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# ANNEXES FOR GEM TAJIKISTAN

# FINAL EVALUATION REPORT

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## Contents

ANNEX 1: INDIVIDUAL QUANTITATIVE SURVEY .....	2
ANNEX 2: COMMUNITY QUALITATIVE METHODS.....	4
ANNEX 3: SYSTEMIC CHANGE INTERVIEWS.....	7
ANNEX 4: TABLES OF RESULTS .....	12
ANNEX 5: REFLECTIONS ON FIELDWORK AND DATA ANALYSIS .....	22

# ANNEX 1: INDIVIDUAL QUANTITATIVE SURVEY

## Sampling

Records from the project indicate that the project directly supported 851 small holder farmers, of which 767 (90%) are women. The survey identified an intervention group of 300 respondents directly supported by the project in the horticulture value chain (named the intervention group); and 480 respondents identified in villages in other districts in the province. Considering women's empowerment as one of the main outcome indicators for the GEM project, interviews were conducted with women only. Information referring to income and production were collected at household level, while information referring to empowerment will be collected at personal level.

In the intervention group the sampling strategy consisted in a stratified two-stage random sampling. Out of the 851 farmers supported on the horticulture value chain by the project, 767 are women. To select 300 respondents, clusters (in this case the villages) were selected according with a Probability Proportional to Size. 30 clusters were selected with 10 respondents to be selected from each cluster. Due to the requirement to have replacement respondent in each cluster, villages with less than 12 female PG members were excluded. This left 37 villages within the sample frame of which 29 were selected, as one village (Panjosyob) was selected twice during the sampling proportional to size due to having a larger number of female PG members. Within the sample of 29 villages, 10 respondents were randomly selected from each, with the exception of Panjosyob, Kulob, where 20 respondents were selected.

For selection of the comparison communities, the evaluation team agreed to exclude districts that have ongoing GEM activities in case of spill-over from intervention villages to surrounding villages. Other non-intervention districts were excluded if they did not provide a good comparison to the GEM intervention districts i.e. they were more mountainous and had less irrigated farmland, were areas with high representation of other INGOs, had well developed agricultural sector or were tourist/industrial regions. This resulted in two districts remaining in Khatlon province that provided a good comparison: Jilikul and Hamadoni.

Villages within these districts were randomly selected. First villages with less than 50 and more than 200 households were excluded. This was to ensure that there would be enough households within the village to meet the survey criteria; and to exclude the largest villages to enable the collation of village lists that will be constructed when the enumerator team arrive in the village. Village lists were not available from the local government so village lists were constructed in the village and household selected through a sample interval. If a village list could not be constructed at time of arrival, a random walk was conducted with a sample interval to select the households. The criteria for respondents is that they are female and had between 0.3 and 1 hectare of irrigated land in 2014. In each of the two districts, 15 villages were randomly selected and 16 respondents were randomly selected within each village. This gave a total comparison sample size of 480; with 240 from each district.

## Matching: constructing an appropriate counterfactual

The household survey ultimately involved 799 households, 299 from the intervention group and 500 from the comparison group, who were approached by the survey team during October and November 2017. The main analysis for the quasi-experimental component is conducted by comparing outcome variable means between the two households groups using propensity-score matching (PSM).

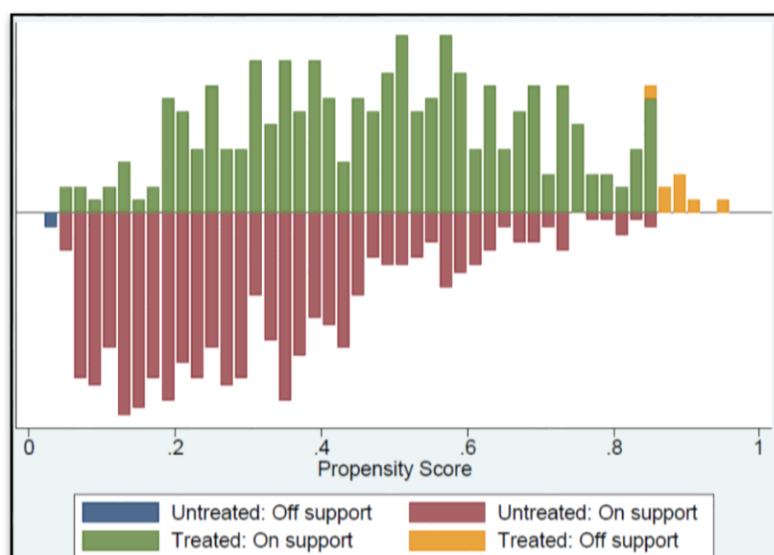
The propensity score is calculated using the following outcome indicators:

- Household size in 2014
- Education of the household head
- Education respondent

- Marital status respondent
- Land owned (log value) in 2014
- Number of crops produced by household in 2014
- Whether the household derived income from sources other than farming in 2014
- 1[household in the 1<sup>st</sup> quintile wealth index in 2013]
- 1[household in the 2<sup>nd</sup> quintile wealth index in 2013]
- 1[household in the 4<sup>th</sup> quintile wealth index in 2013]
- 1[household in the 5<sup>th</sup> quintile wealth index in 2013]

Table A1: Descriptive Statistics Before Matching	Intervention mean	Comparison mean
HH size in 2014	7.56	7.52
1[HHH has education greater than primary]	0.89	0.89
1[Respondent has education greater than primary]	0.8	0.82
1[Respondent is married]	0.82	0.83
Land owned (log value) in 2014	-0.96	-1.01
Crop diversification 2014	7.04	7.02
1[HH involved in sources of income other than crop in 2014]	0.89	0.88
1[HH in the 1st wealth quintile]	0.14	0.13
1[HH in the 2nd wealth quintile]	0.14	0.14
1[HH in the 4th wealth quintile]	0.23	0.24
1[HH in the 5th wealth quintile]	0.31	0.32
Observations (for each variable)	299	500

Figure A2. Common support area for propensity score matching



## ANNEX 2: COMMUNITY QUALITATIVE METHODS

Qualitative methods at the community-level were designed to provide insights into whether programme-related changes were occurring, particularly in difficult to measure or sensitive areas such as household decision-making, as well as how change happens over time for individuals, households and communities.

The primary method was via participatory focus group discussions with tools designed<sup>1</sup> and conducted separately for different groups in each community: community leaders; women producer group (PG) members; male PG members or family members of PG members (mostly husbands); and women PG members and non-members. Since men were not included in the household survey, focus groups with husbands and male family members was an important means of discovering attitudes and perceptions towards women's agency and leadership. Some tools such as the vignettes were used in discussions with both men and women to understand the range of perspectives and especially highlight areas of agreement and dissonance. The focus groups with husbands, community leaders and women who did not belong to the PGs were also designed to investigate evidence of spill-over effects from GEM activities and training amongst the wider community. In each focus group, a trained facilitator obtained informed consent from participants and then led them through a series of participatory exercises and questions, while a dedicated note-taker took detailed field notes that were later transcribed for analysis.

**Table: Focus Group Discussion tools, objectives and target groups**

FGD Tool	Objectives	Link to evaluation area	Who
<b>Community entry + Social mapping</b>	Changes in the external context / enabling environment at the community level	Rich picture of communities Understanding project's contribution	5-7 local leaders (incl. village head, head of the producer groups, teacher, other)
<b>Ladder of Life</b>	Changes in opportunities for smallholder farmers Availability of agricultural and market services. Who uses these? Who is excluded? What are the barriers to use for women? Benefits and disadvantages/risks of producer groups, and barriers to entry	Quality of income: stability, predictability, regularity of income Quality of market services Resilience strategies Perceptions of PGs and collective action	Women PG members Women non-PG members
<b>Vignettes (included private voting)</b>	Intra-HH decision-making, specifically: Women's influence on decisions on production practices Women's influence on how to spend income Women's influence on going outside the home (for community activities, for work outside) Women's influence on care responsibilities Women's influence on decisions of large investments and assets Relative influence over group decisions	Ability to engage in decision-making at HH and community Influence decisions on production practices Contribution to HH income and decision-making on spending income Women's decision-making power in communities	Women PG members Male partners of PG members

<sup>1</sup> The design of the focus group discussion tools was informed and adapted primarily from two sources: a) the GENNOVATE research initiative examining gender norms and agency in agriculture and natural resource management (methodology accessible at [http://gender.cgiar.org/wp-content/uploads/2018/02/GENNOVATE-Methodology\\_Feb2018\\_FINAL.pdf](http://gender.cgiar.org/wp-content/uploads/2018/02/GENNOVATE-Methodology_Feb2018_FINAL.pdf)); b) van Hemelrijck, A. (2017) *Governance in Myanmar: Evaluation of the 'Building equitable and resilient livelihoods in the Dry Zone' project, Effectiveness Review Series 2015/16* (<https://policy-practice.oxfam.org.uk/publications/governance-in-myanmar-evaluation-of-the-building-equitable-and-resilient-liveli-620177>).

<b>Power spectrum (included private voting)</b>	<p>Meaningful decision-making at the group/community level, specifically:</p> <p>Women's influence in mixed-sex spaces at community level</p> <p>Women's power beyond their group and community</p> <p>Do women influence community decisions that will improve their well-being? How? Who?</p>	<p>Ability of women to engage in decision-making at community</p> <p>Knowledge of rights and relationship between legal interventions and well-being</p>	<p>Women PG members</p> <p>Husbands of PG members</p>
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Community sampling was undertaken at the start of the evaluation in consultation with local partners. A set of community sampling criteria and final selection was informed by discussions with Oxfam staff and partners, balancing feasibility with a desire to visit the most diverse/broad range of communities

include the broadest range of communities including across the sample elements of the following:

- Range of districts: Including 4 of the 5 districts that GEM has been implemented;
- Range of ethnic and language backgrounds: at least 1 community with large Uzbekh population as the rest tend to be majority Tajik;
- Range of geographical conditions and ease of market access): at least 1 mountainous/remote community and 1 peri-urban/easy access community;
- Range of Oxfam interventions: at least 1 high intervention community (location of previous and existing Oxfam interventions) and 1 GEM-only community;
- Range of GEM interventions: at least 1 community that had done the PCVA, 1 that had a greenhouse, 1 with tomatoes and 1 with dried apples;
- Range of producer group strengths, as determined by Oxfam staff and partners: at least 1 community with a strong producer group and 1 with a weaker producer group.

In addition, where possible, there was an attempt to avoid communities where the quantitative survey was being administered (to avoid research fatigue). Taking these criteria into consideration, the table below shows the four communities that were visited for the community-level qualitative component.

**Table: Schedule and characteristics of communities selected for qualitative component**

Criteria	Site 1	Site 2	Site 3	Site 4
<b>Community</b>	<b>Kulchashma</b>	<b>Istiqlol 2</b>	<b>Hasani Kurbon</b>	<b>Guliston</b>
<b>Date of visit</b>	<b>11-12 Oct</b>	<b>13-14 Oct</b>	<b>30-31 Oct</b>	<b>7-8 Nov</b>
<b>District</b>	Muminabad	Vaksh	Vose	Farkhor
<b>Ethnic</b>	Tajik	Uzbekh	Tajik	Tajik
<b>Geography and market access</b>	Mountainous/remote, irrigation. Small village.	Flat. 'Modern' village with market	Flat land, Irrigation. Close to market.	Rain-fed; need a taxi to access market.
<b>Complementary Oxfam interventions</b>	Challenge Fund / WASH	GREAT	Challenge Fund / savings group	GEM-only
<b>GEM intervention</b>	Primarily tomato; dried apple	Primarily tomato; Greenhouse	Tomato PCVA	Tomato
<b>Strength of PG</b>	Strong	Not sure	Middle	Weak

\* The qualitative methods were first piloted and adapted Gulobod, a community relatively near to the main market town.

Within communities, local leaders and/or producer group members were informed of the tentative discussion schedule prior to the evaluation team's arrival to help with participant recruitment. Participation

of a wide range of project participants and non-participants and community leaders was encouraged, as well as a demographic diversity (e.g. representing a range of ages). The participants self-selected often depending on capacity to reach the meeting venue and time availability, though efforts were made once in the community to actively invite harder-to-reach populations especially non-project participants. The ideal number of participants in the discussions was 8-12 but that varied depending on community, with some having many more than that.

The qualitative evaluation team also stayed with local families in the communities visited to conduct informal interviews, life histories and do direct observation, to see and experience some of the more invisible topics of the evaluation, such as changing attitudes, norms and dynamics in the household. Staying in the communities also served to enhance trust and familiarity with the community leaders and focus group participants, increase the potential that harder to reach populations (especially non-project participants) could approach them in their own time and leave open the opportunity to unveil some potential 'unknown unknowns'.

# ANNEX 3: SYSTEMIC CHANGE INTERVIEWS

The Systemic Change Interview approach (SCIA) draws on Outcome Harvesting, Most Significant Change and Collaborative Outcome Reporting approaches. The overall aim is to use project stakeholders to identify changes and outcomes; identify gaps in information needed to explain the changes (specifically in relation to a market systems project); and build up a list of questions for specific stakeholders based on these information gaps. Key informant interviews can then be conducted with these stakeholders to verify and elaborate upon these changes, after which the change descriptions are revised and updated.

## **Step 1: Identify the levels and domains of the Theory of Change to be investigated**

GEM being a markets project, has a substantial focus on systemic change and has a strategy to work with government departments, private sector, media and civil society as well as smallholder producers to facilitate change in the dairy value chains. When such change happens it may not be limited to a specific intervention group or direct beneficiaries – the aim is to facilitate positive changes that benefit agricultural producers in targeted value chains, whether or not they are direct project participants. These changes are therefore difficult to capture from a household survey that compare intervention and comparison groups; or from qualitative techniques at the community level if they are only being conducted in project areas.

Techniques such as Outcome Harvesting, Most Significant Change and Collaborative Outcome Reporting are useful approaches that enable the collection of data for complex projects such as market systems programmes. If used well they can also be a means of capturing unintended and negative outcomes of a project intervention. For this reason, the GEM evaluation is using SCIA to understand the outcomes of the project in relation to market systems change. During the Theory of Change workshop held in Dushanbe October 3-4 2017 a number of research questions were identified by project stakeholders, which will also be collected through SCIA.

## **Step 2: Design questions to enable collection of change statements from project stakeholders and documentation**

### **Step 2a: Questions to ask stakeholders to prompt thinking and discussions**

At the Theory of Change workshop, we asked participants to record and share their experience of what had changed in the last three years, specifically changes regarding their relations with other stakeholders. Participants were asked to give examples of one positive and one negative change. To help participants think about these changes they were given a guiding question: “In the last three years, what positive and negative changes have you experienced in working with the private sector and local agribusinesses, government departments, civil society or smallholder farmers?”

### **Step 2b: Get participants to complete templates for each change identified**

For each of the changes they identified, participants were asked to complete a template to capture details on what the change was, when and where it took place, who was involved in the change and what were the consequences of the change. Some of the answers were vague or focussed mostly on personal change in income and farming practices, however a total of 20 change examples were collected.

## **Step 3: Grouping, selecting and categorising change statements**

### **Step 3a: Grouping change statements**

At this point, a number of the changes identified were overlapping so it was necessary to group and categorise these outcome descriptions and collate the information into one outcome description, this led to

the formulation of 20 outcome descriptions:

Women smallholder farmers have increased confidence to speak in public and negotiate with others	Women have more secure access to and ownership over land
Farmers work together more to produce and sell agricultural goods	Increased amount and quality of agricultural products in and from Khatlon region
Government authorities and farmers have increased knowledge of women's land rights, including where women can go to access legal support	Women smallholder farmers benefit from increased access to profitable local and international market channels
Smallholder farmers use their new knowledge of improved agricultural production practices	Women smallholder farmers have increased their economic status and contribution to household income
Company trained women smallholder farmers in improved processing practices to enable access to international market	Increased quality of life for smallholder farmers
Smallholder farmers have increased interest in agriculture as a business	Local authorities have improved their approach to conducting training
Producer group members have access to a greenhouse to grow and sell early seedlings to their local communities	National law to dekhon farming changed to benefit women smallholder farmers
Better irrigation channels enable communities to improve control of water resources for agriculture	Increased incidence of domestic violence as a backlash to women's increasing participation outside the household
Input suppliers have increased service delivery to the region, increasing their client base and improving smallholder farmers' access to good-quality seeds	Increased overall workload for women smallholder farmers (and women and girls in households) due to new economic responsibilities in addition to household tasks
AIMS platform enhances direct linkages between smallholder farmers and the private sector (though risk of monopolies)	Multi-stakeholder forums facilitated direct linkages between women smallholder farmers and other key stakeholders

### Step 3b: Selecting change statements

The next step was to determine which of these 20 outcomes we wanted to investigate further. For this the main criteria was that it related to (1) the research questions identified in the Theory of Change workshop; (2) the market services stream of the Theory of Change; or (3) was a systemic change that wouldn't be captured from the household survey or community focus group discussions.

Change statement	ToC Ques	Meso + macro	Existing methods	Select for OH
Women smallholder farmers have increased confidence to speak in public and negotiate with others	X		Survey	No
Farmers work together more to produce and sell agricultural goods	X		Survey	No
Government authorities and farmers have increased knowledge of women's land rights, including where women can go to access legal support	X	X	Partly	Yes
Smallholder farmers use their new knowledge of improved agricultural production practices	X		Partly	No
Company trained women smallholder farmers in improved processing practices to enable access to international market	X	X	X	Yes



Smallholder farmers have increased interest in agriculture as a business	X		FGD	No
Producer group members have access to a greenhouse to grow and sell early seedlings to their local communities			FGD	No
Better irrigation channels enable communities to improve control of water resources for agriculture			Survey	No
Input suppliers have increased service delivery to the region, increasing their client base and improving smallholder farmers' access to good-quality seeds	X	X	Partly	Yes
AIMS platform enhances direct linkages between smallholder farmers and the private sector (though risk of monopolies)	X	X	Partly	Yes
Women have more secure access to and ownership over land	X		Survey	No
Increased amount and quality of agricultural products in and from Khatlon region	X	X		Yes
Women smallholder farmers benefit from increased access to profitable local and international market channels	X	X	FGD	Yes
Women smallholder farmers have increased their economic status and contribution to household income	X		Survey	No
Increased quality of life for smallholder farmers	?		FGD	No
Local authorities have improved their approach to conducting training	X	X		Yes
National law to dekhan farming changed to benefit women smallholder farmers	X	X		Yes
Increased incidence of domestic violence as a backlash to women's increasing participation outside the household			Survey	No
Increased overall workload for women smallholder farmers (and women and girls in households) due to new economic responsibilities in addition to household tasks			Survey FGD	No
Multi-stakeholder forums facilitated direct linkages between women smallholder farmers and other key stakeholders	X	X		Yes

It was decided that of the 20 change statements, based on the criteria 9 would be taken forward for the SCIA component of the GEM evaluation in Tajikistan.

### Step 3c: Categorising change statements

Once the changes to be investigated are selected we can categorise the changes into four groups: positive intended; positive unintended; negative intended and negative unintended. You can see in the table below that the majority of outcomes are positive intended. This categorising process helps to check if we have collected a range of outcomes and that we are not only checking on positive outcomes. Ideally in this process we would have identified more unintended (both positive and negative) outcomes. The collection of change statements should be amended to better facilitate the collection of unintended changes. More time dedicated to harvesting outcomes in the Theory of Change workshop may have helped to encourage the thinking and trust for stakeholders to contribute more unintended and negative changes.

Figure: Outcomes categorised into positive, negative, intended and unintended

<b>Unintended Outcomes</b>	<b>Positive Outcomes</b>		<b>Intended outcomes</b>
	<ul style="list-style-type: none"> <li>Local authorities have improved their approach to conducting training</li> </ul>	<ul style="list-style-type: none"> <li>Government authorities and farmers have increased knowledge of women's land rights, including where women can go to access legal support</li> <li>Company trained women smallholder farmers in improved processing practices to enable access to international market</li> <li>Input suppliers have increased service delivery to the region, increasing their client base and improving smallholder farmers' access to good-quality seeds</li> <li>Increased amount and quality of agricultural products in and from Khatlon region</li> <li>Women smallholder farmers benefit from increased access to profitable local and international market channels</li> <li>National law to dekhan farming changed to benefit women smallholder farmers</li> <li>Multi-stakeholder forums facilitated direct linkages between women smallholder farmers and other key stakeholders</li> </ul>	
	<ul style="list-style-type: none"> <li>AIMS platform enhances direct linkages between smallholder farmers and the private sector (though risk of monopolies)</li> </ul>		
	<b>Negative outcomes</b>		

## Step 4: Drafting initial details of the change statement description, identifying information gaps and associated informants

### Step 4a: Detailing the outcome description

This step involves adding more detail to the existing outcome description. Currently the description will be limited to the information collected in step 2; what the change was, when and where it took place, who was involved in the change and what were the consequences of the change. Based on a review of a paper written by ITAD<sup>2</sup>, a number of failings in market programme evaluations were identified. These generally referred to concepts that were missing or lacking from evaluations of Markets for the Poor (M4P) programmes including scale, sustainability and systemic change. These areas have therefore been incorporated into a template for the outcome description so as to ensure capture of relevant information in these areas. Below is an outline of the sub-headings in the outcome description template. Content is added under each sub-heading by the evaluator based on what they already know about the project, from what they have heard or read in the workshops and documentation.

Figure: Sub-headings from outcome description template

<b>Description:</b> (What was the change; when and where did it happen; who was involved in the change; and what was the consequence of the change?)
<b>Outcome identified from:</b> (Name of stakeholder, report, reference)

<sup>2</sup> Ruffer, T. & Wach, E. (2013). *Review of M4P Evaluation Methods and Approaches*. ITAD. Commissioned by UK DFID.

<b>Outcome verified by:</b> (Name of stakeholders interviewed for verification)
<b>Contribution:</b> (What did GEM do that contributed towards this outcome? What other actors were significant contributors?)
<b>Evidence of systemic change:</b> (Crowding in, copying, replication, sector growth, backward and forward link-ages)
<b>Scale:</b> (What is the estimated reach of this outcome? How many smallholder farmers/indirect beneficiaries is it likely to impact? How was this identified?)
<b>Sustainability:</b> (Static or dynamic? Commercial viability, investment by private or public sector, innovation, organisational capacity).
<b>Impact on women:</b> (How have women been specifically involved/impacted by this change?)
<b>Negative consequences:</b> (What are the actual or potential negative impacts of this change? Do these differ for men and women?)

#### Step 4b: Identify information gaps and associated informants

For ease of explanation, steps 4a and 4b are separated here but in practice these steps were combined. While detailing the outcome description (step 4a) a number of gaps in the information become apparent and it is in this step that we record all these gaps and questions we have about the outcome and determine where we can get this information from. Some of the missing information may be answered from the community level qualitative research and some from the household survey but we will also need to interview other project stakeholders to better understand these outcomes and to understand their perspective.

#### Step 5: Drafting Key Informant Interview questions

Once the information gaps have been identified in step 4 it is then possible to group these gaps/questions according to the associated informant that is required to be interviewed. The information gaps will need to be structured into an interview checklist

#### Step 6: Conducting and documenting key informant interviews

Key informant interviews were conducted by the qualitative research consultant in-person and via telephone. Interviews took place in November 2017 with the following key informants:

No.	Stakeholder	Organization
1	Project Partner	NGO League of Women Lawyers
2	Buyer of dried apples	LLC Fruit Valley
3	Project Partner	NGO Neksigol
4	Input supplier	LLC Arsi Somon
5	Government official knowledgeable about change to <i>dekhan</i> farming law	Ministry of Justice
6	Local buyer of tomatoes	Local buyer of tomatoes
7	Ministry of Agriculture participating in the forum of stakeholders	Hukumat
8	Government bodies involved in creating a market	Mahalla Committee

# ANNEX 4: TABLES OF RESULTS

## Project Exposure

	1	2	3	4	5
	Producer group meeting	Training on agricultural production practices	Training on leadership, assertiveness and negotiation	Training on women's rights	Training on marketing strategies, collection and value addition
Intervention group mean	0.95	0.94	0.87	0.91	0.89
Comparison group mean	0.02	0.06	0.01	0.10	0.04
Difference:	0.94***	0.88***	0.86***	0.82***	0.86***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Observations (intervention group)	284	284	284	284	284
Observations (total)	772	772	772	772	772

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

## Household income - part 1

	1	2	3	4	5	6
	Amount spent on food consumption- per adult equivalent per day	Amount spent on non-food items - per adult equivalent per day	Total amount spent - per adult equivalent per day	Log(Food consumption per adult equivalent per day)	Log(Non food consumption per adult equivalent per day)	Log(Total household consumption per adult equivalent per day)
Intervention group mean	10.10	9.36	19.46	2.22	1.91	2.83
Comparison group mean	9.01	6.79	15.80	2.11	1.40	2.58
Difference:	1.09***	2.57**	3.66***	0.12***	0.51***	0.25***
	(0.42)	(1.04)	(1.25)	(0.04)	(0.07)	(0.04)
Observations (intervention group)	284	284	284	284	284	284
Observations (total)	772	772	772	772	772	772

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

### Household income - part 2

	1	2	3	4
	Monthly expenditure	Annual expenditure	Wealth index	Wealth index - normalised
Intervention group mean	504.40	9437.19	0.40	0.27
Comparison group mean	305.69	6884.12	0.35	0.23
Difference:	198.71***	2553.07*	0.05	0.03
	(51.36)	(1336.09)	(0.13)	(0.08)
Observations (intervention group)	284	284	272	272
Observations (total)	772	772	760	760

### Income from other sources

	1	2	3	4	5	6
	Reported income from salaried government work-log	Reported income from salaried non government work-log	Reported income from casual work-log	Reported income from own business-log	Reported income from remittances-log	Reported income from pension-log
Intervention group mean	9.23	8.72	8.93	8.71	9.19	8.57
Comparison group mean	8.83	9.35	7.81	9.37	8.97	8.13
Difference:	0.39***	-0.02	1.28***	-0.69	0.11	0.44***
	(0.13)	(0.73)	(0.36)	(0.48)	(0.22)	(0.11)
Observations (intervention group)	114	27	90	35	75	121
Observations (total)	241	34	191	66	201	337

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

### Dairy

	1	2	3	4
	How many milking cows/goats/sheep do you have right now?	In the last week did you produce any milk or milk products?	What is the total quantity of milk that was PRODUCED in the last week	What was the quantity of milk and milk products that was SOLD in the last week
Intervention group mean	0.96	0.99	16.01	1.56
Comparison group mean	0.86	0.98	14.34	0.65
Difference:	0.10	0.01	1.69	0.83
	(0.07)	(0.01)	(1.39)	(0.58)
Observations (intervention group)	216	154	152	152
Observations (total)	557	369	360	358

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

### Investment

	1	2	3	4
	Total invested in farming, land, off-farm business, education and health	Total invested in farming, land, off-farm business, education and health-log	Total invested in farming, land, off-farm business	Total invested in farming, land, off-farm business-log
Intervention group mean	2588.74	7.35	919.73	6.18
Comparison group mean	1414.53	6.77	416.09	5.49
Difference:	1174.21***	0.58***	503.63***	0.69***
	(191.55)	(0.10)	(99.52)	(0.15)
Observations (intervention group)	284	284	284	240
Observations (total)	772	766	772	559

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

### Crop Production

	1	2	3	4	5	6	7	8	9
	Number of crops harvested	Number of crops sold	Total harvested (kg)	Total harvested (log)	Total sold (kg)	Total sold (log)	Total revenue from selling crops	Total revenue from selling crops (log)	Proportion of harvest which was sold (%)
Intervention group mean	7.30	1.56	3013.01	7.27	1689.61	6.20	4465.54	7.11	0.22
Comparison group mean	7.06	0.71	2069.27	6.82	1048.45	6.07	3831.57	7.12	0.16
Difference:	0.24*	0.85***	943.74	0.45***	742.33*	0.27	1164.38	0.17	0.07***
	(0.14)	(0.13)	(598.19)	(0.09)	(404.52)	(0.18)	(999.02)	(0.20)	(0.02)
Observations (intervention group)	284	284	284	284	190	190	190	190	284
Observations (total)	772	772	772	770	340	340	340	338	770

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

### Tomatoes and apples - part 1

	1	2	3	4
	total quantity of tomato harvested during the past 12 months	total quantity of tomato harvested during the past 12 months (log)	total quantity of apple harvested during the past 12 months	total quantity of apple harvested during the past 12 months (log)
	(kg)		(kg)	
Intervention group mean	462.45	5.28	222.92	4.53
Comparison group mean	148.88	4.32	38.68	3.09
Difference:	313.39***	0.96***	184.45***	1.46***
	(55.58)	(0.11)	(37.68)	(0.28)
Observations (intervention group)	271	266	106	104
Observations (total)	712	698	183	171

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

### Tomatoes and apples - part 2

	1	2	3	4
	Value of tomato sales	Value of tomato sales - log	Value of dried apple sales	Value of dried apple sales - log
Intervention group mean	1202.25	6.13	304.50	5.45
Comparison group mean	381.88	5.48	208.13	5.27
Difference:	847.29***	0.70***	67.50	-0.09
	(253.88)	(0.26)	(83.36)	(0.46)
Observations (intervention group)	118	118	20	20
Observations (total)	149	149	27	27

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

### Other crops

	1	2	3
	total quantity of wheat harvested during the past 12 months	total quantity of onion harvested during the past 12 months	total quantity of cotton harvested during the past 12 months
	(kg)	(kg)	(kg)
Intervention group mean	1570.20	367.69	2890.51
Comparison group mean	1502.00	229.88	1509.97
Difference:	219.14	174.49**	1596.67*
	(752.37)	(83.57)	(907.52)
Observations (intervention group)	203	143	53
Observations (total)	385	217	134

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

### Quality and sufficiency of income

	1	2	3	4	5
	Expected income more from tomato	Income came on time from tomato	Expected income more from apple	Income came on time from apple	HH had to sell assets to cover expenditure
Intervention group mean	0.65	0.83	0.72	0.88	0.36
Comparison group mean	0.57	0.80	0.64	0.94	0.23
Difference:	0.06	0.03	-0.04	-0.02	0.13***
	(0.07)	(0.06)	(0.16)	(0.09)	(0.04)
Observations (intervention group)	205	205	68	68	284
Observations (total)	288	288	81	81	772

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

### Improved crop production practices

	1	2	3
	HH practices pest control	HH practices crop rotation	HH practices improved irrigation
Intervention group mean	0.94	0.92	0.46
Comparison group mean	0.78	0.75	0.57
Difference:	0.16***	0.17***	-0.12**
	(0.03)	(0.03)	(0.05)
Observations (intervention group)	284	284	284
Observations (total)	772	772	772

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



### Access to market services

	1	2	3	4	5	6	7	8
	HH gets weather updates	HH gets latest prices	HH gets advice from extension workers	HH purchased fertiliser	HH purchased pesticide	In the last 12 months, have you received inputs for free?	Are you aware of insurance against adverse weather events or loss of crops/livestock	Are you currently covered with an insurance against adverse weather events or loss of crops/livestock
Intervention group mean	0.63	0.74	0.71	0.11	0.79	0.18	0.57	0.37
Comparison group mean	0.31	0.31	0.05	0.07	0.84	0.06	0.42	0.25
Difference:	0.31***	0.42** *	0.66***	0.04	-0.05*	0.12***	0.16***	0.13**
	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.06)
Observations (intervention group)	284	284	284	284	284	284	284	163
Observations (total)	772	772	772	772	772	772	772	337

### Access to savings and credit

	1	2	3	4
	HH has savings – average amount	HH keeps savings in the house	HH has access to credit	HH has taken a loan
Intervention group mean	359.45	0.87	0.64	0.37
Comparison group mean	401.94	0.95	0.44	0.27
Difference:	-42.49	-0.07	0.20***	0.10**
	(166.31)	(0.06)	(0.04)	(0.04)
Observations (intervention group)	284	47	284	284
Observations (total)	772	137	772	772

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

### Access to land and legal services

	1	2	3	4	5
	HH has land title	Respondent understands meaning of joint marital property	Respondent answers 'true' to women having equal right to land on divorce	Respondent sought information on land access	Respondent sought information on family issues
Intervention group mean	0.96	0.46	0.94	0.52	0.35
Comparison group mean	0.95	0.33	0.83	0.10	0.08
Difference:	0.01	0.14***	0.11***	0.42***	0.27***
	(0.02)	(0.05)	(0.03)	(0.04)	(0.04)
Observations (intervention group)	284	284	284	284	284
Observations (total)	772	772	772	772	772

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

### HH decision making Part 1 - % of respondents who have sole decision-making power or feel that they can influence decisions to a large extent

	1	2	3	4	5
	What practices to use in farming	How to spend money used from farm	Who cooks, cleans the house	Personal travel to visit relatives	Personal participation in group activity
Intervention group mean	0.75	0.70	0.98	0.70	0.77
Comparison group mean	0.71	0.68	0.96	0.78	0.53
Difference:	0.04	0.02	0.02	-0.08**	0.25***
	(0.04)	(0.04)	(0.01)	(0.03)	(0.04)
Observations (intervention group)	284	284	284	284	284
Observations (total)	772	772	772	772	772

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

**HH decision making Part 2 - % of respondents who have at least joint decision-making power in the area considered**

	1	2	3	4	5
	What practices to use in farming - joint	How to spend money used from farm - joint	Who cooks, cleans the house - joint	Personal travel to visit relatives - joint	Personal participation in group activity - joint
Intervention group mean	0.77	0.81	0.91	0.88	0.90
Comparison group mean	0.56	0.43	0.79	0.66	0.40
Difference:	0.21***	0.39***	0.12***	0.22***	0.50***
	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)
Observations (intervention group)	284	284	284	284	284
Observations (total)	772	772	772	772	772

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

**Care work**

	1	2
	Respondent satisfied/very satisfied with division of labour	Respondent has more time for leisure
Intervention group mean	0.98	0.49
Comparison group mean	0.98	0.46
Difference:	-0.01	0.03
	(0.01)	(0.04)
Observations (intervention group)	284	284
Observations (total)	772	772

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

**Group decision making**

	1	2	3	4
	HH member of producer group	HH member of savings group	HH member of CBO group	HH involved in decision making in the producer group
Intervention group mean	0.99	0.36	0.15	0.98
Comparison group mean	0.02	0.11	0.09	1.00
Difference:	0.97***	0.25***	0.07**	-0.03
	(0.01)	(0.04)	(0.03)	(0.02)
Observations (intervention group)	284	284	284	280
Observations (total)	772	772	772	284

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

**Opinions on women's leadership (1) – Women said 'agree or strongly agree'**

	1	2	3	4	5
	'I feel I have a number of good qualities'	'I continue to work hard on tasks even when others oppose me'	'Even when my farm is doing well I keep my eyes open in case I find a way to improve it'	'I feel comfortable speaking out at a meeting of men and women'	'Husbands get upset when their wives speak out on public issues' (Disagree / strongly disagree)
Intervention group mean	0.97	0.90	0.99	0.74	0.25
Comparison group mean	0.99	0.78	0.98	0.68	0.33
Difference:	-0.02*	0.12***	0.01	0.06*	-0.08*
	(0.01)	(0.03)	(0.01)	(0.04)	(0.04)
Observations (intervention group)	284	284	284	284	284
Observations (total)	772	772	772	772	772

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

**Opinions on women's leadership (2) – Women said 'agree or strongly agree' (unless stated)**

	6	7	8	9	10
	'If a woman earns more money than her husband, it's almost certain to cause problems' (Disagree / strongly disagree)	'Having a job is the best way for a woman to be an independent person'	'On the whole, men make better entrepreneurs than women' (Disagree / strongly disagree)	'If the wife is working outside the home, the husband should help her with chores'	'It is better for women to work together to solve problems than working alone'
Intervention group mean	0.52	0.98	0.17	0.93	0.98
Comparison group mean	0.57	0.83	0.20	0.88	0.93
Difference:	-0.06	0.15***	0.03	0.05**	0.05***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
Observations (intervention group)	284	284	284	284	284
Observations (total)	772	772	772	772	772

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

### Resilience to shocks

	1	2
	HH crop production affected by weather/disease	Event had a significant impact on income earned
Intervention group mean	0.67	0.43
Comparison group mean	0.38	0.64
Difference:	0.29***	-0.21***
	(0.04)	(0.06)
Observations (intervention group)	284	191
Observations (total)	772	367

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

### Gender based violence

	1	2	3
	Agrees that any violence is unacceptable	Prevalence of violence	Violence reported
Intervention group mean	0.31	0.31	0.28
Comparison group mean	0.08	0.14	0.05
Difference:	0.23***	0.16***	0.20***
	(0.04)	(0.04)	(0.07)
Observations (intervention group)	259	265	81
Observations (total)	644	655	125

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

### *In your opinion, is it acceptable that a woman is beaten by her husband if:*

	1	2	3	4	5	6	7
	She disobeys her husband or other family members	She neglects children or didn't prepare food	She spends money without permission	She goes out without permission	He is drunk	He suspects that she has been unfaithful	Any other case not already mentioned
Intervention group mean	0.38	0.44	0.47	0.53	0.35	0.40	0.29
Comparison group mean	0.72	0.72	0.66	0.67	0.42	0.65	0.41
Difference:	-0.35***	-0.28***	-0.19***	-0.14***	-0.07	-0.24***	-0.13***
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Observations (intervention group)	265	264	264	265	262	265	263
Observations (total)	655	654	654	655	650	654	651

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

# ANNEX 5: REFLECTIONS ON FIELDWORK AND DATA ANALYSIS

For the quantitative survey fieldwork challenges included:

1. Incomplete lists of members of the groups resulting in a shortage of respondents in some villages. Once in the village it was realised that there were additional members that were not included on the lists and they were selected as replacements;
2. In some of the selected comparison villages there was no irrigated land meaning the survey could not be conducted as this was part of the respondent criteria to own/rent irrigated land. Replacement villages were selected;
3. There were some technical difficulties with the tablets due to offline mode and lack of internet connection in remote villages. This meant there were delays in uploading the questionnaires to the database. To resolve this, supervisors were given data packages every 2 to 3 days to upload questionnaires.

This evaluation exercise deliberately relied on a combination of quantitative and qualitative methods and data, in order to enhance both our understanding of the results and context and the validity of findings. The analysis has relied on quasi-experimental methods in order to allow for causal inference and determine the impact of the project on those it reached. The statistical rigour of these methods depends to a great deal on the quality of data and the robustness of the matching approach used. Household data was subject to a series of quality assurance checks both during fieldwork and once the data was collated. The matching approach also underwent a number of statistical procedures to select the right matching algorithm, and replication materials can be made available on request. Ultimately, the statistical analysis relies on the comparison group being an appropriate counterfactual for the project intervention, and the matching process ensures as far as possible this is the case based on observable characteristics. There remains the possibility of unobserved variables introducing bias and reducing the validity of results. However, the triangulation of statistical analysis provides an important source of triangulation to sense-check and corroborate findings.

The qualitative analysis does not attempt to allow for causal inference, but does provide valuable context, triangulation, and nuance to the statistical analysis. Further, qualitative data has shed light on important aspects of programme implementation and the policy environment in which Oxfam and local partners operate. This data is essential to understanding how and why the project leveraged impact (or failed to). Focus group data was designed to ensure the lived experiences of project participants was adequately captured in the evaluation, both as a unique source of knowledge and reflection on how the programme delivered improvements (or did not) and in order to reflect Oxfam's values through the co-production of insight and learning for future programming. The quality of focus group and interview data necessarily relies on highly skilled facilitation and the use of research tools to engage participants in a meaningful and authentic way; the application of vignettes for community-level discussion was one attempt to do so.

The combination of household survey with in-depth community group discussions, direct observation and stakeholder interviews, building on a participatory theory of change workshop to elicit local priorities for evaluation questions, was a viable evaluation model. It does, however, require resources and time in order to deliver high quality outputs, and this may not be feasible or cost effective for all programmes.

Not all quasi-experimental impact evaluations are the same. Choices made during sampling, selection of the comparison group, and at the analysis stage are crucial in assessing the overall level of confidence in the results. This document provides a framework to assess the risk of bias against ten predetermined parameters, specifically for ex-post quasi-experimental impact evaluations. Lower overall risk, provides higher confidence in the results.