each of these statements:

- The only really satisfying role for a woman is as a wife and mother.
- Women are as important as men in ensuring that the basic material needs of families are met.
- Girls should be encouraged to be ambitious in terms becoming economically independent when they reach womanhood.
- Women are not suited for work of great stress and responsibility.
- Women's livelihood work is equally as important as their domestic work.

Details were collected on respondents' production and sales of coffee and other crops, both in 2004 and in the 12 months prior to the survey.

⁷ In the analysis in Section 7, formal salaried employment is treated as a fixed characteristic of households, which is unlikely to have been affected by the Oxfam project, and so is controlled for in the various statistical models. Indicators of other productive activities are all considered as potential outcomes, which could have been affected by the project activities. (This is particularly so in the case of engagement in non-agricultural household businesses, the results for which are examined in Table 7.10.)

A short component of the survey examined male and female respondents' attitudes towards women's economic roles.

- A man should be responsible for providing money for his wife's personal use even if she is capable of earning it herself.
- Women's most important job is to look after the comforts of men and children.
- Households in our community would be much poorer if women stopped doing livelihood work.
- A situation where a woman spends the majority of her day away from the home to make money is not right.
- If a child falls ill, it is the mother's duty rather than the father's to take time away from productive activities to look after him or her.
- The saying "a woman's place is to take care of the home" is generally correct.
- A woman can be a good wife and mother even if she is involved in demanding livelihood activities.
- Women should worry less about their rights and more about becoming good wives and mothers.
- In general, women are equally capable of contributing to economic well-being than are men.
- If a woman gets too involved in livelihood activities, her family will likely suffer.

As is apparent, some of these statements are presented in a positive sense and some in a negative sense. During data analysis, the responses to the negative phrases were inverted, and points were awarded according to the extent of agreement or disagreement with each phrase. Rather than simply using the raw scores as the bases of the gender attitudes measure, principal factor analysis was carried out on the 15 items to generate factor indices. This technique focuses on the variation in the data that is common in the responses, so reducing the amount of "noise" in the data. This increases precision to identify significant differences in attitudes.

5.3 Measuring intervention exposure

To assess progress along the steps in the intervention logic models described in Section 3, it was necessary also to measure the extent to which the respondents were exposed to different types of support targeted at the households. As such, the respondents were asked which forms of support or training they had received during the 12 months prior to the survey, and whether each of these forms of support had come from the cooperative or from some other source.

6 Methods of Data Collection and Analysis

6.1 Data Collection

The effectiveness review team designed a household questionnaire to capture data on both the outcome variables presented in Section 5 above, as well as other key characteristics of the targeted and comparison producers. The questionnaire was piloted by the team, and then extensively tested during the training of enumerators. Eighteen potential enumerators participated in a two-day training workshop, which included a practical exercise that involved administering the questionnaire to coffee producers in a test community. Based on their performance in this exercise, 15 enumerators were selected to carry out the field work.

The statistical techniques used required the interviewing of more members of comparison cooperatives than members of RECOCARNO cooperatives.

Membership lists were provided by all seven of the cooperatives included in the survey, from which respondents were chosen at random. To ensure an adequate sample size to evaluate effects in the two departments separately, 120 producers from RECOCARNO producers were selected in the North department and 120 in the North East department. Within each department, the proportions selected from each RECOCARNO cooperative and the proportion of males and females was made using proportionate stratified sampling.

Since the unmatched comparison data are given less weight in PSM than the data from intervention sites, it is advantageous to have larger sample sizes for the comparison group. To that end, the comparison cooperatives, the field staff were given a target of 180 interviews in the North East department and 180 in Dondon. Since it was not possible to sort the membership lists of these cooperatives by gender, the gender balance in the sample could not be controlled for. However, since each cooperative had a reasonably large number of female members, random selection resulted in an appropriate gender balance (45 per cent of the sample of RECOCARNO members were female, compared to 41 per cent of the sample of comparison households).

In the event, it was not possible to achieve the full targets for the numbers of comparison respondents. In the North East department, the 120 members of RECOCARNO cooperatives were interviewed and 135 from the comparison cooperatives. In Dondon, 121 members of the RECOCARNO cooperatives were surveyed, but only 120 from the comparison cooperative.

In the municipality of Dondon, a small number of producers were found to be members of more than one cooperative. Those who were members of both a RECOCARNO cooperative and of the comparison cooperative (COOPAVCOD) were eliminated from the sample and replaced with an alternative respondent from the replacement list.

6.2 Data Analysis

OGB developed data entry tools in Adobe Acrobat Pro, and the Consultant recruited and supervised data entry clerks to enter the data. After identifying and rectifying some minor errors in MS Excel, the data were then imported into Stata for analysis, the results of which are presented in the following sections. The analyses involved group mean comparisons using *t*-tests, propensity-score matching (PSM) with Stata's *psmatch2* module, and various regression approaches. Kernel and nearest neighbour matching without replacement were the main methods used in implementing PSM. Variables used in the matching process were identified by first using backwards stepwise regression to identify those variables that are correlated with the outcome measure of interest at a *p*-value of less than 0.25. The short-listed variables were then put into another stepwise regression model to identify those that are correlated with being a member of the intervention group. Covariate balance was checked following the implementation of each matching procedure. When covariate imbalance was identified at *p*-values of 0.25 or less, the bandwidth or calliper was reduced and the PSM procedure and covariate balance test implemented again. This was continued until all covariates were balanced at *p*-values greater than 0.25. Boot-strapped standard errors enabled the generation of confidence intervals to assess the statistical significant of the effect sizes. The covariates, as presented in Table 7.1 below, were included in the various regression approaches undertaken, i.e. regression with robust standard errors, robust regression (to reduce the

influence of outliers), and regression with control functions (to attempt to control for unobserved differences between the intervention and comparison groups).

There are large differences between the economic environments in the North East department – where the cooperatives are located in very rural areas – compared to Dondon, which is located within one hour's drive of Cap-Haïtien, a major city. These contextual differences can be observed as large differences in the level of household consumption and wealth in the two departments. For this reason, all the analysis in Section 7 is conducted for Dondon and for the North East separately. In the “overall” results in Section 7, the results from the two areas are weighted equally. In fact this does not give a perfect overview of the project because the cooperatives in the North East have (according to the most recent membership lists, which were used to select the interview sample) total membership approximately 50 per cent larger than those in Dondon. Since data were not collected in the other four RECOCARNO cooperatives in the North department, this effectiveness review cannot make conclusions about the effectiveness of the project as implemented in those cooperatives.

6.3 Main Problems and Constraints Encountered

Overall, despite the usual hardships encountered when undertaking such intensive work, the data collection process went well. However, several challenges were encountered. These include:

- *Significant differences observed between the intervention and comparison groups.* As is presented in Section 7.1 below, the comparison women interviewed in the comparison group are different, on average, in relation to several of the variables. While these observable differences were controlled for during data analysis, it is likely that there are unobserved differences between the intervention and comparison groups as well. The effect estimates presented in Section 7.3, therefore, must be interpreted cautiously.
- *Low number of comparison respondents.* As described in Section 4.2, the use of propensity-score matching benefits from having a larger number of comparison observations than intervention observations. This is particularly the case when there are large systematic differences between the intervention and comparison groups, as in this case. In this survey, the shortage of comparison observations, combined with the systematic differences between the groups, has reduced the statistical power and the valid range of many of the tests. As a consequence, many of the estimates derived from PSM models in the North East department apply only to a subset of the intervention group. In some cases around a third of the intervention group have been excluded from the analysis; the estimated differences in the outcome measures apply only to those who are included. However, it should be noted that in calculating effects on the key output measures of household expenditure, food security and change in the asset index, only 10 to 15 per cent of the intervention group were excluded.

7 Results

7.1 General Characteristics

Table 7.1 presents mean statistics for general household characteristics obtained through the administration of the questionnaire among the sampled women from both the intervention and comparison groups. The stars beside the number indicate differences between the two groups that are statistically significant at a 90 percent confidence level or greater.

As is evident, there are several statistically significant differences between the groups, particularly in the North East department:

- *Location of the household*, measured as distance from community facilities (such as the cooperative's collection centre). It is clear that, in the North East, the members of the comparison cooperatives are on average located further from the centre of the community than the members of the RECOCARNO cooperative. In Dondon, the comparison households are on average closer to the centre of the community, though this difference is less pronounced.
- *Household structure*: In the North East, households of members of RECOCARNO cooperatives have more unproductive adult members (e.g. elderly or chronically sick members) than the comparison cooperatives. They are also more likely to be composed solely of elderly adults and more likely to be female headed.
- *Employment*: Households of members of RECOCARNO cooperatives are significantly more likely to have employment outside agriculture than the comparison cooperatives. In the North East this applies to salaried employment, and in the North to self-employment in trades such as mechanics and carpentry.
- *Education level*: Household heads in RECOCARNO cooperatives in the North East are significantly more likely to have some secondary education than those in comparison cooperatives.
- *Asset wealth in 2004*: Using the asset index constructed as described in Section 5.2, members of RECOCARNO cooperatives in the North East were significantly more wealthy at baseline (in 2004) than those in the comparison cooperatives. In Dondon, fewer of the members of the RECOCARNO cooperatives are in the middle third in terms of asset wealth than the comparison cooperative. In particular, they tend to have a wider range than members of the comparison group. (Of course, it is possible that this difference is at least partly due to RECOCARNO's support prior to 2004. However, given that we do not have an earlier baseline, we cannot evaluate that with this dataset.)
- *Agricultural production in 2004*: Members of RECOCARNO cooperatives in the North East were farming less land in 2004 than members of the comparison cooperatives. While, they were producing more coffee, they were producing fewer other crops at that time. In Dondon, members of RECOCARNO cooperatives were deriving a small proportion of their income from coffee and more from livestock products in 2004 than members of comparison cooperatives.
- *Remittances*: Only a small minority of respondents reported receiving income transfers or remittances in 2004, but in the North East this proportion was three times greater among members of RECOCARNO cooperatives than among members of comparison households (3.2 per cent, compared to 0.9 per cent).

The beneficiaries and comparison respondents were found to be different in a number of important respects.

All of these factors are likely to have some affect on a household's income and productive activities. It will therefore be very important to control for these factors when making assessments of impact in Section 7.3.

Table 7.1:
Descriptive statistics for intervention and comparison respondents

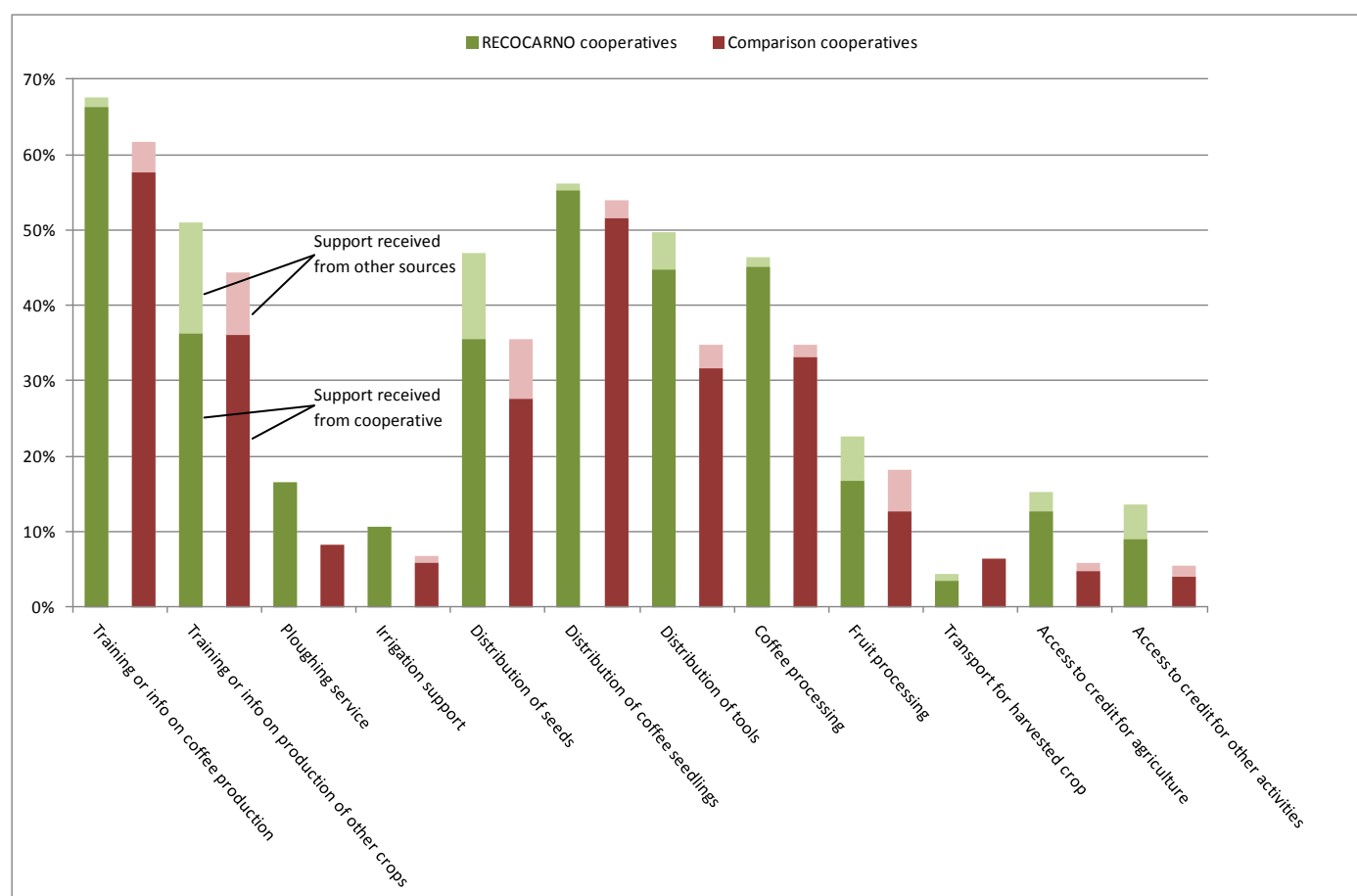
	Intervention mean	Compar. mean	Overall		Dondon		North East	
			Difference	t-statistic	Difference	t-statistic	Difference	t-statistic
Household size	5.255	4.965	0.291	1.34	0.250	0.85	0.370	1.18
Number of adults	3.364	3.244	0.120	0.87	0.175	0.89	0.065	0.33
Number of children	1.887	1.720	0.167	0.97	0.075	0.35	0.297	1.14
Number of productive adults	2.845	2.835	0.011	0.09	0.217	1.17	-0.194	-1.22
Number of unproductive adults	0.519	0.409	0.109	1.38	-0.042	-0.39	0.259**	2.24
Household head female	0.205	0.167	0.038	1.08	-0.007	-0.14	0.078*	1.69
Household head > 60 years old	0.366	0.362	0.003	0.08	-0.017	-0.26	0.018	0.30
Household head < 18 years old	0.000	0.000	0.000	.	0.000	.	0.000	.
Age of household head	56.542	56.878	-0.336	-0.28	-2.517	-1.41	1.712	1.06
Only one adult in household	0.038	0.039	-0.002	-0.10	0.000	0.00	-0.003	-0.11
All household members > 60 years old	0.067	0.059	0.008	0.36	-0.058*	-1.87	0.071**	2.33
HH head has some primary education	0.494	0.508	-0.014	-0.31	-0.058	-0.90	0.026	0.41
HH head has some secondary education	0.138	0.094	0.044	1.51	-0.025	-0.58	0.107***	2.84
Some HH member has formal employment	0.230	0.106	0.124***	3.73	0.092*	1.86	0.153***	3.43
Some HH member engages in a trade	0.364	0.303	0.061	1.43	0.167***	2.74	-0.042	-0.71
Number of members of the cooperative	1.314	1.343	-0.029	-0.57	0.008	0.11	-0.063	-0.98
Number of years of membership	17.709	13.447	4.262***	4.53	-2.086	-1.52	10.101***	8.82
Asset index 2004	0.261	-0.233	0.494**	2.13	0.031	0.09	0.919***	3.00
Asset poorest third in 2004	0.280	0.339	-0.058	-1.40	-0.008	-0.14	-0.105*	-1.80
Asset middle third in 2004	0.264	0.350	-0.087**	-2.09	-0.125**	-2.12	-0.050	-0.86
Asset wealthiest third in 2004	0.356	0.260	0.096**	2.31	0.033	0.56	0.156***	2.70
Distance to the cooperative centre	49.148	72.186	-23.038***	-4.90	2.371	0.38	-46.377***	-7.11
Distance to nearest market	49.996	71.335	-21.339***	-4.36	8.494	1.34	-48.600***	-7.16
Distance to nearest clinic	57.637	74.201	-16.564***	-3.14	13.857*	1.94	-44.364***	-6.19
Plots farmed in 2004	3.640	3.925	-0.285	-1.60	-0.021	-0.08	-0.518**	-2.03
Acres farmed in 2004	1.876	2.537	-0.661***	-4.01	-0.167	-0.98	-1.095***	-4.05
Produced coffee in 2004	0.950	0.886	0.064**	2.58	-0.050*	-1.66	0.170***	4.52
Quantity of coffee produced in 2004	107.878	99.850	8.028	0.22	-10.160	-0.14	19.962*	1.87
Sold coffee to coop in 2004	0.891	0.780	0.112***	3.36	-0.083*	-1.96	0.293***	6.15
Number of other crops produced in 2004	15.502	17.287	-1.785***	-3.69	-0.358	-0.51	-2.998***	-4.78
Proportion of household income in 2004 from:								
Sale of coffee	0.325	0.308	0.016	1.12	-0.042**	-2.05	0.070***	3.53
Sale of other crops	0.289	0.353	-0.064***	-4.57	-0.027	-1.36	-0.098***	-4.96
Sale of livestock	0.088	0.080	0.008	0.81	0.025	1.51	-0.008	-0.61
Sale of livestock products	0.018	0.017	0.001	0.30	0.019***	2.98	-0.016***	-3.04
Fishing	0.001	0.003	-0.002	-1.11	-0.001	-0.98	-0.002	-0.77
Commerce/small business	0.121	0.127	-0.005	-0.45	-0.004	-0.23	-0.007	-0.46
Casual labour	0.039	0.032	0.007	0.90	0.004	0.67	0.011	0.89
Trade or craft	0.046	0.029	0.016*	1.96	0.031***	3.06	0.003	0.26
Formal employment	0.028	0.017	0.011	1.43	-0.002	-0.19	0.023**	2.20
Renting out livestock	0.002	0.001	0.001	0.89	0.001	1.01	0.001	0.52
Renting out land	0.004	0.006	-0.002	-0.73	-0.003	-0.68	-0.001	-0.37
Remittances and transfers	0.030	0.026	0.004	0.48	-0.018	-1.41	0.023***	3.20
Observations	239	254	493		240		253	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

7.2 Intervention exposure

The respondents were asked a number of questions about the support they have received from their cooperative and from other organisations in the previous 12 months. Figure 7.1 and Table 7.1 show the proportion of respondents in the RECOCARNO and the comparison cooperatives who reported having received the various types of support provided by RECOCARNO.

Figure 7.1: Proportion of surveyed households receiving support from external organisations



Members of RECOCARNO cooperatives report receiving significantly more support from their cooperative than do members of comparison cooperatives.

There is little or no difference between the RECOCARNO cooperatives and comparison cooperatives in terms of the proportions of members who have received training or technical support, in the production coffee or other crops, or the receipt of seedlings for growing coffee. It is clear that some other important forms of support are more widespread in the RECOCARNO cooperatives than in the comparison cooperatives. However, the right-hand two columns of Table 7.1 show that most of these differences (distribution of tools, access to credit, and use of a ploughing service and mobile irrigation) apply only in the North East department. In Dondon, there is evidence that members of RECOCARNO cooperatives were more likely to have received distributions of seeds than their counterparts in the comparison cooperatives, but the other differences are not significant.

These figures show only the proportion of members who have had access to each service during the year, and do not provide information about the intensity of provision or quality of each service.

Table 7.2: Differences in support received from the cooperative in the 12 months previous to the survey

	Intervention mean	Comparison n mean	Overall Difference	t-statistic	Dondon Difference	t-statistic	North East Difference	t-statistic
Training or info on coffee production	0.662	0.577	0.085*	1.95	0.087	1.41	0.080	1.29
Training or info on production of other crops	0.363	0.360	0.003	0.07	0.045	0.73	-0.035	-0.58
Ploughing service	0.165	0.083	0.083***	2.80	0.070	1.45	0.090***	2.66
Irrigation support	0.106	0.059	0.047*	1.91	0.045	1.09	0.046*	1.66
Distribution of seeds	0.356	0.277	0.079*	1.89	0.152**	2.48	0.008	0.13
Distribution of coffee seedlings	0.553	0.516	0.037	0.82	0.094	1.46	-0.019	-0.30
Distribution of tools	0.447	0.316	0.131***	2.99	-0.034	-0.52	0.272***	5.14
Fruit processing	0.167	0.126	0.041	1.27	0.070	1.47	0.011	0.26
Transport for harvested crop	0.034	0.063	-0.029	-1.48	0.001	0.03	-0.058**	-2.14
Access to credit for agriculture	0.127	0.047	0.080***	3.18	0.062	1.55	0.095***	3.06
Access to credit for other activities	0.089	0.040	0.049**	2.25	0.043	1.16	0.053**	2.16
Observations	239	254	491		238		253	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

One of the most important benefits to membership of a cooperative, of course, is that the cooperative purchases the coffee produced by individual farmers and markets it on their behalf. The important advantage which membership in RECOCARNO can bring to cooperatives in this respect is its approval to supply coffee under the Fairtrade mark, which results in a price premium. The Fairtrade standard results in a premium of 20 US cents per pound of coffee over the market price, and a minimum price of 140 US cents per pound. All else being equal, it should be possible to observe members of RECOCARNO cooperatives receiving this premium for their coffee production. In the survey, data were collected on the sale of all coffee produced in the 2010 harvest. Since the international market price throughout 2010 and 2011 was greater than the minimum of 140 cents per pound⁸, we would expect to observe only a small per-unit premium (of 20 cents per pound or less) in the RECOCARNO cooperatives.

The price paid to coffee producers by RECOCARNO cooperatives in the North East is much higher than the comparison cooperatives – but in Dondon the price paid by the RECOCARNO cooperatives is the same or lower than the comparison cooperative.

Table 7.3 examines the total price producers reported receiving for each *marmite* of coffee which they sold to the cooperative during the 2010 coffee farming season. While RECOCARNO members overall receive a higher price than in the comparison cooperatives, there is a large difference between the two departments. In the North East, the price paid by the RECOCARNO cooperatives is much higher than that paid by the comparison cooperatives (81 gourdes per *marmite*, compared to 37 gourdes per *marmite*). This difference is far larger than can be accounted for by the Fairtrade premium, and is likely to imply differences in the quality of the coffee produced by those in the RECOCARNO cooperatives and the comparison cooperatives. It should be noted that it is possible that the RECOCARNO members have also invested more in the quality of their production over the years, so this price surplus does not necessary imply a net income gain for producer households.

In the municipality of Dondon we do not observe such a positive difference in price paid for coffee. In fact, the estimate of the price paid in the RECOCARNO cooperatives is lower than that in the comparison cooperative, although this difference is not statistically significant. This very likely reflects the fact that the comparison cooperative in Dondon supplies only organic coffee, which commands a higher price. Of course, in the case of organic production, it is possible that the certification process and maintaining the organic standard impose higher costs on producers. Consequently, it is quite

⁸ The Fairtrade price is graphed against the New York market price for Arabica coffee for recent years here: http://www.fairtrade.org.uk/includes/documents/cm_docs/2011/A/1_Arabica%20Price%20Chart%2089-11.pdf

possible that the members of the RECOCARNO cooperative realise greater *net* income from their coffee production even if the price paid is equal or lower.

Table 7.3: Per-unit price for coffee sold in 2010 (Haitian gourdes per *marmite*)

	Observations	Intervention mean	Comparison n mean	Overall Difference	t-statistic	Dondon Difference	t-statistic	North East Difference	t-statistic
Coffee sold through the cooperative	414	85.588	75.851	9.736	1.39	-11.433	-1.03	43.681***	7.70
Coffee sold to other buyers	71	51.321	43.806	7.515	0.77	37.550	1.55	-14.604*	-1.92

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The raw price data, then, does not allow us to make any assessments about how RECOCARNO's collective marketing activities affect household income of coffee producers. This survey did not collect data on costs of production, so it is not possible to estimate net income from coffee directly. In any case, during 2010 and 2011 the market price for coffee has been well above the Fairtrade floor price, so the premium derived from Fairtrade production is probably small. During most years of RECOCARNO's existence, however, the market price has been below the Fairtrade floor price, and so the premium for Fairtrade production should be much larger. If members of RECOCARNO cooperatives have benefited from this premium over several years, we should expect to see a difference in their wealth indicators now. To this end, indicators of household consumption and wealth will be examined in Section 7.3.3.

Price differentials probably reflect differences in the quality of coffee produced as well as the Fairtrade premium paid by RECOCARNO.

The survey also collected data on coffee from the 2010 harvest which producers sold to purchasers other than the cooperative (in markets or to independent traders). The price received for sales outside the cooperative is much lower than that sold through the cooperative: an average of 47 Haitian gourdes per *marmite*, rather than 81 gourdes per *marmite* from the cooperative. Again, this is a much larger difference than can be accounted for by the Fairtrade premium alone. It is likely that the price difference at least partially reflects that coffee sold outside the cooperative does not meet the quality standards required for sale to the cooperative.

7.3 Evidence of impact on outcome measures

7.3.1 Coffee production

Table 7.4 shows an analysis of the quantity of coffee produced (in *marmites*) per producer household in 2010. The upper section of the table shows the raw unadjusted differences in the values. The second section uses two different forms of propensity-score matching, and the third section uses three different regression models, to provide various treatment effect estimates. While 2010 was a particularly difficult year for coffee production, with harvests much lower than normal, the average production figures are great enough that patterns can be seen. In particular, production appears to be slightly higher in the RECOCARNO cooperatives in the North East department than in the comparison cooperatives, though under most of the statistical models, the estimates are not statistically significant. In the cooperatives in Dondon the estimates of the relationship are negative, but are also not statistically significant.

There is, then, no evidence that coffee production is higher overall among members of RECOCARNO cooperatives than comparison cooperatives.

However, it is still possible that productivity could be higher among beneficiaries than non-beneficiaries. We cannot test this directly, since data on farming inputs were not collected. In any case, higher productivity will result in higher household income, if not through increased production, then through decreased costs of production. Whether there is such an effect on household income will be examined in section 7.3.3.

Table 7.4: Quantity of coffee produced by the household in 2010 (marmites)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	66.169	85.724	47.696
Intervention mean	70.565	88.525	52.605
Comparison mean	62.049	82.946	43.336
Unadjusted difference	8.516 (1.06)	5.579 (0.43)	9.269 (1.03)
Observations:	492	239	253
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	9.285 (1.31)	-1.357 (-0.12)	19.472** (2.26)
Observations:	481	231	250
Post-matching difference (no replacement)	-0.098 (-0.01)	-1.857 (-0.16)	8.403 (0.81)
Observations:	436	231	205
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	9.073 (1.28)	-5.360 (-0.47)	14.735* (1.80)
Observations:	440	211	229
MVR coefficient (robust regression)	-0.289 (-0.10)	-12.462* (-1.94)	1.766 (0.54)
Observations:	439	210	229
MVR coefficient with control functions (robust SE)	8.297 (1.16)	-5.532 (-0.48)	7.838 (1.04)
Observations:	440	211	229

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Members of the RECOCARNO cooperatives in the North East produce significantly more coffee than members of the comparison cooperatives.

The left-hand branch of the change model in Figure 3.1 deals with the collective marketing element of the cooperative's activity and the guaranteed purchase arrangement which applies in the RECOCARNO cooperatives. We have seen in Table 7.3 that the per-unit price paid to cooperative members for coffee in 2010 was clearly higher in RECOCARNO cooperatives in the North East than in the comparison cooperatives, but that the same does not apply in Dondon. Table 7.5 investigates whether farmers in the RECOCARNO cooperatives also sold a higher proportion of their production to the cooperative rather than other sources.

Table 7.5 shows clearly that most (92 per cent) of the coffee produced by members of both the RECOCARNO and comparison cooperatives is sold through the cooperative. This suggests that most of these cooperatives are fulfilling their role of purchasing and marketing coffee production effectively. In the North East, however, members of the comparison cooperatives sell a significantly lower proportion of their production through the cooperative. An examination of the disaggregated data (not shown here) revealed that the difference is due to the newly-established cooperative. Specifically, only 44 per cent of the coffee produced by members was sold through this cooperative in 2010. It may even be that some of the members of the new cooperative did not have the right to sell through the cooperative in 2010 (20

out of 45 members of that cooperative report having joined it only in 2010 or 2011). However, in any case, as we have already seen, the comparison cooperatives in the North East paid a much lower price for coffee in 2010 than the RECOCARNO cooperatives, so it is to be expected that fewer of the members would sell to them.

Table 7.5: Proportion of 2010 coffee production sold to the cooperative

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.917	0.993	0.835
Intervention mean	0.938	0.944	0.931
Comparison mean	0.895	1.043	0.731
Unadjusted difference	0.043	-0.099	0.200***
	(0.81)	(-1.13)	(3.53)
Observations:	454	234	220
<i>PSM (ATT)</i>			
Post-matching difference	0.045	-0.098	0.204***
(kernel)	(0.78)	(-1.19)	(2.72)
Observations:	438	234	204
Post-matching difference (no replacement)	0.020	-0.099	0.229***
	(0.37)	(-1.15)	(4.10)
Observations:	400	234	166
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.049	-0.094	0.268***
	(0.76)	(-0.95)	(3.61)
Observations:	406	207	199
MVR coefficient with control functions (robust SE)	0.045	-0.097	0.261***
	(0.68)	(-0.96)	(3.57)
Observations:	406	207	199

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

In the North East, members of RECOCARNO cooperatives were also selling larger proportions of their coffee production through their cooperative.

Table 7.6 shows the total reported household revenue from coffee in 2010, including coffee sold both to the cooperative and outside the cooperative. As we would expect based on the higher price paid, revenue from coffee is much higher in the RECOCARNO cooperatives in the North East than in the comparison cooperatives. In Dondon the members of the RECOCARNO cooperatives appear to be generating less revenue from coffee than members of the comparison cooperatives, though this result is only marginally statistically significant. It should be remembered that these figures are for revenue only: they do not imply effects on net household income because costs of production have not been taken into account. A more complete picture will be presented by examining household wealth directly in Section 7.3.3.

Only members of the RECOCARNO cooperatives in the North East generate significantly more income from sales of coffee than members of the comparison cooperatives.

Table 7.6: Household income from coffee in 2010 (natural logarithm of Haitian gourdes)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	7.883	8.370	7.356
Intervention mean	7.977	8.250	7.702
Comparison mean	7.785	8.486	6.972
Unadjusted difference	0.192 (1.58)	-0.236 (-1.50)	0.730*** (4.85)
Observations:	439	228	211
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.215** (2.04)	-0.234 (-1.47)	0.657*** (4.93)
Observations:	436	225	211
Post-matching difference (no replacement)	0.188 (1.44)	-0.258* (-1.66)	0.678*** (3.87)
Observations:	429	225	204
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.226* (1.84)	-0.321* (-1.88)	0.934*** (5.15)
Observations:	392	202	190
MVR coefficient (robust regression)	0.262** (2.18)	-0.298* (-1.85)	1.061*** (6.09)
Observations:	391	201	190
MVR coefficient with control functions (robust SE)	0.219* (1.77)	-0.320* (-1.87)	0.855*** (4.66)
Observations:	392	202	190

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Households with no reported income from sales of coffee are assumed to have an income of 1 Haitian gourde, in order to enable calculation of the natural logarithm.

7.3.2 Diversification of household income

A major emphasis of the current Oxfam GB project is on diversification of income sources for coffee farmers, and some of RECOCARNO's activities have been focused specifically on diversifying agricultural production. Table 7.7 shows the number of crops other than coffee produced and sold by members of the household in the 12 months prior to the survey. Again, there is a large divergence in outcomes between the two project areas. It is clear that, in Dondon, members of RECOCARNO cooperatives are bringing a wider range of crops to market than members of the comparison cooperative. Interestingly, there is no difference between the numbers of crops grown by members of RECOCARNO cooperatives and those of the comparison cooperatives, even in Dondon. (Full results are not shown here, but households in Dondon produced an average of around 15 crop types other than coffee.) The results of Table 7.7 indicate that members of the RECOCARNO cooperatives are either producing some of these alternative crops at a greater scale or are more successful in bringing them to market.

In the North East, the situation on crop diversity is less clear. However, on average, there may be a slight negative impact: members of RECOCARNO cooperatives are selling fewer types of crop than members of the comparison cooperatives. It is likely that the relatively higher prices available for coffee (identified in Table 7.3 above) has lead members to concentrate their resources on producing coffee rather than other crops. This applies to both

the cultivation and the sale of crops. (Again, results for numbers of crops produced are not shown here.)

Table 7.7: Number of crops other than coffee produced and sold by the household in the 12 months preceding the survey

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	8.32	8.43	8.23
Intervention mean	7.971	9.242	6.689
Comparison mean	8.657	7.617	9.590
Unadjusted difference	-0.687 (-1.51)	1.625*** (2.61)	-2.900*** (-4.60)
Observations:	493	240	253
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.390 (0.75)	1.601*** (2.77)	-0.831 (-0.99)
Observations:	486	237	249
Post-matching difference (no replacement)	0.030 (0.06)	1.357** (2.22)	-1.561** (-2.08)
Observations:	450	235	215
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.306 (0.67)	1.504*** (2.64)	-1.580* (-1.92)
Observations:	443	214	229
MVR coefficient (robust regression)	0.278 (0.58)	1.399** (2.31)	-1.677* (-1.95)
Observations:	443	214	229
MVR coefficient with control functions (robust SE)	0.324 (0.70)	1.489** (2.59)	-1.668** (-2.01)
Observations:	443	214	229

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

In Dondon, members of the RECOCARNO cooperatives sell a greater variety of crops than members of the comparison cooperative. The opposite is the case in the North East.

Given these findings, we would expect that members of RECOCARNO cooperatives in Dondon also appear to be generating more income from crops other than coffee than members of the comparison cooperative. Table 7.8 shows the estimates of this difference support this view – though the difference is small and not statistically significant. Again in the North East, the evidence we have is that the difference is negative.

Table 7.8: Household income from sales of crops other than coffee in the 12 months preceding the survey (natural logarithm of Haitian gourdes)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	8.357	8.403	8.314
Intervention mean	8.227	8.476	7.976
Comparison mean	8.479	8.330	8.613
Unadjusted difference	-0.252 (-1.30)	0.145 (0.55)	-0.637** (-2.24)
Observations:	493	240	253
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	-0.225 (-0.96)	0.166 (0.58)	-0.646* (-1.72)
Observations:	471	237	234
Post-matching difference (no replacement)	-0.095 (-0.45)	0.125 (0.44)	-0.373 (-1.07)
Observations:	446	237	209
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.131 (0.59)	0.273 (0.98)	-0.293 (-0.70)
Observations:	443	214	229
MVR coefficient (robust regression)	0.220** (2.20)	0.174 (1.14)	0.163 (1.03)
Observations:	443	214	229
MVR coefficient with control functions (robust SE)	0.141 (0.61)	0.267 (0.96)	-0.376 (-0.85)
Observations:	443	214	229

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Households with no reported income from crops other than coffee are assumed to have an income of 1 Haitian gourde, in order to enable calculation of the natural logarithm.

There are no significant differences in the revenue generated from the sale of crops other than coffee.

Since we have found that members of the RECOCARNO cooperatives in Dondon are generating less income from coffee but more income from other crops than the comparison cooperatives – and vice versa in the North East – it is interesting to consider the overall level of household income from sale of crops, including coffee. This results are presented in Table 7.9. There is some evidence of an overall positive impact in the North East (though the evidence is not strong), but not in Dondon. Again, these figures reflect only revenue from sales, and do not account for varying costs of production or consumption of produce within the household.

Table 7.9: Total household income from sale of coffee and other crops, in the 12 months preceding the survey (natural logarithm of Haitian gourdes)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	9.125	9.311	8.943
Intervention mean	9.171	9.322	9.017
Comparison mean	9.080	9.299	8.874
Unadjusted difference	0.090 (0.75)	0.023 (0.14)	0.143 (0.85)
Observations:	481	238	243
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.452 (1.50)	0.019 (0.11)	0.940 (1.54)
Observations:	455	235	220
Post-matching difference (no replacement)	0.135 (0.94)	0.004 (0.02)	0.367 (1.49)
Observations:	422	235	187
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.262* (1.83)	-0.016 (-0.08)	0.576** (2.27)
Observations:	429	210	219
MVR coefficient (robust regression)	0.201** (2.23)	0.101 (0.83)	0.255 (1.63)
Observations:	429	210	219
MVR coefficient with control functions (robust SE)	0.267* (1.80)	-0.022 (-0.11)	0.532** (2.03)
Observations:	429	210	219

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Overall, there appears to be little or no impact on total agricultural revenue from membership of a RECOCARNO cooperative.

Other than through support to the production of alternative crops, another method through which RECOCARNO seeks to promote income diversification is through encouraging producer households to set up household businesses. As noted in Section 7.2, a greater proportion of the members of RECOCARNO cooperatives reported that their cooperative had assisted them with access to credit for non-agricultural activities than among the members of comparison cooperatives. The survey asked respondents to report which members of their households are engaged in household businesses or other income-generating activities: as shown in Table 7.10, more than a third of productive adults in respondents' households are involved in some sort of household business. However, there is no indication that this proportion is higher in RECOCARNO cooperatives than in their comparison cooperatives.

Table 7.10: Proportion of productive adult household members who are involved in a non-agricultural household businesses

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.361	0.391	0.332
Intervention mean	0.362	0.414	0.308
Comparison mean	0.360	0.368	0.353
Unadjusted difference	0.002	0.046	-0.046
	(0.05)	(1.12)	(-1.05)
Observations:	484	235	249
<i>PSM (ATT)</i>			
Post-matching difference	0.054	0.063	0.046
(kernel)	(1.61)	(1.54)	(0.86)
Observations:	481	235	246
Post-matching difference (no replacement)	0.029	0.061	-0.019
	(0.90)	(1.40)	(-0.34)
Observations:	440	228	212
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	-0.006	0.036	-0.013
	(-0.17)	(0.81)	(-0.23)
Observations:	436	210	226
MVR coefficient (robust regression)	-0.028	0.040	-0.065
	(-0.89)	(0.86)	(-1.36)
Observations:	436	210	226
MVR coefficient with control functions (robust SE)	-0.004	0.034	-0.008
	(-0.11)	(0.76)	(-0.13)
Observations:	436	210	226

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

There is no evidence that RECOCARNO was successful in its efforts to encourage its members to engage in off-farm businesses.

There is also no difference between the RECOCARNO cooperatives and comparison cooperatives in the proportion of household income coming from these household businesses, with these businesses represented an average of around 13 per cent of household income in both Dondon and the North East department . (Full figures are not shown here.)

Another indication of the degree of diversification in the household's economic activities may be the proportion of household income which is derived from coffee. Table 7.11 shows that respondents estimated that in the 12 months prior to the survey, around 70 per cent of their income came from sources other than the sale of coffee. Contrary to the aim of encouraging diversification, this proportion is lower in the RECOCARNO cooperatives than in the comparison cooperatives. However, that difference comes solely from the North East department; there is no significant difference in Dondon. It should also be recalled from Section 7.3.2 that producers in RECOCARNO cooperatives in the North East realise much higher prices for their coffee than those in the comparison cooperatives. It does appear from Table 7.11 that members of the RECOCARNO cooperatives are responding to these price incentives, as is natural, by investing more in coffee than they otherwise would.

Table 7.11: Proportion of total household revenue from sources other than sale of coffee, in the 12 months prior to the survey

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.703	0.664	0.739
Intervention mean	0.682	0.669	0.695
Comparison mean	0.722	0.660	0.778
Unadjusted difference	-0.040** (-2.55)	0.009 (0.44)	-0.084*** (-3.83)
Observations:	493	240	253
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	-0.017 (-1.24)	-0.005 (-0.26)	-0.031 (-1.39)
Observations:	476	235	241
Post-matching difference (no replacement)	-0.051*** (-3.28)	0.001 (0.03)	-0.045* (-1.73)
Observations:	469	232	237
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	-0.027** (-2.14)	-0.005 (-0.29)	-0.040* (-1.85)
Observations:	443	214	229
MVR coefficient (robust regression)	-0.012 (-1.16)	0.013 (0.91)	-0.039** (-2.38)
Observations:	443	214	229
MVR coefficient with control functions (robust SE)	-0.026** (-2.07)	-0.005 (-0.32)	-0.038* (-1.74)
Observations:	443	214	229

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Coffee accounts for a higher proportion of the income of members of the RECOCARNO cooperatives in the North East than of members of the comparison cooperatives.

7.3.3 Household income and consumption

If RECOCARNO's activities in supporting the production of coffee and collective marketing have been successful, then members of RECOCARNO cooperatives should be experiencing greater net income from coffee. These net benefits will have been sustained during the several years of RECOCARNO's membership – and in fact were presumably higher during previous years, since (as described in Section 7.2) the Fairtrade premium was greater for most of the period between 2004 and 2008 than in subsequent years. We should therefore expect to see indicators of higher current income among members of RECOCARNO cooperatives, as well as indications that income has been sustained over the long term, compared to members of cooperatives which have not benefited from RECOCARNO support.

Various measures were collected in the survey which can be used to evaluate household consumption, wealth and poverty. The simplest measure involved asking respondents about whether their household income had increased, decreased or stayed roughly the same since the year 2004. Table 7.12 shows that, while a higher proportion of respondents in the RECOCARNO cooperatives reported that their household income had increased since 2004 than in the comparison cooperatives, this is rendered statistically insignificant after controlling for measured differences between the two groups.

Table 7.12: Proportion of respondents reporting that their overall household income had increased since 2004

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.193	0.238	0.151
Intervention mean	0.231	0.259	0.203
Comparison mean	0.158	0.218	0.104
Unadjusted difference	0.073** (2.03)	0.040 (0.72)	0.099** (2.20)
Observations:	487	235	252
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.034 (0.74)	0.030 (0.50)	0.038 (0.54)
Observations:	480	233	247
Post-matching difference (no replacement)	0.051 (1.36)	0.045 (0.78)	0.034 (0.62)
Observations:	449	229	220
<i>Multivariable Regression:</i>			
Probit (fixed effects; robust standard errors)	0.243 (1.52)	0.189 (0.92)	0.326 (1.07)
Observations:	439	211	228
Probit with control functions (robust SE)	0.252 (1.58)	0.182 (0.88)	0.344 (1.13)
Observations:	439	211	228

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

In the North East, respondents were more likely to report being able to meet their basic needs.

Table 7.13: Proportion of respondents reporting that their household is able to meet its basic needs from household income

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.335	0.436	0.242
Intervention mean	0.397	0.466	0.331
Comparison mean	0.278	0.407	0.164
Unadjusted difference	0.120*** (2.81)	0.059 (0.90)	0.166*** (3.12)
Observations:	486	234	252
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.090** (2.00)	0.066 (1.01)	0.115* (1.83)
Observations:	464	231	233
Post-matching difference (no replacement)	0.090** (2.00)	0.062 (0.96)	0.124* (1.92)
Observations:	454	231	223
<i>Multivariable Regression:</i>			
Probit (fixed effects; robust standard errors)	0.467*** (3.34)	0.321* (1.68)	0.748*** (3.17)
Observations:	438	210	228
Probit with control functions (robust SE)	0.460*** (3.33)	0.326* (1.72)	0.688*** (2.92)
Observations:	438	210	228

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

The survey also asked respondents about the ability of their household to meet its basic needs from current income, without relying on savings, selling assets, or external support. Thirty-four per cent of respondents responded

positively to this question overall. However, there was a large difference between Dondon (44 per cent positive) and the North East (24 per cent positive). As shown in Table 7.13, members of RECOCARNO cooperatives were more likely to respond positively to this question than members of comparison cooperatives, particularly in the North East.

A more convincing indicator, however, is to examine the effect on household consumption directly. As described in Section 5.1, the survey asked all respondents to estimate the value of all the food items which members of their household have eaten in the past seven days, as well as all the other expenditures which members of the household had made recently. These expenditure details were aggregated and converted into a per-person per-day figure. The results are shown in Table 7.14.

It is clear from Table 7.14 that members of RECOCARNO cooperatives in the North East have higher levels of consumption than members of the comparison cooperatives. This is a strong result is corroborated with high significance in each of the statistical tests. Specifically, estimates of an increase in consumption range between 30 per cent and 50 per cent. We have already seen (in Table 7.6) that, in the North East, the revenue from coffee among members of RECOCARNO cooperatives is considerably higher than among those of the comparison cooperatives. The results in Table 7.14 suggest that this higher income from coffee does translate into benefits for the household, rather than being consumed in higher costs of production.

In the North East, total household consumption is significantly higher than members of the comparison cooperatives – but this is not the case in Dondon.

On the other hand, in Dondon, household consumption appears to be slightly lower among members of the RECOCARNO cooperative than among members of the comparison cooperative. This result is smaller and less certain than the positive result in the North East, but it does show as significant in several of the statistical tests. It should be recalled from Table 7.6 that revenue from coffee is approximately the same among members of RECOCARNO cooperatives in Dondon as among members of the comparison cooperatives, but that it had been suggested that producing organic coffee (as demanded by the comparison cooperative in Dondon) may involve higher costs of production, which would have the effect of reducing net household income from coffee. Table 7.14 implies that this is not the case, and instead that net income from coffee is the same or higher among members of the comparison cooperative than members of the RECOCARNO cooperatives.

Overall, then, there is evidence of a slight positive effect from membership of a RECOCARNO cooperative on household consumption. This overall effect, though, aggregates a large positive effect in the North East with a marginally negative effect in Dondon.

In Table 7.15, the same results for overall household consumption are shown in terms of the Oxfam GB global indicator: the proportion of households with consumption greater than the mean of the comparison group. Again, there is a clear positive result in the North East and a marginally significant negative effect in Dondon.

**Table 7.14: Value of household consumption
(natural logarithm of gourdes per person per day)**

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	4.629	4.686	4.575
Intervention mean	4.700	4.605	4.795
Comparison mean	4.562	4.765	4.379
Unadjusted difference	0.139** (2.50)	-0.161* (-1.93)	0.416*** (6.07)
Observations:	491	238	253
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.108* (1.65)	-0.113 (-1.41)	0.375*** (3.70)
Observations:	457	237	220
Post-matching difference (no replacement)	0.098 (1.61)	-0.157* (-1.80)	0.399*** (4.35)
Observations:	440	237	203
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.106** (1.98)	-0.148** (-1.99)	0.416*** (5.34)
Observations:	443	214	229
MVR coefficient (robust regression)	0.106** (1.98)	-0.171** (-2.17)	0.401*** (5.07)
Observations:	443	214	229
MVR coefficient with control functions (robust SE)	0.099* (1.83)	-0.145* (-1.95)	0.390*** (5.02)
Observations:	443	214	229

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

**Table 7.15: Proportion of households with per capita per day
consumption greater than the median of the comparison group**

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.556	0.445	0.660
Intervention mean	0.616	0.390	0.840
Comparison mean	0.500	0.500	0.500
Unadjusted difference	0.116*** (2.60)	-0.110* (-1.71)	0.340*** (6.09)
Observations:	491	238	253
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.076 (1.61)	-0.089 (-1.38)	0.267*** (3.97)
Observations:	461	237	224
Post-matching difference (no replacement)	0.077 (1.56)	-0.111* (-1.65)	0.344*** (5.14)
Observations:	450	237	213
<i>Multivariable Regression:</i>			
Probit (fixed effects; robust standard errors)	0.268* (1.95)	-0.356* (-1.88)	1.331*** (4.98)
Observations:	443	214	229
Probit with control functions (robust SE)	0.231* (1.70)	-0.349* (-1.84)	1.240*** (4.72)
Observations:	443	214	229

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

The global outcome indicator for livelihoods is strongly positive in the North East and slightly negative in Dondon.

7.3.4 Food security

Disaggregation of the figures in Table 7.14 into types of consumption (not shown here) confirm that not only overall expenditure but also food expenditure specifically are higher among members of RECOCARNO cooperatives in the North East than among comparison cooperatives. Table 7.16 tests whether this extra expenditure translates into increased household food security. Note that in this table, higher figures represent *lower* food security. The results are not statistically significant, but the estimates are that members of RECOCARNO cooperatives have better food security than the comparison cooperatives in the North East, but worse food security in Dondon. This is consistent with the results on household consumption found above.

Table 7.16: Food security score (first principle component – higher numbers represent lower food security)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.000	0.000	0.000
Intervention mean	0.091	0.224	-0.035
Comparison mean	-0.086	-0.222	0.031
Unadjusted difference	0.177 (1.16)	0.447** (2.07)	-0.067 (-0.31)
Observations:	449	213	236
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.117 (0.73)	0.317 (1.41)	-0.115 (-0.49)
Observations:	422	213	209
Post-matching difference (no replacement)	0.067 (0.41)	0.364 (1.60)	-0.136 (-0.57)
Observations:	417	209	208
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.092 (0.59)	0.284 (1.28)	-0.210 (-0.88)
Observations:	403	190	213
MVR coefficient (robust regression)	0.049 (0.30)	0.136 (0.60)	-0.250 (-0.96)
Observations:	403	190	213
MVR coefficient with control functions (robust SE)	0.102 (0.66)	0.274 (1.27)	-0.220 (-0.91)
Observations:	403	190	213

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Data collected on indicators of food security are inconclusive in both geographic areas.

7.3.5 Asset wealth

One weakness with using current household consumption as a measure of success of the support provided to members of RECOCARNO cooperatives is that it is likely to be highly dependent on recent income levels. As noted in Section 7.2, the premium due from sales of Fairtrade coffee above international market prices was only small during 2010 and 2011, but has been much larger during most of the rest of RECOCARNO's lifetime, when the Fairtrade floor price has applied. This suggests that income for members of RECOCARNO cooperatives is likely to have been higher than members of comparison cooperatives in earlier years, but this is unlikely to be demonstrated to any great extent in current consumption.

A measure which is more likely to indicate past income differentials is the assets owned by households. As described in Section 5.2, the survey asked about ownership of a series of assets and other wealth indicators – both in 2004 and on the date of the survey – and these observations were used to create an index of the change in ownership of each asset. The effects on the resulting index of changes in asset ownership are shown in Table 7.17. In this table, positive numbers represent an increase in assets and other wealth indicators compared to the rest of the sample; negative numbers represent a decrease relative to the rest of the sample.

Table 7.17: Change in asset index between 2004 and date of survey

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.003	0.000	0.006
Intervention mean	0.134	0.023	0.237
Comparison mean	-0.116	-0.020	-0.211
Unadjusted difference	0.251	0.044	0.448*
	(1.31)	(0.15)	(1.75)
Observations:	442	216	226
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.226	0.113	0.330
	(1.21)	(0.43)	(1.23)
Observations:	442	216	226
Post-matching difference (no replacement)	0.172	0.093	0.246
	(0.89)	(0.32)	(0.97)
Observations:	422	207	215
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.193	0.040	0.365
	(0.89)	(0.13)	(1.17)
Observations:	428	212	216
MVR coefficient (robust regression)	0.032	-0.003	0.076
	(0.36)	(-0.02)	(0.64)
Observations:	428	212	216
MVR coefficient with control functions (robust SE)	0.187	0.028	0.394
	(0.86)	(0.09)	(1.26)
Observations:	428	212	216

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

There is little evidence of asset accumulation among members of RECOCARNO cooperatives in either area.

The results in Table 7.17 do not provide good evidence that members of RECOCARNO cooperatives have had a greater increase in their asset wealth since 2004 than members of the comparison cooperatives. Estimates of the impact in both areas are generally positive, but not statistically significant. There is, then, little impact of long-term improvements in wealth deriving from membership of a RECOCARNO cooperative, even in the North East.

7.3.5 Education spending

If members of the RECOCARNO cooperatives are generating more income than members of the comparison cooperatives (at least in the North East department) but this is not translating into significant improvements in food security or asset wealth, the question remains of what this additional income is used for. One possibility may be non-material investment: the most obvious example of this is in children's education. Data on expenditure on education was collected in the survey: Table 7.18 analyses the expenditure per child for those households with school-age members. (School age is defined

heuristically for this purpose as being aged between 4 and 20 years inclusive). In the North East members of RECOCARNO cooperatives do appear to be spending more on education per child compared to members of the comparison cooperatives, but no such difference can be observed in Dondon.

Table 7.18: Expenditure on education, per child aged between 4 and 20 years inclusive (natural logarithm of Haitian gourdes per month)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	7.453	7.663	7.326
Intervention mean	7.645	7.683	7.621
Comparison mean	7.259	7.642	7.030
Unadjusted difference	0.386**	0.041	0.591***
	(2.38)	(0.15)	(3.03)
Observations:	183	69	114
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.299	0.030	0.500*
	(1.44)	(0.11)	(1.70)
Observations:	174	69	105
Post-matching difference (no replacement)	0.387**	0.011	0.710***
	(2.10)	(0.04)	(2.67)
Observations:	157	69	88
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.133	-0.082	0.277
	(0.74)	(-0.25)	(1.20)
Observations:	162	60	102
MVR coefficient (robust regression)	0.153	0.057	0.243
	(0.84)	(0.16)	(0.95)
Observations:	162	60	102
MVR coefficient with control functions (robust SE)	0.147	-0.109	0.258
	(0.83)	(-0.32)	(1.08)
Observations:	162	60	102

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Education spending per child is higher among members of the RECOCARNO cooperatives than among members of the comparison cooperatives.

The proportion of children reported to be attending school was also higher among members of RECOCARNO cooperatives than the comparison cooperatives in both areas, but again this relationship is not statistically significant, so cannot be stated with confidence. The breakdown of figures are not shown here, but overall, 89 per cent of children between the ages of 4 and 20 were reported to be attending school in the current academic year.

7.3.6 Gender balance in household expenditure

For items of household expenditure which can be identified as benefiting a specific individual (including expenditure on health, education, transport, and leisure activities), respondents were asked to specify the amounts which were spent separately on males and on female within the household. The logarithm of the ratios is shown in Table 7.19: the fact that all of the estimates are positive shows that on average more was spent on males than females in these households. There is, however, no detectable difference in the ratio between members of RECOCARNO cooperatives and members of comparison cooperatives.

Table 7.19: Ratio of household expenditure on goods and services for males to females (natural logarithm)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.174	0.234	0.120
Intervention mean	0.229	0.254	0.205
Comparison mean	0.124	0.214	0.047
Unadjusted difference	0.105 (1.14)	0.039 (0.31)	0.158 (1.20)
Observations:	449	213	236
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.032 (0.28)	0.016 (0.12)	0.050 (0.23)
Observations:	431	213	218
Post-matching difference (no replacement)	0.102 (0.98)	0.025 (0.19)	0.197 (1.26)
Observations:	409	206	203
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.152 (1.44)	0.069 (0.51)	0.273 (1.42)
Observations:	405	193	212
MVR coefficient (robust regression)	0.080 (0.93)	0.038 (0.27)	0.203* (1.75)
Observations:	405	193	212
MVR coefficient with control functions (robust SE)	0.147 (1.38)	0.087 (0.67)	0.253 (1.28)
Observations:	405	193	212

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions.

Coefficients for covariates used are not presented.

Household expenditure is biased towards males, with no significant differences between the RECOCARNO and comparison cooperatives.

7.3.7 Attitudes to gender roles

As described in Section 5.2, all respondents were asked to state their level of agreement or disagreement with a series of 15 statements on the economic roles of women, and an overall score was constructed using factor analysis. The results are shown in Tables 7.20 and 7.21, for male and female respondents respectively. Here, higher scores represent more positive attitudes to women's roles.

There is some evidence for positive impact on the attitudes of male respondents. However, the magnitude of this impact is much greater in Dondon⁹ than in the North East (where the effect is not statistically significant). There is no clear difference in the attitudes of female respondents. It is important to note, of course, that women respondents (who are all independent members of the cooperative) had generally much more positive attitudes to women's economic roles than did the male respondents, so there was less potential to find impact on the attitudes of women.

⁹ The lack of statistical significance on the coefficient of the MVR model with control functions for Dondon could suggest the existence of some hidden bias which was over-stating the significance of the effects in the other models. To test this further, robust regression was used with control functions, which resulted in an effect size of 0.339 which is significant with $p < 0.05$. We conclude from this that the judgment that there is evidence of a statistically significant effect is justified.

Table 7.20: Attitudes to gender roles among male respondents (factor analysis)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.000	-0.001	0.001
Intervention mean	0.136	0.215	0.033
Comparison mean	-0.118	-0.100	-0.130
Unadjusted difference	0.254** (2.51)	0.315** (2.10)	0.163 (1.16)
Observations:	239	115	124
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	0.201* (1.79)	0.303** (2.06)	0.037 (0.24)
Observations:	228	115	113
Post-matching difference (no replacement)	0.245** (2.07)	0.399*** (2.77)	0.020 (0.11)
Observations:	217	111	106
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	0.188* (1.72)	0.267* (1.69)	0.135 (0.83)
Observations:	216	101	115
MVR coefficient (robust regression)	0.210* (1.83)	0.380** (2.40)	0.146 (0.79)
Observations:	216	101	115
MVR coefficient with control functions (robust SE)	0.175 (1.55)	0.202 (1.31)	0.091 (0.57)
Observations:	216	101	115

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions. Coefficients for covariates used are not presented.

Male members of RECOCARNO cooperatives expressed better attitudes towards the economic roles of women than do male members of the comparison cooperatives – particularly in Dondon.

Table 7.21: Attitudes to gender roles among female respondents (factor analysis)

	Overall	Dondon	North East
<i>Unadjusted:</i>			
Sample mean	0.000	0.072	-0.067
Intervention mean	0.015	0.033	-0.002
Comparison mean	-0.013	-0.030	0.005
Unadjusted difference	0.028 (0.21)	0.063 (0.35)	-0.007 (-0.04)
Observations:	169	84	85
<i>PSM (ATT)</i>			
Post-matching difference (kernel)	-0.006 (-0.03)	0.100 (0.44)	-0.117 (-0.47)
Observations:	167	84	83
Post-matching difference (no replacement)	-0.065 (-0.41)	0.086 (0.40)	-0.157 (-0.63)
Observations:	150	80	70
<i>Multivariable Regression:</i>			
MVR coefficient (fixed effects; robust standard errors)	-0.042 (-0.30)	0.158 (0.81)	-0.316 (-1.13)
Observations:	154	77	77
MVR coefficient (robust regression)	-0.011 (-0.08)	0.175 (0.78)	-0.253 (-0.88)
Observations:	154	77	77
MVR coefficient with control functions (robust SE)	-0.052 (-0.36)	0.158 (0.80)	-0.521* (-1.84)
Observations:	154	77	77

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

PSM estimates bootstrapped 1000 repetitions. Coefficients for covariates used are not presented.

8 Conclusion and Programme Learning Considerations

8.1 Conclusions

Overall, the effectiveness review found strong evidence that the support provided by Oxfam GB and RECOCARNO to cooperatives resulted in improved coffee production and increased income for members, but only in the North East department. There is no evidence of impact on the overall household income of producers in Dondon.

Even in the North East department, where overall household income is certainly higher, it is not clear how this additional income is being put to use. There is little evidence that higher food consumption has translated into improved food security. Evidence that there has been any asset accumulation is also very weak. Given that the price for the purchase of Fairtrade coffee has been considerably higher than the market price for most of the period of RECOCARNO's existence, it is surprising that there is little sign of long-term sustained higher income. On the other hand, there is some evidence of increased investment in children's education among households of RECOCARNO members in the North East.

The finding of greatest concern is why increased household income in the North East appears not to have lead to observable long-term improvements in household wellbeing.

A possible explanation for the apparent lack of asset accumulation may be in the growth which RECOCARNO has experienced over the course of its existence. RECOCARNO reports that total membership of its network increased from 3,750 in 2003 to more than 6,500 as of early 2012. While there are important non-financial benefits to be gained from membership of a RECOCARNO cooperative, it seems reasonable to assume that the main driver of increased membership has been the premium paid by RECOCARNO for members' coffee production. At the same time, RECOCARNO's contracts with Fairtrade purchasers presumably limit the amount of Fairtrade coffee it can sell. It seems likely that, during the years of high Fairtrade premium, growth in supply from cooperatives may have outpaced RECOCARNO's ability to market coffee at Fairtrade prices. If so, then presumably this meant restricting the amount which each cooperative can buy from each of its members or purchasing the excess coffee but selling it on at non-Fairtrade prices. If this is the case, even though the premium from Fairtrade sales may have been high, the surplus was being divided between more and more cooperative members. This is the situation described in at least one empirical study of returns to Fairtrade coffee producers in Central America.¹⁰ This hypothesis can be tested by examining the history of prices paid by RECOCARNO to producers, along with information on whether it has been necessary for RECOCARNO to restrict supply, and if so how this has been achieved.

Another possible explanation for the lack of evidence of accumulated wealth is that producers have found it costly meeting RECOCARNO's quality standards. It is clear from the difference in per-unit price paid for coffee in the North East that there is a difference in the quality of coffee being produced by the members of the RECOCARNO cooperatives in comparison with members of the comparison cooperatives. This price difference cannot be explained by the Fairtrade premium alone. It is quite possible that members of

¹⁰ Alain de Janvry, Craig McIntosh and Elisabeth Sadoulet, "Fair Trade and Free Entry: The Dissipation of Benefits in a Disequilibrium Market", April 2011, <http://www.basis.wisc.edu/documents/FairTrade%20April2011.pdf>; summary briefing note: <http://www.basis.wisc.edu/live/amabrief10-08.pdf>.

RECOCARNO cooperatives have been receiving a significant premium over several years, but also experiencing higher costs of production. In this case, the higher consumption observed in the North East at the time of the survey may suggest that net benefits *are* now being realised by members of RECOCARNO cooperatives. Perhaps the training and technical support provided to producers in the past 2-3 years has been successful in increasing their productivity. If so, this is an optimistic conclusion for producers in the North East: it suggests that higher returns may be sustained in the future. However, given that most respondents have been members of their respective cooperatives for several years or more, and that the quality standards have not changed in the recent past, this conclusion seems unlikely.

There may be tension between the objectives of promoting diversification while also giving farmers a price incentive to invest in coffee production.

In terms of impact on diversification, we find some evidence that the project activities have been successful in Dondon, where members of RECOCARNO cooperatives are bringing a wider variety of crops to market and generating more income than members of the comparison cooperative. However, we do not find any such effect in the North East. There may be some tension between the activities aimed at encouraging diversification from the effects of the Fairtrade coffee price. In particular, it is natural that those producers who receive higher returns from the cultivation of coffee would invest proportionately more in coffee and less in other crops. The fact that members of RECOCARNO cooperatives in Dondon appear to have diversified their crop sales more than those in the North East does not necessarily reflect a failure of the diversification activities in the North East. Instead, it may be that those in the North East have been equipped to diversify their crop portfolio as well as those in Dondon, but they have not in fact done so because the price signal to concentrate on coffee is so much stronger.

Finally, while effects of RECOCARNO membership on gender outcomes was not an emphasis of this effectiveness review, it does appear that there is some benefit from Oxfam's and RECOCARNO's work on the attitudes of male beneficiaries to women's economic roles. This size of this impact, however, varies widely between Dondon (where it is large) and the North East, where it is small and not statistically significant.

8.2 Programme Learning Considerations

- **Further investigate the reasons for lack of clear long-term impact in the North East, in spite of the apparent benefit from RECOCARNO membership.**

This effectiveness review has revealed some important conclusions about the effect of this long-term programme in support of coffee producers. However, some important questions remain. Most importantly, why does the longstanding premium to Fairtrade production appear not to have resulted in sustained increases in the wealth of producers? As a first step, it will be important to understand how growth in membership of the RECOCARNO network has affected the coffee price being received by existing members. If increases in membership have dissipated the Fairtrade premium by splitting it between ever larger numbers of cooperative members, then RECOCARNO may wish to consider how to balance growth and capacity in the future. This may require restricting increases in membership to match increases in its ability to market coffee at Fairtrade prices. For example, it may call for RECOCARNO to reconsider its strategy of expanding its network to four

additional cooperatives in the near future. However, if the price premium which producers have been receiving has been sustained over several years, further research should be undertaken with these producers, to understand why this extra income has resulted in few significant improvements in wealth indicators.

- **Review what can be learned from the comparison cooperative in Dondon in terms of bringing benefits to members.**

As described in Section 4.3, COOPAVCOD, the cooperative selected as a comparator for the RECOCARNO cooperatives in Dondon is one which did not join RECOCARNO at its inception in 2001, and has consequently received little external support. This comparison cooperative has specialised in the supply of organic coffee, which – although clearly commanding higher prices – is also said to involve higher costs of production, particularly at the certification stage. In spite of this, COOPAVCOD members appear to have benefited just as much from their participation in that cooperative as have members of the two RECOCARNO cooperatives in Dondon. Although total agricultural revenue appears to be approximately the same for members of the RECOCARNO cooperatives as for comparable members of COOPAVCOD, recent net household income may even be slightly higher among COOPAVCOD members.

It is not clear from the results of this review by what route the apparent benefit to membership of COOPAVCOD is being achieved. We suggest that Oxfam and RECOCARNO seek to understand whether anything can be learned from COOPAVCOD's approach. If the benefit which COOPAVCOD brings to its members arises primarily from the organic certification, this may be a market opportunity which RECOCARNO should seek to pursue.

- **Consider how best to promote diversification of income sources while simultaneously providing price incentives for investing in the production of coffee.**

The results of this effectiveness review suggest that attempts to encourage diversification among coffee producers were not effective in the North East, where RECOCARNO membership brings a clear incentive to invest in coffee. It is conceivable that this project has been successful in equipping producers in the North East to further diversify their crop portfolio (as seems to have happened to a modest degree in Dondon), but that they have chosen not to do so because they are currently benefiting from a greater emphasis on coffee production. However, it is still possible that these producers are excessively vulnerable to poor coffee harvests. The programme team and RECOCARNO should carefully investigate how coffee producers in the North East are making decisions on the mix of crops they are producing, whether they have taken full account of the project's messages about diversification, and whether these messages should be reinforced in the future.

- **Understand why improvements in attitudes towards women's economic roles have been much greater in Dondon than in the North East.**

The improvement in attitudes towards women's economic roles is clear and reasonably large in magnitude in Dondon. However, there has been only a small non-significant effect among members of RECOCARNO cooperatives in the North East. The programme team should seek to understand how

RECOCARNO's implementation has varied in the two areas, what the successful mechanisms of change have been in Dondon, and whether these lessons can be applied in the North East and elsewhere.