



# Promoting Sustainable Livelihoods for Women & Vulnerable Groups in Chiradzulu District Project Effectiveness Review

## *Full Technical Report*



**Oxfam GB**  
**Women's Empowerment Outcome Indicator**

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## **Executive summary**

Under Oxfam Great Britain's (OGB) Global Performance Framework, a number of projects are randomly selected each year for a rigorous assessment of their effectiveness. The 'Promoting Sustainable Livelihoods for Women & Vulnerable Groups' project carried out in Chiradzulu District in Malawi was one of those selected for review in the 2012/13 financial year. This project was implemented between 2009 and 2013 in collaboration with the Centre for Alternatives for Victimised Women and Children (CAVWOC), and aimed at empowering vulnerable people – especially women – through engagement in production and facilitating access to markets.

The project's main activities involved facilitating the creation and capacity-building of approximately 180 village savings and loans (VSL) groups in 81 villages. A number of households in the same areas have also been supported in horticulture production, while others formed groups and received support in the breeding of pigs. In addition, the partners have worked to raise awareness and reduce the acceptability of gender-based violence in the project areas.

The Effectiveness Review adopted a quasi-experimental impact evaluation design, comparing a members of a randomly-selected sample of VSL groups with a sample of women in nearby communities where the project had not been implemented. The survey questions allowed the project's impact on various dimensions of women's empowerment to be evaluated, as well as outcomes relating to households' access to and use of credit, agricultural production, and indicators of material wellbeing. At the analysis stage, the statistical tools of propensity-score matching (PSM) and multivariable regression were used to reduce bias in making comparisons between the supported and comparison households.

The results provide clear evidence that the establishment of the VSL groups has led to members making regular savings, and has had a positive impact on the availability of credit in these communities. Many of the loans were reported to have been used for productive purposes – and indeed the survey data show increased engagement among VSL members in petty commerce, as well as an increase in the amount of fertiliser being used. Those supported in horticulture production, as well as the VSL members more generally, produced a wider range of crops than households in the comparison communities, and generated revenue from agricultural production that was several times higher than they would have done otherwise. It appears that this has not translated into major improvements in household wellbeing (or at least, not yet), but there are indications of a small improvement in indicators of food security and dietary diversity.

In terms of women's empowerment, project participants demonstrated greater empowerment than comparison respondents mainly in those characteristics directly connected to the project activities: savings, access to credit, and participation in community groups. However, it also appears that women who have participated in the project activities are more likely to play the main role in household cash management, and perhaps also display more positive attitudes towards women's economic and domestic roles. Strangely, project participants were more likely than comparison respondents to say that marital violence could be justified in some circumstances – though this perhaps reflects greater confidence on the part of these women in voicing their opinions on this sensitive subject. No specific differences could be identified in these results among those who participated specifically in the horticulture or piggery components of the project.

In order to take forward learning from this project, Oxfam in general, and the Malawi programme team and partners in particular, are encouraged to consider the following points:

- Seek to understand further the reasons that participation in the VSL groups, as well as the horticulture and piggery activities, have not resulted in significant effects on food security or wealth indicators – and how this relates to women's position in household decision-making.

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- Carefully monitor the potential for women's economic empowerment activities to increase the incidence of violence against women.

## 1 Introduction and purpose

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

*This report documents the findings of a **P**roject **E**ffectiveness **R**eview, focusing on outcomes related to women's empowerment.*

The global outcome indicator for the women's empowerment thematic area is the extent to which targeted women demonstrate greater empowerment, against the median (or 'typical') observation in the comparison area. The household survey carried out in Chiradzulu District in Malawi in April 2013 was part of an effort to assess the impact that the work of Oxfam and its partners has had on this indicator.

One of the projects selected for an Effectiveness Review in the 2012/13 financial year was the 'Promoting Sustainable Livelihoods for Women & Vulnerable Groups' project in Chiradzulu District in the Southern Region of Malawi. This project was implemented between 2009 and 2013 in collaboration with the Centre for Alternatives for Victimised Women and Children (CAVWOC), and aimed at empowering vulnerable people – especially women – through engagement in production and facilitating access to markets.

Three main activities have been carried out under this project, all of which have been implemented in two Traditional Areas (TAs) of Chiradzulu District. Firstly, the partners have facilitated the creation of, and provided capacity-building support for, village savings and loans (VSL) groups with almost exclusively female membership. Approximately 180 groups have been established across 81 different villages, each with between 15 and 25 members who meet each week and make savings deposits. The savings deposits are used to make loans to group members, with loan sizes and payment terms decided by the group. The second component of the project involved supporting smaller groups of households in horticultural production (particularly the production of tomatoes), by providing training, technical support and inputs. Fifty households were supported in horticulture production during the first two years of the project's lifetime, with the number expanded to 282 households since November 2011. Finally, the project has supported 56 groups, each consisting of seven to ten households, in establishing piggery units. The partners provided five hybrid pigs for each group, as well as materials for construction of the piggery units and an initial supply of feed. The pigs are intended to be bred for sale in markets; however, epidemics of African swine fever in 2011 and in early 2013 severely affected the local pig population, and are thought to have limited the impact of these activities to date.

Complementing these activities, the partners have also carried out activities to raise awareness of women's rights, and to reduce the acceptance of gender-based violence in communities in the project area.

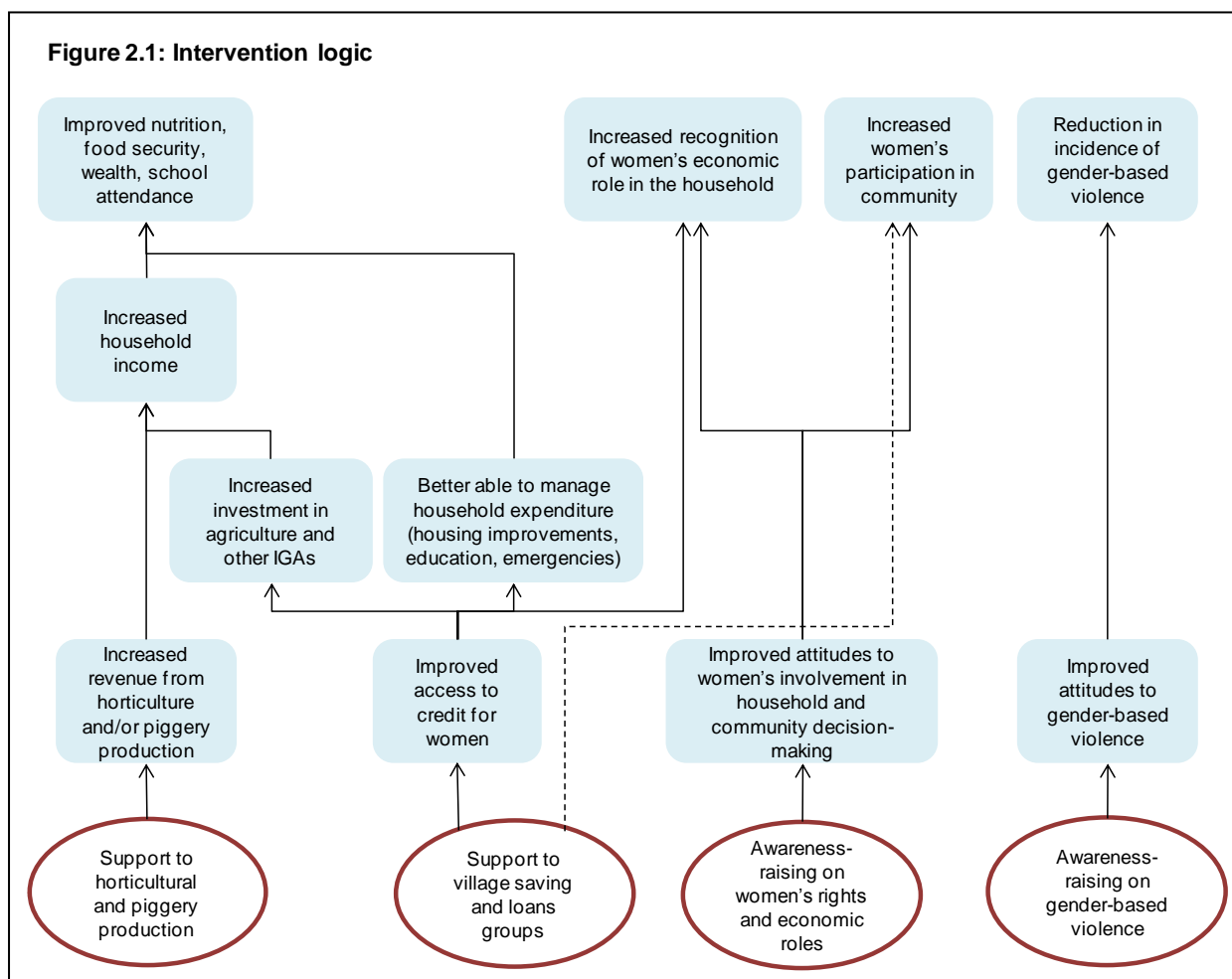
This Effectiveness Review attempted to assess the impact of each of these activities on the livelihoods of VSL members and others supported by the project, and particularly to understand how these have affected women’s positions in their households and communities.

Section 2 of this report reviews the intervention logic of the project under consideration. Section 3 and Section 4 follow by presenting the impact evaluation design that was used and the methods of data collection and analysis, respectively. Section 5 presents the results of the analysis of the data. Section 6 concludes with a summary of the results and some programme learning considerations.

## 2 Intervention logic of the project

Figure 2.1 presents a simple logic model illustrating how the project activities under review were intended to result in their intended outcomes.

The central intervention of this project, supporting the establishment of village savings and loans groups, has three main objectives. The first objective is that, by providing a sustainable means of accessing credit, women would be better able to manage household expenditure, and also to invest in agricultural inputs, in small businesses, or in other productive activities. Over time, this should result in an improvement in overall household wellbeing – including in household diet and food



security, ownership of assets, and other indicators. The support provided by the project to specific households in horticulture and piggery production was also intended to bolster household income and produce positive wellbeing improvements.

At the same time, the fact that women have access to funds from the VSL groups (and, ideally, are generating income from new or increased productive activities) means that they are likely to be making an increased contribution to overall household income. It is expected that this will lead to better recognition of women's roles in livelihoods activities, and hence to a gradual improvement in women's position in decision-making at the household level. The creation of the VSL groups as a new community-level structure for which women take on the management and responsibility (as well as, to a lesser extent, the horticulture and piggeries groups) is also expected to change the perception of women's potential to contribute to community affairs. In particular, the partners sought to build women's capacity by providing training to office-holders from each group on leadership, listening skills, assertiveness and public speaking.

The hoped-for changes in recognition of women's roles at household and community level are reinforced by the training provided to most VSL members – as well as some men from their communities – in women's rights. Subjects covered in these workshops included discussions of how women's rights are often violated, and how to claim rights. Gender-based violence had been identified in previous programme work to be a particular problem, so these workshops included a strong component aimed at reducing the acceptability of violence among both men and women.

### 3 Impact assessment design

#### 3.1 Limitations in pursuing the 'gold standard'

A social programme's net effect is typically defined as the average gain participants realise in outcome (e.g. improved household food security) from their participation. In other words:

**Impact** = *average post-project outcome of participants minus what the average post-project 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, community, etc. cannot *simultaneously* participate and not participate in a programme. The counterfactual state 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 their a) pre-programmes outcomes (e.g. both groups have the

*The Effectiveness Review attempted to ascertain what would have happened in the intervention communities had the project not been implemented.*

same average incomes); and b) observed characteristics (e.g. education levels) and unobserved characteristics (e.g. motivation) relevant to 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 as differential attrition and intervention spillover are minimal – any observed outcome differences observed at follow-up between the groups can be attributed to the programme.

However, implementing an ideal impact assessment design like this is only possible if it is integrated into the programme 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 Effectiveness Review – or one where randomisation is judged to be impractical, it is therefore necessary to apply alternative techniques to approximate the counterfactual as closely as possible.

### **3.2 Alternative evaluation design pursued**

When the comparison group is non-equivalent there are several evaluation designs that can identify reasonably precise intervention effects – particularly when certain assumptions are made. One solution is offered by ‘matching’: finding units in an external comparison group that possess the same characteristics, e.g. ethnicity, age, and sex, relevant to the outcome variable as those of the intervention group and matching them on the bases of these characteristics. If matching is done properly in this way, 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. Typically, the end result is that only a few units from the intervention and comparison groups get matched up. This not only significantly reduces the size of the sample but also limits 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.)

Fortunately, matching on the basis of the propensity score – the conditional probability of being assigned to the programme group, given particular background variables or observable characteristics – offers a way out. Propensity-score matching (PSM) works as follows. Units from both the intervention and comparison groups are pooled. 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 relevant to the outcome lurking among the groups, PSM is capable of identifying unbiased intervention effects.

*In an attempt to mitigate bias in estimates of outcomes, two statistical procedures were used: propensity-score matching and multi-variable regression.*

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 in the model. 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 unmeasured (or improperly measured) but relevant differences exist between the groups.<sup>1</sup> Both PSM and multivariable regression were used to analyse the data collected under this Effectiveness Review, and efforts were made to capture key explanatory variables believed to be relevant in terms of the assessed outcomes, e.g. sex and age of household head, education levels, etc. (see Section 4).

While no baseline data were available, efforts were made, as explained below, to reconstruct it through respondent recall. This method does have limitations, e.g. memory failure, confusion between time periods, etc. However, for data that can be sensibly recalled, e.g. ownership of particular household assets, it can serve to enhance the validity of a cross-sectional impact evaluation design. The reconstructed baseline data were used in two ways: First, several of the variables included in the PSM and regression procedures were baseline variables constructed from recalled baseline data. For example, one variable was related to the respondent’s wealth status at baseline, derived through the construction of a household wealth index based on asset ownership and other wealth indicators. This was done in an attempt to control for baseline wealth differences between the intervention and comparison groups.

The second way the reconstructed baseline data were used was to derive pseudo difference-in-difference intervention effect estimates. With longitudinal or panel data, this is implemented by subtracting each unit’s baseline measure of outcome from its endline measure of outcome (i.e. endline outcome status minus baseline outcome status). The intention here is to control for time invariant differences between the groups. Bearing in mind the limitations associated with recalled baseline data, using PSM and/or regression and the difference-in-difference approaches together is considered to be a strong quasi-experimental impact evaluation design.

### 3.3 Selection of project participants and comparison households

A key factor in ensuring the validity of any non-randomised impact evaluation design is to use an appropriate comparison group. This is particularly true for ex-post, cross-sectional designs. Comparators that differ in relevant baseline characteristics and/or that are subjected to

<sup>1</sup> One of the MVR procedures that was used attempted to control for possible unobserved differences between the groups. This is the Heckman selection model or two-step estimator. Here, efforts are made to directly control for the part of the error term associated with the participation equation that is correlated with both participation and non-participation. The effectiveness of this method, however, depends, in part, on how well the drivers of participation are modelled.

different external events and influences are likely to result in misleading conclusions about programme impact. Identifying a plausible comparison group is therefore critically important and is, generally speaking, not an easy task in non-experimental work.

The project under review was being implemented in one traditional area (TA) and one sub-TA of Chiradzulu District. Within these two areas, the project was implemented in 11 group village headman areas (GVH), each consisting of several communities. Other GVHs existed within the same TA and sub-TA, where the activities had not been implemented. The Effectiveness Review team worked with the partners to identify GVHs neighbouring those where the project had been implemented, with similar demographic characteristics and similar livelihoods activities, terrain and access to infrastructure, but where neither CAVWOC nor other organisations had implemented any similar activities. Six GVHs were identified that were considered suitable for comparison purposes, corresponding to seven of the GVHs where the project had been implemented. There were no areas suitable for comparing with the remaining four implementation GVHs, so these were excluded from the Effectiveness Review.<sup>2</sup>

*Communities were selected for comparison purposes in GVHs neighbouring – and with similar characteristics to – those where the project was implemented.*

Within the seven implementation GVHs selected included in the Effectiveness Review, specific VSL groups were selected at random, and members of those groups were also then selected at random for interview. In each of the communities the survey team visited (by virtue of a VSL group in that community having been randomly selected), any and all horticulture participants based in that community were also selected for interview. Piggery participants were not deliberately targeted for interview, both because the piggery activities were thought not to be mature enough for specific evaluation at this stage, and also because a reasonable number of piggery group participants was expected to be sampled randomly when selecting among VSL members.

The question of how to select respondents in the comparison GVHs was more complicated. Those who had participated in the project activities had all taken a decision to opt in to those activities, by joining a VSL group or a piggery or horticulture group. It could be seen, therefore, that these women are likely to differ from other women in their communities in terms of their assertiveness, initiative or motivation, even before participating in the project activities. However, the extent of this phenomenon should not be exaggerated. Although the founding members of the VSL group in each community are likely to have been those with a particular motivation or drive, the membership of these groups has since expanded to include a wider range of women from the community. Newer members are observed often to have social or family ties to existing members, rather than having particularly entrepreneurial characteristics. On the other hand, most VSL groups were thought to require that women have some livestock or small commerce activity before becoming members.

A key question, then, was how to identify those women in comparison communities who *would have* joined these groups had they been given

<sup>2</sup> In one GVH, Kalunwe, a VSL group had been established in only one of the 11 villages. For comparison purposes, the survey was carried out in some of the 10 non-implementation villages, while the single implementation village was excluded from the Effectiveness Review.

the opportunity. Consideration was given to whether there were any women's group structures in comparison communities for which the membership was likely to be analogous to those of the VSL groups. Unfortunately, the only groups of women involved in savings or loans schemes in comparison communities had been created for particular small-scale projects, and had a small, probably highly selected, memberships. The solution adopted was to take for comparison purposes a random sample of all women in the comparison communities, and then to use propensity-score matching to identify those women in the comparison communities who were comparable to the VSL members, and to the participants in the horticulture and piggery interventions, as appropriate.

The full list of variables on which matching was performed is detailed in Table 5.1. As well as standard demographic characteristics and indicators of wealth status, it was seen as particularly important to match the groups on the basis of whether the individual reported that she or her household were engaged in rearing livestock, petty commerce or other household businesses before the project's launch, and in what community groups she was participating in at that time. These are the variables that are thought to be most closely linked to a woman's decision to participate in a VSL group or one of the other project activities.

## 4 Methods of data collection and analysis

### 4.1 Data collection

A survey of women in the two districts was carried out in order to implement the evaluation design described in Section 3. Data was captured on various aspects of women's empowerment – including the steps of the project's intervention logic presented in Section 2 – as well as for key demographic and recalled baseline characteristics of the interviewed households. The questionnaire was administered by a team of enumerators, supervised by an external consultant.

Within the seven group village headman areas (GVHs) in which the Effectiveness Review was carried out, the project had established a total of 115 village savings and loans (VSL) groups. It was considered feasible to interview members of a maximum of 38 of these groups. These 38 groups were selected at random, stratified by GVH. Since there were multiple groups in some communities, the sample of 38 groups was distributed across a total of 26 communities. CAVWOC staff then visited the randomly selected groups and compiled a list of members of each. A number of respondents were selected at random within each group, proportional to the size of the group, using systematic random sampling.

Within the 26 communities that were to be visited for the survey, all those households that were supported under the horticulture were listed and targeted for interview, whether or not they were members of the selected VSL groups. For this reason, the horticulture participants who were interviewed are not a sample of the participants, but represent the total population of the participants in those 26 villages (excluding those who were not available for interview at the time). The horticulture component of the project supported the household as a whole, but in

*Within the seven GVHs where the Effectiveness Review was carried out, VSL groups were selected at random to be included in the survey.*

each case it was the senior female household member who was interviewed.

In the comparison communities, respondents were not identified in advance of the survey team’s visit. On arriving in each of these communities, the survey team obtained consent from community leaders to carry out the survey, and then worked to make a list of all the households in the community, before selecting respondents using systematic random sampling. For each household selected, the senior female household member was targeted for interview.

The list of GVHs in which the survey was carried out, and the numbers of women interviewed, are shown in Table 4.1.

**Table 4.1: Intervention and comparison districts and sample sizes**

TA/Sub-TA	Implementation GVH	VSL members surveyed <sup>1</sup>	Horticulture participants surveyed <sup>1</sup>	Comparison GVH	Women surveyed
Onga	Chingoli	28	6	Chapola	41
	Kumitete	11	6	Masala	40
	Onga	36	12		
Likoswe	Nkongga	22	1	Kalunwe <sup>2</sup>	42
	Sumani 1	33	5	Mataka	163
	Sumani 2	34	3	Pemba	46
	Manguwo	21	9	Ndanga	45
<b>Totals</b>		<b>185</b>	<b>42</b>		<b>377</b>

<sup>1</sup> Three respondents were randomly selected in the sample of VSL members, but also participated in the horticulture component: these respondents have been included in both columns of the table.

<sup>2</sup> The project was implemented in one village in GVH Kalunwe. Respondents were selected from the 10 villages where the project had not been implemented.

## 4.2 Data analysis

Oxfam developed a data-entry interface in Adobe Acrobat, and data entry was carried out by staff in Oxfam’s office in Hodeida. Data analysis was carried out in Stata by staff from OGB’s office in Oxford.

The results of this analysis are presented in Section 5. Most of the analyses involved group mean comparisons using *t*-tests, as well as propensity-score matching (PSM) with the *psmatch2* module and various multivariate regression models. PSM was implemented using both kernel and nearest-neighbour matching without replacement. Backwards stepwise regression was used to identify those variables correlated with either being in an intervention village or a famer group at *p*-values greater than 0.2. Covariate balance was checked following the implementation of each matching procedure, and efforts were made to ensure that the covariates were balanced across groups at *p*-values greater than 0.2. Bootstrapped standard errors enabled the generation of confidence intervals for statistical hypothesis testing.

In the tables of outcome estimates in Section 5, the results are only shown for the PSM kernel model. The coefficients derived from the PSM kernel model in each case were compared to that of the PSM nearest-neighbour model, and also of three multivariate regression models: a) regression with robust standard errors (to address issues of heteroscedasticity), restricted to observations in the area of common support from the PSM kernel model; b) robust regression (to reduce the influence of outliers), again restricted to observations in the area of

common support from the PSM kernel model; and c) regression with Heckman control functions (to attempt to control for relevant unobserved differences between the intervention and comparison groups). Where the magnitude or statistical significance of the coefficients derived from the various models varies widely, this has been noted in the text and has been taken into account in the interpretation of the results.

## 5 Results

### 5.1 General characteristics

Table 5.1 presents summary statistics on the demographic and baseline characteristics contained in the survey, and compares the averages between the households that had been supported by the project (the 'intervention' households) and the comparison households. The asterisks beside the number indicate differences in averages between the groups that are statistically significant at a 90 per cent confidence level or greater.

There are some important differences between the households in the communities where the project was implemented and those in comparison communities. In particular:

- Households in the project area were significantly larger.
- Households of VSL members and horticulture participants generally have higher levels of education than those of comparison households. For example, the proportion of VSL members with some secondary education is more than double that among the comparison households.
- VSL members were considerably more likely to be engaged in petty commerce, larger household businesses and raising livestock before the project started in 2009 than were comparison households, according to the recalled baseline data.
- Households of horticulture participants were also more likely to be involved in petty commerce, and much less likely to be engaged in casual agricultural or non-agricultural labour in 2009.
- Households of project participants (both VSL members and horticulture participants) were farming 50 per cent more land in 2009 than were comparison households, and produced a wider range of crops.
- Households of project participants were involved in a wider range of community groups in 2009 (always according to the data recalled from that time), and perhaps are significantly more likely to be involved in area and village development committees.
- Project participants' households were significantly wealthier in 2009 than were households in the comparison area. For example, 41 per cent of the VSL members' households were in the top third of households surveyed in terms of the 2009 wealth index,<sup>3</sup> as were 52 per cent of the horticulture participants – compared to only 27 per cent of the comparison households. Only 10 per cent of the horticulture participants were in the poorest third of the sample in 2009.

*Project participants were significantly wealthier, better educated and more involved in household businesses and community groups, according to the recalled 2009 baseline data, than were the average comparison respondent.*

<sup>3</sup> The construction of the wealth index is described in Section 5.3.6 below.

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**Table 5.1: Descriptive statistics: covariate comparison between treatment groups**

	VSL component				Horticulture component			
	Intervention	Comparison	Difference	t-statistic	Intervention	Comparison	Difference	t-statistic
	Mean	Mean			Mean	Mean		
Number of members of household	4.968	4.637	0.331**	2.00	6.048	4.637	1.411***	4.74
Number of adults	2.697	2.363	0.334***	3.45	2.786	2.363	0.422***	2.65
Number of adults who are fit and able to work	2.551	2.263	0.289***	3.09	2.690	2.263	0.428***	2.68
Only one adult in household	0.097	0.114	-0.017	-0.60	0.095	0.114	-0.019	-0.37
No male adults in household	0.173	0.212	-0.039	-1.09	0.143	0.212	-0.069	-1.05
All adults in household are aged over 60 years	0.038	0.048	-0.010	-0.53	0.000	0.048	-0.048	-1.45
Household head is Christian	0.957	0.867	0.089***	3.30	0.857	0.867	-0.010	-0.18
Age of respondent	38.838	39.374	-0.536	-0.42	36.881	39.374	-2.493	-1.11
Respondent is fit and able to work	0.989	0.979	0.010	0.88	0.976	0.979	-0.003	-0.11
Respondent is married	0.692	0.684	0.008	0.18	0.786	0.684	0.101	1.35
Respondent is able to read and write a simple letter	0.643	0.605	0.038	0.88	0.762	0.605	0.157**	2.00
Respondent has some primary education	0.865	0.844	0.021	0.67	0.881	0.844	0.037	0.64
Respondent has some secondary education	0.184	0.090	0.094***	3.22	0.143	0.090	0.053	1.10
Number of adults in household with some primary education	2.427	2.119	0.308***	3.08	2.619	2.119	0.500***	2.95
Number of adults in household with some secondary education	0.735	0.525	0.210***	2.82	0.881	0.525	0.356***	2.86
Productive activities engaged in by household members in 2009:								
Farming	0.984	0.987	-0.003	-0.28	0.976	0.987	-0.011	-0.54
Agricultural labour	0.589	0.613	-0.024	-0.54	0.357	0.613	-0.256***	-3.22
Non-agricultural casual labour	0.232	0.247	-0.014	-0.37	0.095	0.247	-0.151**	-2.21
Rearing livestock	0.697	0.462	0.236***	5.39	0.595	0.462	0.134	1.65
Petty commerce	0.611	0.326	0.285***	6.66	0.571	0.326	0.245***	3.19
Larger household business (e.g. shop)	0.059	0.008	0.052***	3.72	0.024	0.008	0.016	1.00
Artisan	0.189	0.141	0.049	1.49	0.119	0.141	-0.022	-0.38
Regular formal employment	0.178	0.215	-0.036	-1.01	0.214	0.215	-0.001	-0.01
Productive activities engaged in by respondent in 2009:								
Farming	0.968	0.973	-0.006	-0.40	0.952	0.973	-0.021	-0.78
Agricultural labour	0.486	0.538	-0.052	-1.16	0.310	0.538	-0.229***	-2.84
Non-agricultural casual labour	0.178	0.183	-0.005	-0.13	0.071	0.183	-0.112*	-1.82
Rearing livestock	0.616	0.416	0.200***	4.53	0.476	0.416	0.060	0.74
Petty commerce	0.578	0.239	0.340***	8.40	0.500	0.239	0.261***	3.69
Larger household business (e.g. shop)	0.054	0.005	0.049***	3.80	0.024	0.005	0.019	1.35
Artisan	0.049	0.021	0.027*	1.79	0.071	0.021	0.050*	1.93
Regular formal employment	0.027	0.048	-0.021	-1.16	0.048	0.048	-0.000	-0.00
Number of acres cultivated by the household in 2009	2.154	1.345	0.808***	7.46	2.018	1.345	0.673***	4.35
Number of crop types cultivated by the household in 2009	3.778	3.141	0.638***	4.60	4.524	3.141	1.383***	5.68
Respondent was participating in village development committee in 2009	0.308	0.241	0.067*	1.69	0.214	0.241	-0.027	-0.39
Respondent was participating in area development committee in 2009	0.205	0.146	0.060*	1.79	0.190	0.146	0.045	0.77
Number of other community groups in which respondent was participating in 2009	1.622	1.347	0.274**	2.07	1.976	1.347	0.629***	2.59
Wealth index 2009†	0.516	-0.374	0.890***	3.72	1.109	-0.374	1.483***	3.68
Poorest third in 2009†	0.259	0.395	-0.136***	-3.19	0.095	0.395	-0.300***	-3.89
Middle third in 2009†	0.330	0.332	-0.002	-0.04	0.381	0.332	0.049	0.64
Wealthiest third in 2009†	0.411	0.273	0.138***	3.32	0.524	0.273	0.251***	3.41
Household has received food aid during past 12 months	0.049	0.064	-0.015	-0.72	0.119	0.064	0.055	1.34
Household has received fertiliser coupons during past 12 months	0.908	0.875	0.033	1.16	0.976	0.875	0.101*	1.96
Household has received cash transfers from an NGO during past 12 months	0.027	0.032	-0.005	-0.32	0.000	0.032	-0.032	-1.17
Household has received donations of agricultural inputs during past 12 months	0.119	0.074	0.044*	1.74	0.476	0.074	0.402***	8.35
Household has received donations of livestock during past 12 months	0.049	0.043	0.006	0.33	0.143	0.043	0.100***	2.78
<b>Observations</b>	<b>185</b>	<b>377</b>	<b>562</b>		<b>42</b>	<b>377</b>	<b>419</b>	

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

† The construction of the wealth index is described in Section 5.3.6.

Many of these differences are not surprising, given that the participants in the VSL groups and the horticulture activities are self selected (as discussed in Section 3.3 above), whereas the comparison respondents were a random sample from among their communities. For example, it seems reasonable that households that are generally wealthier than average and with more involvement in existing community institutions would be likely to participate in a new initiative, such as those introduced under this project.

For these reasons, it is particularly important to control for these demographic and baseline differences when making estimates of the project's impact. All the variables listed in Table 5.1 have been controlled for in the PSM and regression models used to derive the results presented in Section 5.3.

## 5.2 Differences between the supported and comparison households in exposure to the project activities

As discussed in Section 2, the project involved not only establishing the VSL groups, but also providing various forms of training to group members, such as on running a household business. Subgroups of the members were also specifically selected to receive training and support in horticulture production and in running piggeries.

*As expected, much larger numbers of the project participants reported receiving training over the 12 months prior to the survey than did the comparison respondents.*

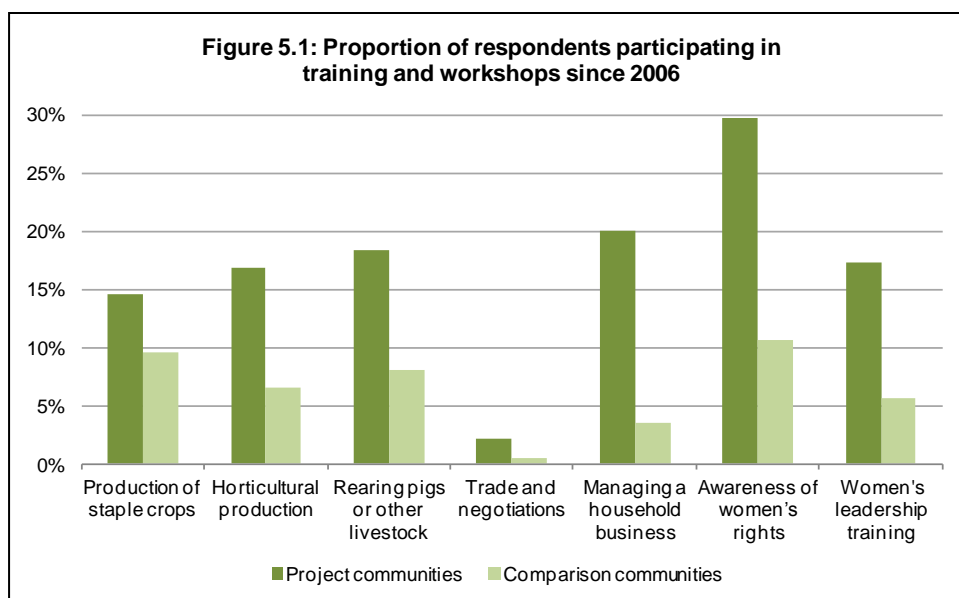
In the questionnaire, all respondents were asked what kinds of training and awareness-raising activities they had participated in during the 12 months prior to the survey. The results are shown in Table 5.2, and graphically in Figure 5.1. As expected, there are large differences between the project and comparison communities in terms of the proportions of respondents who had participated in each of these forms of training. Interestingly, in the majority of cases, participation in these training and events is said to have been exclusively for women – even training that was provided on agricultural production.

The results of these questions also confirm that the majority of those included in the horticulture component and the piggery component of the project recalled having received training on these issues in the recent past. Nearly three quarters of those in the horticulture component reported having received some training on horticulture production, and 53 per cent of those in the piggery component recalled having received some training on rearing livestock. Less than 10 per cent of households in the comparison group had received training in either area.

**Table 5.2: Differences in the proportions of respondents reporting participation in training or other events during the 12 months prior to the survey**

	Sample of VSL members				Horticulture participants			
	Intervention Mean	Comparison Mean	Difference	Standard error of difference	Intervention Mean	Comparison Mean	Difference	Standard error of difference
Training on production of staple crops	0.146	0.096	0.050*	0.028	0.310	0.096	0.214***	0.051
Training on horticultural production	0.168	0.066	0.101***	0.027	0.738	0.066	0.672***	0.045
Training on rearing pigs or other livestock	0.184	0.080	0.104***	0.028	0.310	0.080	0.230***	0.048
Training on trade and negotiations	0.022	0.005	0.016*	0.009	0.143	0.005	0.138***	0.021
Training on managing a household business	0.200	0.035	0.165***	0.025	0.310	0.035	0.275***	0.037
Training or information for awareness of women's rights	0.297	0.106	0.191***	0.033	0.405	0.106	0.298***	0.054
Leadership training for women	0.173	0.056	0.117***	0.026	0.214	0.056	0.158***	0.041
<b>Observations</b>	<b>185</b>	<b>377</b>	<b>562</b>		<b>42</b>	<b>377</b>	<b>419</b>	

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



### 5.3 Differences between the supported and comparison households on the outcome measures

This section will examine the differences between women in the communities where the project was implemented and women in the comparison communities in terms of the various outcome measures examined in the survey. The first subsection deals with differences in access to and use of credit, and the second with whether there is evidence for resulting differences in indicators of material wellbeing. Section 5.3.3 considers outcomes relating to attitudes towards early marriage. The remaining subsections examine outcomes on women's empowerment.

#### 5.3.1 Increased savings

As discussed in Section 2, the key intervention made under this project was the establishment of village savings and loans (VSL) groups, in order to provide women with a secure and usable savings facility and to mobilise those savings in the form of credit for group members. We begin by considering the impact of this work on savings deposits. Table 5.3 shows the differences between the supported and comparison women in terms of various indicators of their savings behaviour. The top section of the table shows the overall results across the two governorates, while the other two sections show a breakdown for each governorate separately. In each section, the unadjusted data are presented first, followed by the estimate of the difference derived from the propensity-score matching model. This PSM estimate should normally be considered a better estimation of the true difference between the supported and comparison women than the unadjusted figures.<sup>4</sup>

<sup>4</sup> Estimates of the difference in each outcome measure in this report were also derived using a PSM model using nearest-neighbour no-replacement matching, as well using a standard regression model with robust standard errors, a regression model with Heckman control functions, and (for continuous measures only) a robust regression model. The estimates derived from these models are not detailed in this report, but they are comparable in magnitude and statistical significance to those derived from the PSM kernel models. Any large discrepancies in the estimates derived from the various models are discussed in the text.



The first indicator examined was whether the respondent reported that she personally has any savings, in any form. It can be seen in column 1 of Table 5.3 that all of the VSL members interviewed reported having some savings, compared to only half of the comparison respondents (and that the difference is almost as large even under PSM analysis). Respondents were not asked directly for the value of their savings, but instead were asked for how many days their household could survive on those savings, if there were an emergency and no other funds were available. On average the VSL group members said that their savings would support their households for just over two weeks (though the median figure was only seven days). As can be seen in column 2, this figure was far larger than among the comparison respondents, where the mean was only five days.

*Almost all the VSL members reported having made some savings during the month prior to the survey, but only 13 per cent of the comparison respondents.*

In a separate set of questions, respondents were asked whether they had made any savings during the month prior to the survey. Column 3 of Table 5.3 shows that approximately 45 per cent of respondents reported that they had saved cash at home, and this figure did not differ between the VSL members and comparison respondents. However, as would be expected, nearly all the VSL members had made some deposits in a VSL group during the previous month. Only 13 per cent of women in comparison communities reported having made any savings deposits during that month (either in a group or by giving money to a friend or neighbour to take care of, or – in a very small number of cases – making deposits at a formal financial institution).

**Table 5.3: Comparison of supported and comparison women in terms of savings**

	1	2	3	4
	Respondent has any savings (binary)	Number of days household could live from respondent's savings deposits	Respondent saved cash at home during past month (binary)	Respondent made savings deposits in VSL or elsewhere during past month (binary)
<b>Sample of VSL members</b>				
<b>Unadjusted</b>				
Intervention group mean:	1.000	17.424	0.459	0.978
Comparison group mean:	0.509	5.003	0.454	0.130
Unadjusted difference:	0.491***	12.422***	0.006	0.848***
	(0.037)	(1.542)	(0.045)	(0.026)
<b>Observations:</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>562</b>
<b>PSM</b>				
Post-matching difference: (kernel)	0.465***	12.577***	-0.035	0.827***
	(0.050)	(2.133)	(0.061)	(0.037)
<b>Observations:</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>547</b>

Standard errors in parentheses  
 \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$   
 PSM estimates bootstrapped 1000 repetitions.

### 5.3.2 Access to and use of credit

To assess the VSL groups' effect on access to credit, survey respondents were asked to imagine that they needed 10,000 kwacha (approximately US\$30) to make a business investment, and were asked whether and from which sources they would be able to borrow this sum. Almost all of the VSL group members reported that they would have access to some source for this credit, against just over 60 per cent of women in comparison communities – these figures are shown in the top section of column 1 of Table 5.4. Column 2 shows that the VSL

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members said they had access to 1.4 sources of credit, on average, compared to only 0.9 sources among the comparison women. Members of the VSL groups were considerably less likely to mention relatives or neighbours as potential sources of credit than were women in the comparison communities.

**Table 5.4: Comparison of supported and comparison women in terms of access to credit**

	1	2	3	4	5	6	7
	Has at least one potential source of credit (binary)	Number of potential sources of credit	Household has borrowed at least once in past 12 months (binary)	Number of loans borrowed since 2006	Household has borrowed from VSL group in past 12 months (binary)	Number of times borrowed from VSL group in past 12 months	Largest loan borrowed in past 12 months (kwacha)
<b>Sample of VSL members</b>							
<b>Unadjusted</b>							
Intervention group mean:	0.989	1.411	0.962	3.369	0.946	2.994	8486
Comparison group mean:	0.613	0.859	0.345	0.729	0.090	0.199	1579
Unadjusted difference:	0.376***	0.551***	0.617***	2.639***	0.856***	2.796***	6907***
	(0.036)	(0.079)	(0.036)	(0.159)	(0.024)	(0.121)	(512)
<b>Observations:</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>556</b>	<b>562</b>	<b>557</b>	<b>539</b>
<b>PSM</b>							
Post-matching difference: (kernel)	0.317***	0.455***	0.566***	2.535***	0.842***	2.792***	5723***
	(0.044)	(0.098)	(0.050)	(0.259)	(0.038)	(0.178)	(610)
<b>Observations:</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>542</b>	<b>547</b>	<b>543</b>	<b>524</b>

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

Columns 3 to 7 of Table 5.4 report results on actual loans that they or other household members had borrowed during the 12 months prior to the survey. From column 3, it can be seen that almost all (96 per cent) of VSL members reported that their households had taken out at least one loan during that 12-month period, and column 5 shows that most of those women had taken at least one loan specifically from the VSL group. In the comparison communities, only a third of respondents reported that their household had taken out any loans during the past 12 months.<sup>5</sup>

One complication in interpreting these results is that (as has been found in other contexts) respondents may be reluctant to discuss borrowing behaviour with people outside the household. Potentially, membership of the VSL groups may have encouraged women to regard the use of credit as more socially acceptable, and so would made them less reluctant than women in comparison communities to discuss their borrowing during the course of the survey. However, it seems unlikely that this effect could account fully for all the differences found in Table 5.4 – for example, it is probably less likely to affect responses on the sizes of loans borrowed. When VSL members were asked for the size of the largest loan borrowed by their household during the past 12 months, the median response was 6,000 kwacha, with a mean (as shown in column 7 of Table 5.4) of 8,500 kwacha; the median among comparison households who reported having borrowed at all was only 3,000 kwacha, and the mean was 4,300 kwacha. This implies that not only do far fewer of the comparison women report having borrowed at all than among the VSL members, but also the size of the loans available to

<sup>5</sup> Nine per cent of women in comparison communities also reported having borrowed from a VSL group; in another section of the survey, the same proportion reported being members of a VSL group. This perhaps reflects membership of some other form of village mutual savings or credit group – perhaps through the actions of a different NGO project – or potentially from people locally replicating the VSL groups they have observed in neighbouring communities.

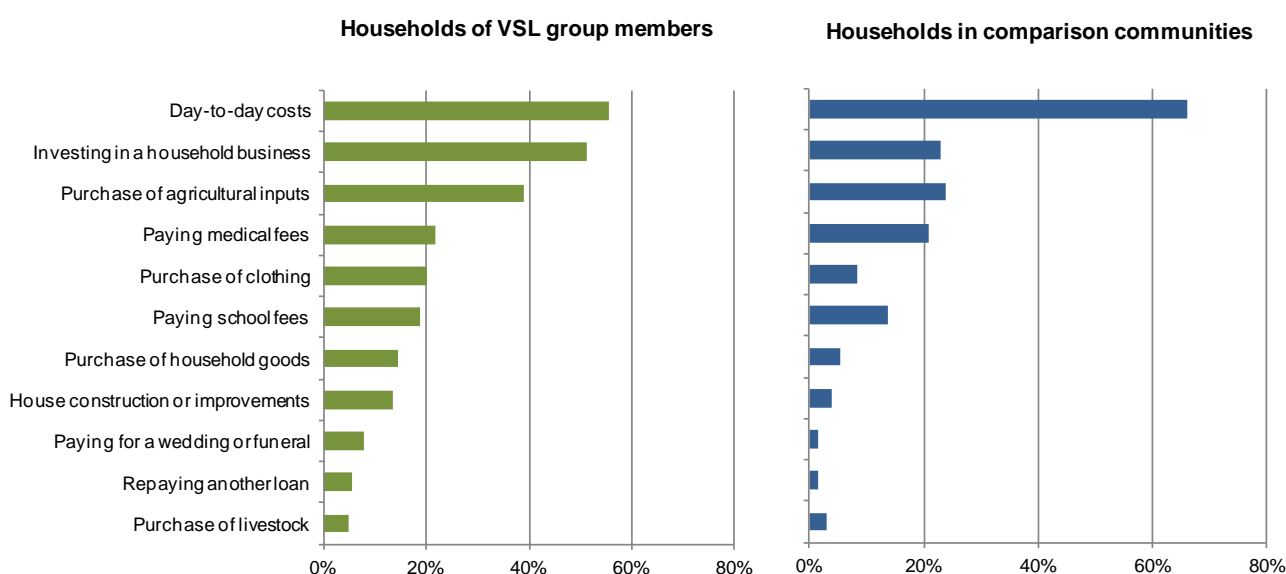
them was considerably smaller. There does appear, then, to be strong evidence that the VSL groups have had a significant effect on their members' access to credit.

*VSL members appeared to have much better access to loans, and to have actually borrowed more, than respondents in comparison communities.*

Of course, the project was concerned not simply with providing credit to households, but with putting credit into the hands of women. Respondents were asked, the last time they borrowed, which member of their household was mostly responsible for decisions over whether and how much to borrow, from each source. In the majority of households that had borrowed at least once during the past 12, the respondents said that they personally (or another female household member) was the main decision maker: this applied both in the cases of VSL members and in comparison respondents that had taken out some loan. However, it is important to note that that the proportion of VSL members who said that they were personally responsible for decisions over borrowing in their households was only 71 per cent. That is, in more than a quarter of cases, the female VSL members said that their husbands were taking the decisions over borrowing from the VSL group.

Figure 5.2 shows the breakdown of the activities that respondents reported they and other household members have used credit for in the 12 months prior to the survey. Although using credit for day-to-day costs (such as buying food) was cited by more than half the members of VSL groups interviewed, only 20 per cent of them said that this was the *main* use of their last loan – compared to nearly half of those in comparison communities who had borrowed. Those in the comparison communities were also more likely to report that they had used credit for medical emergencies, or to make housing improvements. Members of the VSL groups were significantly more likely to say that they had used their loans for productive investments, such as in household businesses or in purchasing agricultural inputs.

**Figure 5.2: Uses of all loans borrowed by respondents' households during past 12 months**



### 5.3.3 Women’s engagement in household business

Since a large proportion of the VSL members reported taking out loans in order to invest in household businesses, it is of interest to examine whether the project has had some effect on members’ (and their households’) engagement in small business activities.

*VSL members were much more likely to have started engaging in petty commerce over the project’s lifetime than were women in comparison communities.*

It was not possible in the course of this short survey to collect detailed information about household business activities. However, all respondents were asked whether they and/or other household members were engaged either in petty commerce or in running a small business, such as a grocery shop. As can be seen in column 1 of Table 5.5, more than 70 per cent of VSL members reported that some member of their household is engaged in petty commerce, double the rate among women in comparison communities. After adjusting for demographic and recalled baseline variables, the difference between the households of VSL members and comparison households is estimated to be at least 17 percentage points (the PSM nearest-neighbour model and the regression models tested produce higher estimates than that of the PSM kernel model shown in Table 5.5). In column 2, whether the respondent recalled the household having been engaged in petty commerce in 2009 was subtracted from the indicator of whether they were engaged in this at the time of the survey to produce an indicator of whether the household had adopted petty trade since 2009. The resulting ‘difference-in-difference’ estimates imply that households of VSL members were much more likely to have adopted petty commerce since 2009 than those in comparison households. In fact, in most cases it was the respondent herself who was engaged in this activity, so that the corresponding estimates for the respondent’s own activities (shown in column 3) are little different from those for the household as a whole.

The results in columns 4 to 6 of Table 5.5 correspond to those in columns 1 to 3, but relate to whether the household – or the respondent herself – was engaged in running a small business, such as a grocery shop. Although the estimates of the difference between households of VSL members and comparison households are positive, they are not

**Table 5.5: Comparison of women in project and comparison communities in terms of contribution to household income**

	1	2	3	4	5	6
	Household engages in petty commerce (binary)	Household engages in petty commerce (change since 2009)	Respondent personally engages in petty commerce (change since 2009)	Household runs a small business (binary)	Household runs a small business (change since 2009)	Respondent personally runs a small business (change since 2009)
<b>Sample of VSL members</b>						
<b>Unadjusted</b>						
Intervention group mean:	0.714	0.103	0.081	0.065	0.005	0.005
Comparison group mean:	0.358	0.032	0.037	0.019	0.011	0.003
Unadjusted difference:	0.355*** (0.042)	0.071* (0.041)	0.044 (0.040)	0.046*** (0.016)	-0.005 (0.017)	0.003 (0.014)
<b>Observations:</b>	562	562	562	562	562	562
<b>PSM</b>						
Post-matching difference: (kernel)	0.175*** (0.059)	0.226*** (0.060)	0.240*** (0.058)	0.018 (0.029)	0.023 (0.029)	0.031 (0.029)
<b>Observations:</b>	547	547	547	547	547	547

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

statistically significant, so do not provide good evidence of increased creation of these kinds of businesses. This is not surprising, since the small loans available from the VSL groups would probably not be sufficient to overcome any capital constraints their members have in establishing businesses larger than petty commerce.

Respondents were also asked to estimate the proportionate contribution that they make to their household's resources and income, both as of the time of the survey and in 2009. Table 5.6 shows the results derived from these questions: there is no evidence to suggest a difference between the project and comparison communities in the proportion of income coming from women.

**Table 5.6: Comparison of supported and comparison households and women in terms of contribution to household resources and income**

	1	2
	Respondent's proportionate contribution	Change in respondent's proportionate contribution since 2009
<b>Sample of VSL members</b>		
<i>Unadjusted</i>		
Intervention group mean:	0.535	0.013
Comparison group mean:	0.540	0.048
Unadjusted difference:	-0.006 (0.025)	-0.035* (0.018)
<b>Observations:</b>	562	562
<i>PSM</i>		
Post-matching difference: (kernel)	-0.002 (0.033)	-0.022 (0.031)
<b>Observations:</b>	547	547

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

### **5.3.5 Agricultural activities**

As discussed in Section 2, the project intended to affect agricultural outcomes in two different ways. Firstly, it was expected that some of the credit made available to households would be invested in agricultural inputs, particularly in the purchase of fertiliser. Secondly, a subset of the project participants received direct support to horticulture production. It is therefore important to consider the effect that these activities have had on agricultural production and sales.

Table 5.7 shows the estimated differences between households of respondents surveyed in the project communities and in the comparison communities in terms of various indicators of agricultural investment. The results among households that participated in the horticulture component of the project are shown separately, in the bottom section of the table.

Firstly, columns 1 and 2 show that since 2009 the households of VSL members had not significantly changed the quantity of land they were cultivating relative to households in the comparison communities. There is some evidence, however, that the participants in the horticulture component of the project did increase the area of their land under cultivation: while the PSM kernel estimate shown at the bottom of column 2 is not statistically significant, some of the other models produced an estimate that is significant at the 10 per cent level. This

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**Table 5.7: Comparison of supported and comparison households in indicators of agricultural investment**

	1	2	3	4	5	6	7
	Number of acres cultivated in past 12 months	Change in number of acres cultivated since 2009	Number of crop types grown in past 12 months	Change in number of crop types grown since 2009	Number of improved agricultural techniques applied in past 12 months	Change in number of improved agricultural techniques applied since 2009	Number of bags of fertiliser applied in past 12 months
<b>Sample of VSL members</b>							
<i>Unadjusted</i>							
Intervention group mean:	2.178	0.025	4.149	0.370	5.454	0.319	2.251
Comparison group mean:	1.529	0.184	3.397	0.256	4.446	0.255	1.415
Unadjusted difference:	0.649***	-0.159	0.752***	0.114	1.008***	0.064	0.836***
	(0.248)	(0.231)	(0.134)	(0.103)	(0.138)	(0.110)	(0.103)
<b>Observations:</b>	562	562	562	562	562	562	561
<i>PSM</i>							
Post-matching difference: (kernel)	-0.137	-0.177	0.197	0.148	0.485**	0.080	0.590***
	(0.349)	(0.331)	(0.207)	(0.146)	(0.192)	(0.145)	(0.142)
<b>Observations:</b>	547	547	547	547	547	547	546
<b>Horticulture participants</b>							
<i>PSM</i>							
Post-matching difference: (kernel)	-0.087	0.241	1.431**	1.379***	2.057***	0.758**	0.663**
	(0.353)	(0.184)	(0.628)	(0.422)	(0.533)	(0.346)	(0.324)
<b>Observations:</b>	399	399	399	399	399	399	399

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

would suggest that horticulture participants increased their land under cultivation over the course of the project by approximately quarter of an acre on average, relative to households in the comparison communities.

Columns 3 and 4 show differences between households in project and comparison communities in terms of the variety of crops grown. Again, both the differences in the absolute number of crop types grown in the 12 months prior to the survey, and the difference-in-difference measure of the change in number of crop types since 2009, are shown. As would be expected, the participants in the horticulture component of the project were clearly producing a greater variety of crops than those in the comparison communities. In particular, nearly all the horticulture participants (95 per cent) reported producing tomatoes during the year prior to the survey, with large proportions also producing onions, cabbage, green maize and nsawawa. Each of these crops was grown by only small minorities of households in the comparison communities (for example, only 17 per cent reported having produced any tomatoes in that year).

There may also be some evidence that crop diversity increased among the VSL members as well: while the PSM estimates are not statistically significant, those derived from the various regression models are, at least at the 10 per cent level.

Respondents were also asked whether their household used any of nine improved agricultural techniques:

- Crop rotation
- Mixed cropping
- Use of improved seed varieties
- Manure making

- Use of manure
- Use of chemical fertiliser
- Use of pesticide
- Irrigation
- Use of ridges and flat beds.

Several of these techniques were specifically encouraged under the horticulture component of the project. Column 5 of Table 5.7 shows that households of VSL members in general, and of horticultural participants in particular, on average reported applying more of these techniques than did households in comparison communities. Indeed, with the exception of crop rotation, very large majorities of the horticulture participants reported applying each of these different techniques. Comparison households were much less likely to be using pesticides, irrigation, or to be making or using manure. However, some of these differences between the project and comparison households are also observable in the data for when respondents were asked to recall the techniques in use by their households during 2009, suggesting that the differences may not be completely due to the project (though it is equally plausible that the respondents made errors in recalling these details from 2009). Anyway, the difference-in-difference measure in column 6 shows that the horticulture participants did increase their adoption of these techniques relative to the comparison households over the course of the project. The difference-in-difference measure does not provide evidence that there has been any corresponding increase in adoption of these techniques among VSL members more generally.

*Participants in the horticulture component of the project grew a wider range of crop types and applied more improved agricultural techniques than did comparison households.*

Column 7 of Table 5.7 shows the differences between households interviewed in project and comparison communities in terms of the number of bags of fertiliser the household had used in total during the 12 months prior to the survey. All types of fertiliser are added together here, to give an approximate indication of the level of investment. Almost all respondents reported having used some fertiliser during the past year. The comparison households had used 1.4 bags on average, while VSL members and horticulture participants had used 2.3 bags on average – a difference that is strongly statistically significant under each of the estimation methods applied. The fact that the number of bags of fertiliser applied does not differ significantly between the VSL members in general and the horticulture participants in particular, suggests that it was the access to credit that brought about this change, rather than the agricultural training and support provided under the horticulture component. And this apparent higher use of fertiliser accords with the result noted in Section 5.3.2, that nearly two in five VSL members said that they had used credit to purchase agricultural inputs.

Since we have identified some apparent systematic differences between the households supported by the project and households in comparison communities, it is important to consider what effect these had on agricultural production. The results of the relevant variables that were included in the survey are shown in Table 5.8. Firstly, columns 1 and 2 show the differences between surveyed households in project and comparison communities in terms of yields of maize and pigeon peas, the two crops that were grown by the majority of households in both project and comparison communities. (In the cases of horticultural products and other crops, too few of the comparison group grew these

**Table 5.8: Comparison of supported and comparison households in indicators of agricultural production**

	1	2	3	4	5	6
	Yield from maize during the past 12 months (kg per acre)	Yield from pigeon peas during the past 12 months (kg per acre)	Household made any crop sales in the past 12 months (binary)	Number of crop types sold in the past 12 months	Value of crop sales in past 12 months (kwacha)	Value of crop sales in past 12 months (logarithm of 1 + value in kwacha)
<b>Overall</b>						
<b>Unadjusted</b>						
Intervention group mean:	493.569	41.288	0.784	2.027	20,795	7.323
Comparison group mean:	440.751	44.225	0.629	1.172	8,591	5.543
Unadjusted difference:	52.818	-2.937	0.155***	0.855***	12,204***	1.780***
	(32.384)	(6.507)	(0.041)	(0.135)	(2,480)	(0.387)
<b>Observations:</b>	559	459	562	562	557	557
<b>PSM</b>						
Post-matching difference:	33.889	-15.217	0.070	0.418**	8,497**	0.847*
(kernel)	(52.204)	(10.702)	(0.050)	(0.196)	(3,485)	(0.468)
<b>Observations:</b>	544	446	547	547	542	542
<b>Horticulture participants</b>						
<b>PSM</b>						
Post-matching difference:	100.086	-20.452	0.266**	1.585**	29,443**	3.155***
(kernel)	(104.222)	(23.411)	(0.113)	(0.717)	(12,334)	(1.155)
<b>Observations:</b>	398	329	399	399	395	395

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

crops to make for a meaningful comparison of yield.) In neither case is there clear evidence of an increase in yields, despite the greater use of fertiliser among households in the project communities.

*The value of crops being sold was considerably higher among project participants among horticulture participants specifically, but also among the VSL members more generally.*

The questionnaire asked not just about crop production, but also about sales. Column 3 of Table 5.8 shows the differences between project and comparison communities in terms of the proportion of households who had sold any crops during the 12 months prior to the survey. Just under two-thirds of comparison households had sold some crops, whereas almost all (98 per cent) of the horticulture participants had done so. There is also a suggestion that the proportion of VSL members' households making crop sales was larger than the proportion among comparison households, though this difference is not statistically significant under the PSM kernel model.

Column 4 of Table 5.8 shows the results of a comparison based on the number of crop types brought to market by each household during the 12 months prior to the survey. Clearly there is a large effect among the horticulture participants, who sold an average of four different crop types during that year – but there is good evidence too that VSL members were bringing a wider variety of crops to market than were comparison households.

Finally, columns 5 and 6 of Table 5.8 show the differences between households in project and comparison communities in the total value of crops sold during the 12 months prior to the survey. It is clear that the value of crops sold was much higher among the horticulture participants than among the comparison households, but that also there is a significant positive effect among the sample of VSL members as well. The estimates of the differences in the logarithmic measure presented in column 6 can be interpreted as percentages: this implies that the



value of sales among VSL members overall was approximately double that among the matched comparison households, and among the horticulture participants was up to four times larger.

These results imply major increases in the revenue being generated by crop sales for households that have been supported by the project. It is important to note at this point that these figures for revenue do not take account of costs of production, nor of the opportunity cost of the producer's time. A full analysis of the project's effects on overall household income would require a more detailed survey to be carried out; but the following section will examine some indicators of household material wellbeing.

### 5.3.6 Indicators of material wellbeing

This section will examine whether there is any evidence that the project had an impact on indicators of material wellbeing. The four types of indicators collected in the survey were:

- Food security
- Dietary diversity
- Housing conditions, ownership of land, productive assets and household goods
- Children's school attendance.

Starting with food security, the questionnaire included a module based on the Household Food Insecurity Access Scale developed by USAID's Food and Nutrition Technical Assistance Project<sup>6</sup> and the 'reduced' version of the Coping Strategies Index.<sup>7</sup> Respondents were asked about their experience of food security during the previous lean season (roughly the period December to February), and specifically how often household members had experienced any of the following:

- Reduced the size of meals because there was not enough food.
- Had to eat fewer meals in a day than normal because there was not enough food.
- Reduced the amount eaten by adults so that children could eat.
- Had to borrow food or rely on help from a friend or relative because there was not enough food.
- Went to sleep at night hungry because there was not enough food.
- Went for a whole day and night without eating because there was not enough food.

Three quarters of women interviewed reported that their households had experienced at least one of these situations during the past lean season. A score was created for each household by adding the number of times they reported experiencing each food security problem, to give an overall score out of 18. The differences between households of VSL members and those in the comparison communities are shown in column 1 of Table 5.9. The estimate derived from the PSM kernel model shown in the table is not statistically significant, though those derived from alternative regression and PSM models are significant at the 10

*Standard indicators of food security and dietary diversity were included in the questionnaire.*

<sup>6</sup> [http://www.fantaproject.org/publications/hfias\\_intro.shtml](http://www.fantaproject.org/publications/hfias_intro.shtml)

<sup>7</sup> [http://www.fsnnetwork.org/sites/default/files/coping\\_strategies\\_tool.pdf](http://www.fsnnetwork.org/sites/default/files/coping_strategies_tool.pdf)

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per cent level: this provides some evidence of a difference between the two groups in terms of food security. The estimates derived for the horticulture participants are even larger, though only one of the regression models produces a result significant at the 10 per cent level.

An indicator of severe food security problems was also created. This indicator was defined to be positive if the respondent reported that a) some household member went to sleep hungry or went for a whole day and night without food at least occasionally during the December–February period; or b) some household member had to eat fewer meals than normal or borrow food from others at least four times per week at that time.

On this basis, a little more than half of households reported experiencing severe food insecurity during the past lean season. As shown in column 2 of Table 5.6, there is no significant difference in this proportion between the households of VSL members and those of comparison respondents.

Respondents were also asked about the *diversity* of food types eaten in their households: specifically, they were asked for the number of days during the past seven days on which the household had eaten each of 14 different food types. As an approximate indication of dietary diversity, each household was assigned a score based on the raw total of the number of days they had eaten each food types (so that the maximum possible score was 98). As can be seen in column 3 of Table 5.9, this score was estimated to be slightly higher among the households both of VSL members and of horticulture participants. As with the food security score, the PSM kernel results presented in the table are not statistically significant, but alternative PSM and regression models produce estimates that are significant at the 10 per cent level – again providing some (weak) evidence of a difference between the intervention and

*There was some indication that households of project participants experienced fewer food security problems during the previous lean season than did comparison households.*

**Table 5.9: Comparison of supported and comparison households in indicators of material wellbeing**

	1	2	3	4	5	6	7
	Food security score	Severe food insecurity (binary)	Dietary diversity score	Positive dietary diversity (binary)	Index of wealth indicators	Index of change in wealth indicators since 2009	Proportion of school-age children who attended school in the past month†
<b>Overall</b>							
<b>Unadjusted</b>							
Intervention group mean:	14.346	0.503	30.238	0.346	0.543	0.023	0.900
Comparison group mean:	13.183	0.597	27.371	0.236	-0.455	-0.114	0.915
Unadjusted difference:	1.163***	-0.094**	2.866***	0.110***	0.998***	0.137	-0.015
	(0.316)	(0.044)	(0.837)	(0.040)	(0.235)	(0.158)	(0.025)
<b>Observations:</b>	562	562	562	562	562	562	429
<b>PSM</b>							
Post-matching difference: (kernel)	0.529	-0.012	1.358	0.068	-0.046	0.204	0.003
	(0.398)	(0.064)	(1.162)	(0.058)	(0.369)	(0.216)	(0.043)
<b>Observations:</b>	547	547	547	547	547	547	417
<b>Horticulture participants</b>							
<b>PSM</b>							
Post-matching difference: (kernel)	0.974	-0.043	1.072	0.112	0.140	0.380	0.050
	(0.995)	(0.158)	(2.636)	(0.136)	(0.845)	(0.805)	(0.074)
<b>Observations:</b>	399	399	399	399	399	399	308

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

† Analysis carried out among households with at least one school-age child.

comparison groups. Again, the estimates for the effect on horticulture participants are positive and larger in size than those for the VSL members overall, but they are not statistically significant.

Column 4 of Table 5.9 shows the results for a binary indicator of positive dietary diversity, defined to be positive for households that had consumed:

- A source of protein (eggs, dairy products, pulses, meat or fish) on at least four of the past seven days; and
- Green leafy vegetables on at least three of the past seven days; and
- Other fruit or vegetables on at least three of the past seven days.

*The diversity of food types consumed in households of project participants may also have been slightly higher than among comparison households – though the evidence for this is not clear.*

Approximately 30 per cent of households scored positively on this indicator. There is little or no indication of a difference in this measure between the VSL members or horticulture participants and the comparison households.

The next indicator used to assess the project's effects on household wellbeing is an aggregate of indicators of material wealth. In the survey, data were collected on the household's ownership of various assets (including livestock, productive assets, agricultural tools and households goods), as well as on the condition of the family's house. The respondent was first asked to provide details about various items currently owned by their household (e.g. number of radios or the material of their roof), and were then asked to recall this information for their situation in 2009. After examining the data on each wealth indicator and for each time period, scores of zero, one or two points were allocated.

Given that the various wealth indicators are intended to measure household wealth status, they should be correlated with one another. That is, a household that scores favourably on one particular wealth indicator should be more likely to do so for other wealth indicators as well. In other words, these indicators should have a high degree of inter-item correlation. Cronbach's alpha is a measure of this interterm correlation.<sup>8</sup> After removing two items for which ownership was negatively correlated with the others, the Cronbach's alpha obtained for the 41 indicators was 0.87, based on the data as of the date of the survey, and 0.86 from the recalled baseline data. These high values for Cronbach's alpha demonstrate that the resulting set of wealth indicators are highly correlated with each other.

Principal component analysis (PCA) was then to generate an index from this list of indicators, for 2009 as well as for the date of the survey. PCA is a data reduction technique that was used to narrow 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 index score is

<sup>8</sup> When items are used in a scale or index, they should all measure the same underlying latent construct (e.g. household wealth status). The items, then, must be significantly correlated with one another. The more the variables are correlated, the greater is the sum of the common variation they share. If all items are perfectly correlated, alpha would be 1 and 0 if they all were independent from one another. For comparing groups, an alpha of 0.7 or 0.8 is considered satisfactory. See: Bland, M. J. and Altman, D. G. (1997) 'Statistics notes: Cronbach's alpha.' *BMJ* 314: 572.

determined by both a) the number of assets it owns, and b) the particular weight assigned to each asset. This enables the relative wealth status of the households to be compared. (The index created for 2009 was the one used to consider compare the economic situation of the supported and comparison households at baseline in Section 5.1, and used in the PSM and regression models through this report to control for differences in baseline wealth status.)

The comparison of wealth indices for households in the project and comparison districts are shown in columns 5 and 6 of Table 5.9. These results provide no clear indication of a significant difference between the households of VSL members or horticulture participants and those of comparison respondents. While the estimates for the difference-in-difference measure derived by the different PSM and regression models are uniformly positive, they are far from being statistically significant.

Finally in this section, survey respondents were also asked about the school attendance of children in their households. Approximately three quarters of respondents surveyed had at least one school-age child living in their household – defined for the purposes of this survey as being aged between six and 16 years. School attendance was reported to be nearly universal: 85 per cent of households had sent all of their school-age children to school in the last four weeks. Column 7 of Table 5.9 shows that there was no difference between the supported and comparison households in terms of the proportion attending school.

*There was no significant difference between households in the project and comparison communities in terms of the index of wealth indicators, or the change in that index since 2009.*

In summary, then, there is some weak evidence that households of VSL members and horticulture beneficiaries experienced fewer food security problems during the last lean season, and were eating a slightly more diverse diet at the time of the survey. However, it will be recalled from Section 5.1 that the VSL members and horticulture participants were significantly more wealthy than the comparison respondents in 2009 (according to the recalled baseline data). While the various statistical models control for these baseline differences to some extent, it seems likely that the observed differences in food security and food diversity may be consequences of the baseline differences rather than of outcomes of the project activities. In terms of the wealth index, where we can use the recalled baseline data to derive a (more robust) difference-in-difference measure, it is not clear that there are any systematic differences between the supported and comparison households.

From the bottom row of Table 5.9, it can be seen that the estimated effects on the horticulture participants interviewed are generally similar in size to those on the overall sample of VSL group members. Although these estimates are not statistically significant, it seems natural to conclude that the impact on the horticulture participants is similar to the VSL group members. This implies that there is (as yet) little or no impact on overall household wellbeing from the horticulture activities, on top of the benefits received from participation in the VSL groups. Since most of these individuals have been supported by the horticulture component of the project only since 2011 (and some of them since 2012, less than a year prior to the survey), it is possible that they are still at a stage of investing any available resources in these activities, so have not yet had time to make significant improvements in their living conditions.

It should be recalled that a number of the women interviewed as members of the VSL groups had also received support as members of the piggery groups established under this project. Although the number of piggery group participants was smaller than expected (meaning that it may be unlikely that statistically significant effects could be detected), it is nevertheless of interest to check for any evidence of differential impact on the various indicators of household wellbeing.

To that end, Table 5.10 shows the results of regression models for the same outcomes as those shown in Table 5.9. These models are created using the sample of VSL members and the corresponding comparison respondents, but with a dummy variable added to identify those 17 respondents that also participated in the piggery groups. The coefficient on the dummy variable (in the second column of the table) shows the differential effect of the piggery activities, on top of participation in the VSL group activities. The results provide some evidence that food security outcomes are actually worse among the piggery participants than among the VSL members in general – though these results are only statistically significant at the 10 per cent level, meaning that this evidence is weak. There is no evidence of a differential impact on the other outcomes examined in this table.

**Table 5.10: Results of regression models for indicators of household wellbeing, after adding a dummy variable for participation in the piggery component of the project**

	Coefficient on variable for participation in VSL groups	Coefficient on variable for participation in piggery component
Food security score	0.790** (0.367)	-1.519* (0.805)
Severe food insecurity	-0.060 (0.056)	0.213* (0.121)
Dietary diversity score	1.657 (1.051)	0.610 (2.124)
Positive dietary diversity	0.015 (0.052)	0.056 (0.117)
Index of wealth indicators	0.197 (0.144)	-0.304 (0.322)
Change in index of wealth indicators since 2009	0.271 (0.204)	-0.596 (0.452)
Proportion of school-age children who attended school in the past month†	0.006 (0.037)	-0.092 (0.106)

Standard errors in parentheses

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

Coefficients for covariates not presented. Probit regression used for binary outcomes.

† Analysis carried out among households with at least one school-age child.

### **5.3.7 Index of women's empowerment**

In order to assess a multi-dimensional concept such as women's empowerment, Oxfam GB has adopted and adapted an approach that assesses several dimensions of women's empowerment. This approach builds on the 'Women's Empowerment in Agriculture Index'<sup>9</sup> (WEAI) developed by the Oxford Poverty and Human Development Initiative with support from the United States Agency for International Development (USAID) and the International Food Policy Research Institute (IFPRI).

<sup>9</sup> <http://www.ifpri.org/publication/womens-empowerment-agriculture-index>

Using the WEAI approach, the index used in this Effectiveness Review assesses **five dimensions of women’s empowerment**. The dimensions relate to women’s involvement in household decision-making, access to and control over resources, public engagement and self-perception. Several indicators were identified under each of these five dimensions (see Table 5.11).

The indicators within each of the dimensions are based on the following definitions:

- **Ability to make and influence decisions:** Involvement in household decisions related to production, use of income and other domestic activities, as well as influence on decision-making at a community level.
- **Self-perception:** Opinions on women’s rights and women’s economic and domestic roles; self-confidence and psycho-social wellbeing.
- **Personal freedom:** Autonomy in work and personal life, literacy, attitudes towards and experience of violence.
- **Access to and control over resources:** Access to an independent income, savings and credit; access to and decision-making power over productive resources such as land, property, livestock and other assets.
- **Support from social networks:** Extent of social connections within the community.

**Table 5.11: Dimensions and characteristics of women’s empowerment used in the index**

<b>Dimension</b>	<b>Characteristic</b>
Ability to make or influence decisions	Involvement in decisions on productive activities
	Involvement in household spending decisions
	Involvement in household-management decisions
Self-perception	Influence in community decision-making
	Attitude towards women’s economic roles
	Attitude towards women’s domestic roles
	Opinion on women’s rights
	Self-efficacy
Personal freedom	Psycho-social wellbeing
	Personal autonomy
	Opinion on gender-based violence
Access to and control over resources	Experience of violence
	Independent income
	Role in managing household’s cash
	Personal savings
	Ownership or control of strategic assets
Support from social networks	Access to credit
	Participation in community groups
	Social connectivity

The questionnaire used in the Effectiveness Review included questions relating to each of the characteristics listed in Table 5.11. For each characteristic, a benchmark was defined based on what it means for a women to be faring reasonably well in relation to the characteristic in question. The particular benchmarks used for each characteristic are described in the sections that follow, and are presented in summary form in Appendix 1. There is inevitably a degree of arbitrariness in defining such cut-offs. However, the results presented in subsequent sections also include some complementary measures, which act as a

check on the robustness of the results obtained from applying the cut-offs.

Aggregate measures of women's empowerment were then constructed using a multidimensional measurement methodology known as the Alkire-Foster method.<sup>10</sup> Firstly (and mostly simply), a 'base empowerment index' is defined as the proportion of characteristics of empowerment in which each interviewed woman scores positively. The second measure to be used is to define an overall binary cut-off for the entire index, with the women above this cut-off considered to be empowered. For the purposes of measuring women's empowerment under the Global Performance Framework, a woman is defined as empowered if she scores positively on at least two thirds of the characteristics. Using this definition, the 'Alkire-Foster empowerment index' is defined to take a value of one (the maximum) for any woman who scores positively on at least two thirds of the characteristics of empowerment, and otherwise is equal to the proportion of characteristics in which she scores positively, up to that benchmark.

*The results for the 19 different characteristics of women's empowerment were aggregated to produce four different measures of overall empowerment.*

Finally, the Oxfam GB global indicator for empowerment is based on whether each woman interviewed is doing better in terms of overall empowerment than a 'typical' woman in the area. This is defined by comparing the base empowerment index for each woman with the median of the comparison group. The global indicator takes the value of 1 if the base empowerment index is greater than the median of the comparison group, and zero otherwise.

In summary, the four key measures of overall resilience analysed are:

- The **base empowerment index**: the proportion of characteristics of empowerment for which each woman scores positively.
- The proportion of respondents who meet the **overall benchmark for empowerment**, scoring positively in at least two thirds of the characteristics.
- The **Alkire-Foster (AF) empowerment index**: whether the woman reaches the benchmark in at least two-thirds of the characteristics, and otherwise is equal to the proportion of characteristics for which she does reach the benchmark.
- The Oxfam GB **global indicator**, based on whether the base empowerment index is greater than the median of the comparison group or not.

The first column of Table 5.12 shows the difference between women in project communities and women in comparison communities in terms of the base empowerment index. It can be seen, in column 1, that respondents scored positively on just over half of the characteristics of empowerment. This figure is significantly higher among the VSL members than among the comparison respondents.

Column 2 of Table 5.12 shows the proportions of women who reach the benchmark for overall empowerment. Nearly a quarter of the women interviewed were considered to be empowered overall, with this difference being approximately 15 percentage points higher among the

<sup>10</sup> Sabina Alkire and James Foster, 'Counting and multidimensional poverty measurement', *Journal of Public Economics* vol. 95 (2011), pp. 476-487: <http://www.sciencedirect.com/science/article/pii/S0047272710001660>

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women in VSL groups than among the corresponding comparison respondents. The AF index, for which the results are shown in column 3 of the table, combines the information from the base resilience index and the indicator for those considered to be empowered overall: again, there is a clear difference between the VSL members and comparison respondents in the average scores on this index.

Finally, column 4 of Table 5.12 shows the differences between women in the project and comparison communities in terms of the Oxfam GB global indicator for women’s empowerment: the proportion who have empowerment scores higher than the median in the comparison group.

**Table 5.12: Comparison of supported and comparison women in terms of access to credit**

	1	2	3	4
	Base empowerment index	Respondent reaches overall benchmark for empowerment (binary)	Alkire-Foster empowerment index	Base empowerment index above median of comparison group (global outcome indicator - binary)
<b>Sample of VSL members</b>				
<i>Unadjusted</i>				
Intervention group mean:	0.588	0.357	0.842	0.605
Comparison group mean:	0.505	0.162	0.742	0.416
Unadjusted difference:	0.083***	0.195***	0.099***	0.189***
	(0.014)	(0.037)	(0.019)	(0.044)
<b>Observations:</b>	562	562	562	562
<i>PSM</i>				
Post-matching difference: (kernel)	0.064***	0.149***	0.073***	0.098*
	(0.019)	(0.054)	(0.024)	(0.058)
<b>Observations:</b>	547	547	547	547
<b>Horticulture participants</b>				
<i>PSM</i>				
Post-matching difference: (kernel)	-0.029	-0.018	-0.042	-0.101
	(0.046)	(0.101)	(0.057)	(0.147)
<b>Observations:</b>	399	399	399	399

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

Given the non-experimental nature of the data, it is of interest to explore how much unobserved bias would be needed to ‘explain away’ the positive effect estimates. In other words, how sensitive are the effect estimates to the possible presence of unobserved bias in favour of the intervention population?

Sensitivity analysis is an approach used for exploring this. It was implemented – for the comparison of VSL members against comparison respondents – using Rosenbaum sensitivity analysis with Stata’s *rbounds* command. Here, unobserved bias is assumed to exist in favour of the intervention population at different log odds ratios. How large can the log odds ratio be in order to render an effect estimate non-significant? Table 5.13 presents the results that were obtained from undertaking such analysis with the nearest-neighbour one-to-one matching effect estimate for the AF empowerment index. The table reveals that unobserved bias would need to be present at a log odds ratio of 1.4 in favour of the intervention population in order for the effect estimate to be rendered statistically insignificant with a 95 percent level of confidence. This implies that the effect estimate is not particularly robust to the possible existence of omitted variable bias.



**Table 5.13: Results of Rosenbaum sensitivity analysis for base empowerment index and VSL members, where unobserved, positive bias is assumed to exist a various log odds ratios among the intervention population**

Log Odds Ratio of Hidden Bias	p-value of effect estimate with bias	Estimated effect estimate with bias	95% confidence level – two tailed	
			CI+	CI-
1	0.000833	0.052631	0.026316	0.105263
1.1	0.004177	0.052631	0.026316	0.105263
1.2	0.014625	0.052631	0.000000	0.131579
1.3	0.038943	0.026316	0.000000	0.131579
1.4	0.083868	0.026316	0.000000	0.131579
1.5	0.152887	0.026316	-0.026316	0.157895
1.6	0.244215	0.000000	-0.026316	0.157895
1.7	0.351142	0.000000	-0.026316	0.157895
1.8	0.464241	0.000000	-0.052631	0.157895
1.9	0.574107	0.000000	-0.052631	0.184210
2	0.673416	0.000000	-0.052631	0.184210

### 5.3.8 Dimension 1: Ability to make and influence decisions

The first dimension of women’s empowerment considered in the Effectiveness Review focused on women’s influence in decision-making, both at household and at community level. Results for the overall index of women’s empowerment and for each of the individual characteristics are shown in Table 5.14.

It can be seen from column 1 of Table 5.14 that respondents scored positively on average on approximately three quarters of the characteristics of household decision-making. There is no evidence of any difference in this figure between the members of the VSL groups or the horticulture participants and the comparison respondents.

Columns 2 to 5 of Table 5.14 show the results of analysis of the individual characteristics underlying the index reported in column 1. The results on women’s involvement in household decision-making are based on questions from the survey in which respondents were asked who in their household is normally responsible for each of 15 different types of decisions. If the respondent stated that she was not the sole decision-maker in any particular area, she was also asked to what extent she would be able to influence a decision she disagreed with.

The 15 different types of decision were divided into the following three areas:

- **Decisions on productive activities:** Decisions relating to agricultural activities, livestock rearing, and other income-generating activities.
- **Spending decisions:** How income gained from each of the household’s income-generating activities is spent.
- **Household-management decisions:** Decisions over respondent’s travel, children’s education, what to do when a household members falls sick, and what to give as gifts during festivals.

In each of these three areas, a woman was considered to score positively if she said that she was either the main decision-maker or had a large amount of influence over at least half of the types of decisions made in the household. As shown in columns 2 to 4 of Table 5.14, respondents generally had positive involvement in household decision-

*The project participants did not differ from the comparison respondents in terms of their reported involvement in household decision-making.*

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making, with at least three quarters of them scoring positively in each of the three decision-making areas. There are no indications that these proportions differed significantly between the VSL members or horticulture participants and the comparison respondents.

**Table 5.14: Comparison of women in project and comparison communities in terms of characteristics of ability to make and influence decisions**

	1	2	3	4	5
	Index of ability to make and influence decisions	Involvement in decisions on productive activities (binary)	Involvement in spending decisions (binary)	Involvement in household-management decisions (binary)	Influence in community decision-making (binary)
<b>Sample of VSL members</b>					
<i>Unadjusted</i>					
Intervention group mean:	0.792	0.795	0.730	0.849	0.795
Comparison group mean:	0.757	0.751	0.716	0.830	0.732
Unadjusted difference:	0.035	0.044	0.014	0.018	0.062
	(0.027)	(0.038)	(0.040)	(0.033)	(0.039)
<b>Observations:</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>562</b>
<i>PSM</i>					
Post-matching difference: (kernel)	0.006	0.032	-0.033	-0.028	0.053
	(0.033)	(0.050)	(0.052)	(0.039)	(0.047)
<b>Observations:</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>547</b>
<b>Horticulture participants</b>					
<i>PSM</i>					
Post-matching difference: (kernel)	-0.092	-0.074	-0.141	-0.083	-0.070
	(0.100)	(0.145)	(0.151)	(0.131)	(0.118)
<b>Observations:</b>	<b>399</b>	<b>399</b>	<b>399</b>	<b>399</b>	<b>399</b>

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

To evaluate women's influence on decision-making at community level, respondents were presented with the following seven statements:<sup>11</sup>

- More women are now holding positions in development committees than before.
- If you wanted to voice your opinion in community meetings, people would allow you to do so.
- Women are represented in all the important committees in this community.
- Community leaders now take the opinions of women into account more than they used to.
- Women are able to influence the important decisions which are taken in this community.
- Women are just as good as men in making decisions in community development committees.
- Women have become more active in decision making in this community in the last few years.

Respondents were asked for the extent to which they agreed or disagreed with each of these statements on a four point scale: 'strongly agree', 'partly agree', 'partly disagree' or 'strongly disagree'. A woman was deemed to have scored positively on community influencing if she strongly agreed with at least six of the seven statements. As with household decision-making, the majority of respondents (76 per cent)

<sup>11</sup> The responses from one further statement were found not to be positively correlated with the other four, so this statement was excluded from the analysis.

met this criterion, and there are no indications of any difference between the supported and comparison respondents.

### 5.3.9 Dimension 2: Self-perception

The 'self-perception' dimension includes an assessment of respondents' attitudes and opinions towards women's rights and traditional economic and domestic roles, as well as measures of self-confidence and 'psycho-social' wellbeing. Table 5.15 shows the results of the comparison between women in project and comparison communities in terms of the overall index and the individual characteristics. As can be seen in column 1, VSL members scored higher overall than women in comparison communities. Although this difference is seen to be statistically significant at the 10 per cent level under the PSM kernel model, this is not corroborated by the various regression models tested. For this reason, it cannot be stated with confidence that there is a systematic difference in this measure between the two groups of women. Conversely, while the PSM model produces an estimate of a *negative* and statistically significant difference between the horticulture participants and corresponding comparison women, the regression models do not produce statistically significant estimates.

Each of the characteristics under this dimension was assessed, like that for community influencing discussed in the previous section, by presenting various statements to the respondents, and asking them about the extent to which they agreed or disagreed with each.

**Table 5.15: Comparison of women in project and comparison districts in terms of characteristics of self-perception**

	1	2	3	4	5	6
	Index of ability self-perception	Attitude towards women's economic roles (binary)	Attitude towards women's domestic roles (binary)	Opinion on women's rights (binary)	Self-efficacy (binary)	Psycho-social wellbeing (binary)
<b>Sample of VSL members</b>						
<i>Unadjusted</i>						
Intervention group mean:	0.512	0.524	0.286	0.519	0.692	0.541
Comparison group mean:	0.444	0.390	0.178	0.416	0.695	0.538
Unadjusted difference:	0.069*** (0.023)	0.134*** (0.044)	0.109*** (0.037)	0.102** (0.045)	-0.003 (0.041)	0.002 (0.045)
<b>Observations:</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>562</b>	<b>562</b>
<i>PSM</i>						
Post-matching difference: (kernel)	0.053* (0.029)	0.152** (0.059)	0.093* (0.050)	0.049 (0.062)	-0.071 (0.053)	0.044 (0.063)
<b>Observations:</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>547</b>	<b>547</b>
<b>Horticulture participants</b>						
<i>PSM</i>						
Post-matching difference: (kernel)	-0.130* (0.076)	-0.098 (0.154)	-0.109 (0.148)	-0.221* (0.125)	-0.046 (0.118)	-0.178 (0.157)
<b>Observations:</b>	<b>399</b>	<b>399</b>	<b>399</b>	<b>399</b>	<b>399</b>	<b>399</b>

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

Firstly, a respondent's **attitude towards women's economic roles** was assessed by examining her agreement or disagreement with the

following statements:<sup>12</sup>

- Wives should be more concerned with their duties of childbearing and housework, and leave earning income to men.
- A man's job is to earn money; a woman's job is to look after the home and family.
- A man should provide his wife with everything she needs, even if she is able to earn income for herself.

Each respondent was deemed to score positively on this characteristic if she disagreed with at least two or these three statements. There is some reasonably strong evidence of a difference between VSL members and women in project communities in terms of this characteristic: the PSM models estimate that there is a difference of 15 percentage points in the proportions scoring positively, and that this difference is significant at the 5 per cent level; the regression models produce smaller estimates that are statistically significant at the 10 per cent level. However, there is no indication of such a difference between horticulture participants and comparison respondents.

Four statements included in the survey were intended to elicit respondents' **opinions on women's domestic roles**:<sup>13</sup>

- A wife should never question the decisions made by her husband.
- A man should have the final word about decisions in the home.
- A husband, rather than his wife, should be the overall boss of the home.
- A wife should obey her husband, even if she disagrees with him.

Each respondent was woman was deemed to have scored positively on this indicator if she disagreed with at least three of these four statements. Again, there is evidence, at least at the 10 per cent significance level, of a difference between VSL members and comparison respondents in this regard.

A further three statements were used to assess each respondent's **opinions on gender rights**.

- If a young girl objects to getting married, her parents should not listen to her, and should go ahead with the marriage anyway.
- A good marriage is more important for a girl than a good education.
- Men are better suited than women for making decisions in development meetings.

Each respondent scored positively on this characteristic if she disagreed with each of these three statements. Forty-five per cent of respondents met this criterion. Although the proportion was estimated to be higher among VSL members than among women in comparison communities, this difference was not statistically significant under any of the PSM or regression approaches tested.

Respondents' **self-confidence** was assessed by means of three questions derived from the General Self-Efficacy Scale:<sup>14</sup>

- If you are in trouble, you can usually think of a solution.

*There is some evidence that the VSL members expressed more positive attitudes towards women's economic roles and domestic roles than the comparison respondents.*

<sup>12</sup> Responses to another three statements were either negatively correlated or poorly correlated with these three, so were excluded from the analysis.

<sup>13</sup> Again the responses to one statement were excluded from the analysis because of negative correlation with the other four.

<sup>14</sup> See <http://userpage.fu-berlin.de/~health/selfscal.htm>

- When you are confronted with a problem, you can usually find several solutions.
- You can always manage to solve difficult problems if you try hard enough.

For this indicator, a respondent was considered to have scored positively if she agreed strongly with each of these three statements. Approximately two thirds of respondents scored positively, but again there was no indication of a difference between women interviewed in the project and comparison communities.

*Attitudes to gender rights, self-confidence and psycho-social health did not differ between project participants and comparison respondents.*

Finally under this dimension, another section of the questionnaire asked respondents about their **psycho-social health** – specifically whether they had experienced any of the following during the past two weeks:<sup>15</sup>

- Lost much sleep over problems
- Felt you couldn't overcome your difficulties.
- Been feeling unhappy and depressed
- Lost confidence in yourself
- Been feeling reasonably happy overall.

Respondents were scored positively if they did not respond 'yes, often' to experiencing any of the problems listed, did not respond 'no' to feeling happy overall, and only responded 'sometimes' to one or two of the problems. Just over half of women interviewed scored positively, but again with no indication of a difference between those in the project and comparison communities.

### 5.3.10 Dimension 3: Personal freedom

The survey included questions relating to three characteristics of personal freedom. Again, Table 5.16 shows the results of the comparison of women in project and comparison communities in terms of the index and each of the individual characteristics. Surprisingly, women interviewed in the project communities – including both the sample of VSL members and the horticulture participants – scored significantly worse on this dimension than did women in the comparison communities.

The first characteristic considered under this dimension is the degree of **autonomy** the respondent has in her life and work. The indicator was again constructed by presenting three statements, and asking whether each of these was true for her:<sup>16</sup>

- You are the one who decides what work to do and when to do it.
- If you wanted to participate in a group in the community, you would not have to seek permission from anyone.
- You can go to the maize mill without asking permission.

Each respondent was scored positively on this characteristic if she agreed strongly with each of these statements. This applied to approximately 40 per cent of respondents, a proportion that did not differ significantly between project and comparison communities.

<sup>15</sup> Again, other items were asked in the survey, but were found to have negative correlation or low correlation with the others. Cronbach's alpha for the resulting measure is 0.72.

<sup>16</sup> Once again, responses to another three statements included in the survey were excluded from the analysis for this characteristic, because responses were found to be negatively correlated with the other three.

**Table 5.16: Comparison of women in project and comparison communities in terms of characteristics of person freedom**

	1 Index of personal freedom	2 Personal autonomy (binary)	3 Attitudes to violence against women (binary)	4 Experience of violence (binary)
<b>Sample of VSL members</b>				
<i>Unadjusted</i>				
Intervention group mean:	0.449	0.411	0.535	0.400
Comparison group mean:	0.523	0.408	0.626	0.533
Unadjusted difference:	-0.074*** (0.028)	0.002 (0.044)	-0.091** (0.044)	-0.133*** (0.045)
<b>Observations:</b>	562	562	562	562
<i>PSM</i>				
Post-matching difference: (kernel)	-0.064* (0.038)	-0.011 (0.060)	-0.118** (0.060)	-0.063 (0.063)
<b>Observations:</b>	547	547	547	547
<b>Horticulture participants</b>				
<i>PSM</i>				
Post-matching difference: (kernel)	-0.199* (0.104)	-0.222* (0.133)	-0.190 (0.148)	-0.186 (0.145)
<b>Observations:</b>	399	399	399	399

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

However, a significantly lower proportion (around a quarter) of the horticulture participants scored positively, a difference that is statistically significant at the 10 per cent level.

Respondents were also asked for their **opinion on the acceptability of violence against women**, as well as on their actual **experience of violence** in the 12 months prior to the survey. Firstly, women were asked whether they believed it is acceptable for a man to hit his wife, in various situations. Overall, 40 per cent of respondents said that there are some situations in which this is acceptable; the most commonly cited situations in which violence against a wife was said to be acceptable were if she disobeys her husband or if he suspects her of having been unfaithful. In both of these respects, larger proportions of VSL members said that violence would be acceptable than did women in comparison communities – producing the negative and statistically significant difference shown in column 3 of Table 5.16.

To investigate the prevalence of violence against women in these communities, respondents were not asked directly about whether they had suffered violence themselves. Instead, they were asked whether any ‘woman close to them’ had suffered from any of various forms of violence during the past 12 months. These were simple yes/no questions: no further details about the frequency of the incidents or the identity of the victims or perpetrators were requested. Half of the women interviewed reported at least some cases of violence against women close to them. The most common incidents mentioned were being subjected to insults or humiliation (reported by a third of women) and actually being hit (again reported by a third). One in seven respondents said that there had been cases where serious physical harm had been inflicted to a woman known to them, and one in eight mentioned cases of rape.

Worryingly, the proportions of women who reported each type of violent

*Surprisingly, the project participants were more likely to say that a man’s use of violence against his wife can sometimes be justified – and also reported greater incidence of violence against women in their communities.*

incidents were higher among VSL members and horticulture participants than among comparison respondents. Although the difference for the overall characteristic is (as shown in column 4 of Table 5.16) not statistically significant, this is still a worrying pattern.

It does not seem likely that the project activities could have resulted in both an increase in violence and an increase in the acceptability of violence against women among women themselves. An explanation is that participants in the project activities were more willing to report incidents of violence in the course of the survey than were women in the comparison districts. Since this Effectiveness Review has found that project participants – at least the sample of VSL members – scored more positively on other characteristics of empowerment than did those in the comparison districts, it is possible that they also felt more confident in discussing violence against women with outsiders. In-depth follow-up research would be required to make a judgement about whether this is the right conclusion to draw.

### 5.3.11 Dimension 4: Access to and control over resources

A further five characteristics were identified and measured corresponding to women's access to and control over resources. The comparisons between women in project and comparison communities for the characteristics making up this dimension are shown in Table 5.17. For the index constructed from the five characteristics, it is clear that both VSL members and horticulture participants score positively on significantly more of the characteristics than do women in comparison communities. This is to be expected, given that some of these characteristics are directly related to the project's main activities.

*Access to credit and savings behaviour were clearly higher among project participants, as was women's role in household cash management.*

The existence of **personal savings** is one characteristic that may indicate whether a woman has some degree of autonomy in accessing financial resources. As has already been seen in Section 5.3.1, members of the VSL groups reported having considerably larger savings reserves than did women in comparison communities. To derive the indicator of the characteristics considered in column 2 of Table 5.17, respondents were scored positively if they estimated that their savings would allow their household to live for at least two weeks in an emergency. As can be seen, 41 per cent of the VSL members met this criterion, against only 12 per cent of women in comparison communities.

The second characteristic considered under this dimension is women's **access to credit**. The detailed results on households' borrowing behaviour and on women's involvement have already been discussed in Section 5.3.2. In considering the contribution of access to credit to women's empowerment, respondents were considered to score positively if both a) their household had taken some loan during the past 12 months and b) that the respondent herself was the main decision maker in borrowing from at least one source. As would be expected from the results of Section 5.3.2, and can be seen in column 2 of Table 5.17, there are large differences between the women in project and comparison districts in this regard.

Whether a woman has **access to some independent income** was another characteristic considered in this dimension. Based on the same

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survey questions discussed in Section 5.3.3, each respondent was considered to score positively if she estimated that she contributed more than a third of household resources or income. The majority of women met this criterion, but there is no evidence that this differed between the VSL members and comparison respondents. However, the estimates of the difference between horticulture participants and those in comparison communities are closer to being statistically significant (some of the models produce a result significant at the 10 per cent level).

**Table 5.17: Comparison of women in project and comparison communities in terms of characteristics of access to and control over resources**

	1	2	3	4	5	6
	Index of access to and control over resources	Personal savings (binary)	Access to credit (binary)	Independent income (binary)	Role in household cash management (binary)	Control over assets (binary)
<b>Sample of VSL members</b>						
<i>Unadjusted</i>						
Intervention group mean:	0.594	0.411	0.659	0.751	0.719	0.427
Comparison group mean:	0.395	0.122	0.199	0.695	0.586	0.371
Unadjusted difference:	0.199*** (0.022)	0.289*** (0.035)	0.461*** (0.038)	0.056 (0.041)	0.133*** (0.043)	0.056 (0.044)
<b>Observations:</b>	562	562	562	562	562	562
<i>PSM</i>						
Post-matching difference: (kernel)	0.185*** (0.029)	0.296*** (0.048)	0.438*** (0.055)	0.050 (0.059)	0.138** (0.058)	0.004 (0.058)
<b>Observations:</b>	547	547	547	547	547	547
<b>Horticulture participants</b>						
<i>PSM</i>						
Post-matching difference: (kernel)	0.165** (0.074)	0.177 (0.132)	0.378*** (0.140)	0.224 (0.140)	-0.030 (0.154)	0.078 (0.151)
<b>Observations:</b>	399	399	399	399	399	399

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

*Project participants were no more likely than comparison respondents to have ownership or decision-making control over important assets.*

Respondents were also asked who in their household plays the main role in **keeping and managing the family's cash**. The majority of respondents responded that they personally take on this role: a proportion that was significantly higher among members of the VSL groups than among women in comparison communities.

The final characteristic considered under this dimension was the woman's **ownership or control of assets**. For each of the types of livestock, land, property, or major productive equipment owned by their household, respondents were asked which household members have control over that asset – meaning who would make the decisions to sell or dispose of the asset if necessary. Just under 40 per cent of respondents reported that they have at least joint decision-making control over at least three types of important assets. This figure did not differ significantly between project and comparison communities.



**5.3.12 Dimension 5: Support from social networks**

The final two characteristics included in the Effectiveness Review attempted to evaluate the strength of respondents’ social networks. The results of the comparison for women in project and comparison communities in terms of these characteristics are shown in Table 5.18.

**Table 5.18: Comparison of women in project and comparison communities in terms of characteristics of support from social networks**

	1 Index of support from social networks	2 Social connections (binary)	3 Group participation (binary)
<b>Sample of VSL members</b>			
<i>Unadjusted</i>			
Intervention group mean:	0.565	0.595	0.535
Comparison group mean:	0.402	0.531	0.273
Unadjusted difference:	0.163*** (0.031)	0.064 (0.045)	0.262*** (0.042)
<b>Observations:</b>	562	562	562
<i>PSM</i>			
Post-matching difference: (kernel)	0.095** (0.043)	0.043 (0.061)	0.146** (0.058)
<b>Observations:</b>	547	547	547
<b>Horticulture participants</b>			
<i>PSM</i>			
Post-matching difference: (kernel)	0.124 (0.081)	-0.027 (0.137)	0.274* (0.153)
<b>Observations:</b>	399	399	399

Standard errors in parentheses

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

PSM estimates bootstrapped 1000 repetitions.

The first characteristic attempted to evaluate each woman’s degree of social connectivity by presenting two further statements and asking respondents the extent to which these apply to them:

- You would be able to ask others in the community for advice or support if you needed it.
- Other people in the community often ask you for advice or support when they need it.

Each respondent was scored positively on this indicator if she agreed strongly with both of these statements. This applied to just over half of respondents, but the proportion did not appear to be any higher among women interviewed in project communities than those interviewed in comparison communities.

Respondents were also asked which **community groups they participate in**, such as agricultural cooperatives, parent/teachers associations, water committees or village or area development committees. Respondents were considered to have scored positively if they reported participating in at least three types of community group, and to be involved to at least a medium extent in at least one of them. This applied to 54 per cent of the VSL members (and to an even larger proportion of the horticulture participants), but to only 27 per cent of women in comparison communities. Examining the underlying data shows that this difference in group participation is accounted for almost completely by women’s involvement in the VSL groups and the piggery units: women in the project communities do not participate significantly

*Involvement in community groups was higher among project participants: this directly reflects women’s participation in the VSL groups and other groups established under the project.*

more in other types of groups that were not established under this project.

## **6 Conclusions and learning considerations**

### **6.1 Conclusions**

This Effectiveness Review provides clear evidence that the establishment of village savings and loans (VSL) groups has been successful in encouraging their members to make regular savings, as well as providing a source of credit to people who have few other options for borrowing. The VSL members were more likely to state that they had used their loans to make productive investments than were women in comparison communities who had borrowed from other sources. Corroboration for this is provided by the observations that many VSL members have taken up petty commerce since the establishment of the VSL groups, and that VSL members' households reported applying more fertiliser to their crops in the past year than did those in comparison communities. (On the other hand, it is not clear that this additional fertiliser led to improved yields among these households.)

Those who have participated in the horticulture component of the project were almost all engaged in production of tomatoes and other vegetables, and had adopted the various improved agricultural techniques encouraged under the project. The total revenue generated from crop sales by the horticulture participants is up to four times greater than that generated by households in comparison communities who were (as far as it is possible to determine) at a similar level at baseline in 2009. The VSL members overall also sold crops of a total value approximately double that among the comparison households. However, it should be noted that these figures for revenue generated from sales do not take account of costs of production, or of other activities that may have been displaced if households have spent more of their time on production of commercial crops.

The next step was to consider whether there was any impact discernable on indicators of households' material wellbeing. The results provided some indication that households of VSL members and horticulture beneficiaries experienced fewer food security problems during the last lean season, and were eating a slightly more diverse diet at the time of the survey – but the evidence for these differences is quite weak, especially in the light of the baseline differences in wealth indicators between households interviewed in the project and comparison communities. The index of wealth indicators (such as housing conditions and ownership of livestock and assets) does not provide any evidence of a relative increase in material wellbeing among those who were supported by the project. It is therefore not clear that the project activities have yet led to a significant increase in household income or wellbeing.

Members of the VSL groups were found to score positively on more of the characteristics of women's empowerment than did women interviewed in comparison communities. In particular, they expressed more positive attitudes towards women's domestic and economic roles, as well as having a more positive position with regard to the direct project interventions (savings, access to credit, role in cash

management, and participation in community groups). Again, the fact that there were various differences between the women interviewed in project and comparison communities in terms of their (recalled) baseline data means that caution should be used in attributing all of these differences in women's empowerment to the project activities.

## **6.2 Programme learning considerations**

- **Seek to understand further the reasons that participation in the VSL groups, as well as the horticulture and piggery activities, had not resulted in significant effects on food security or wealth indicators – and how this relates to women's position in household decision-making.**

The project activities have clearly had very positive impacts on savings behaviour and the availability of credit, but this did not appear to have resulted in clear increases in food security or wealth indicators by the time of the survey. It is recognised that the size of loans available from the VSL groups is modest, but they do appear to have been enough to produce significant increases in agricultural investment. One possible explanation is that there is a tension between making productive investments and use of funds for immediate needs. In supporting further interventions of this kind, it will be important to examine in more detail whether this is a tension that is felt by households, how it is resolved, and how this relates to women's involvement in household decision-making. This could be particularly important given that nearly a third of VSL members reported that their husbands were the main decision-makers with regard to borrowing from the group.

- **Carefully monitor the potential for women's economic empowerment activities to increase the incidence of violence against women.**

It is concerning that the women in the project area were more likely than those in the comparison area to say that violence against women could be justified in some circumstances. There are also indications that they were more likely to say that they had been subject to violence – though these differences are not completely clear. It is possible that the women in the project area, having been exposed to the partners' campaigning on these issues, felt more confidence in discussing this issue and in giving their true opinions in the course of the survey. However, the possibility of an effect from the project activities on incidence of violence should be treated seriously, and warrants closer monitoring or in-depth investigation, either in this project or in others that promote access to credit and improved livelihoods opportunities among women.

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**Appendix 1: Summary of definitions of women’s empowerment characteristics**

<b>Dimension</b>	<b>Characteristic</b>	<b>Cut-off: respondent scores positively if...</b>
Ability to make or influence decisions	Involvement in decisions on productive activities	Respondent is the sole decision-maker or has a large amount of influence over at least half of the decision-making areas in which the household is involved.
	Involvement in household spending decisions	Respondent is the sole decision-maker or has a large amount of influence over at least half of the decision-making areas in which the household is involved.
	Involvement in household-management decisions	Respondent is the sole decision-maker or has a large amount of influence over at least half of the decision-making areas in which the household is involved.
	Influence in community decision-making	Respondent agrees with at least three of the four statements about her ability to influence community decisions.
Self-perception	Attitude towards women’s economic roles	Respondent agrees with at least three of the five positive statements about women’s economic roles.
	Attitude towards women’s domestic roles	Respondent agrees with at least three of the four positive statements about women’s domestic roles.
	Opinion on women’s rights	Respondent agrees with at least four of the six positive statements about women’s rights.
	Self-efficacy	Respondent agrees strongly with at least three of the four statements derived from the General Self-Efficacy Scale.
	Psycho-social wellbeing	Respondent reports that she has not experienced any of the six psycho-social health problems ‘often’ over the past four weeks, and has only ‘sometimes’ experienced at most two of them.
Personal freedom	Personal autonomy	Respondent agrees that both of the statements about personal autonomy are at least partly true in her case.
	Opinion on gender-based violence	Respondent does not agree that a husband has a right to hit his wife in any of the eight situations mentioned.
	Experience of violence	Respondent reports that she is not aware of any woman close to her having suffered from any of form of violence, insult or theft during the 12 months prior to the survey.
Access to and control over resources	Access to credit	Respondent reports that the household has taken out a loan at least once in the past 12 months, and that she had at least joint involvement in decisions about whether and how much to borrow.
	Independent income	Respondent reports that she engaged in some productive activity during the past 12 months, and makes at least some contribution to household income.
	Role in cash management	Respondent reports having at least joint responsibility in keeping and managing the household’s cash.
	Personal savings	Respondent reports that her household could survive for at least two weeks in an emergency, using only her personal savings.
	Control over assets	Respondent reports having at least joint decision-making control over at least one type of livestock or productive asset.
Support from social networks	Social connectivity	Respondent strongly agrees with at least three of the five statements about her social connections.
	Participation in community groups	Respondent reports that she regularly attends meetings of at least one group in the community.