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IFAD11 Impact Assessment Report

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Action: The Executive Board is invited to review the IFAD11 Impact Assessment Report presenting results on aggregate development effectiveness.

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Contents

Executive summary

1. IFAD is the only international financial institution that measures the impact of its investments by systematically conducting impact assessments (IAs) on a sample of at least 15 per cent of projects closing during each replenishment period. Impact estimates on key indicators are aggregated and projected to the corporate level. For the Eleventh Replenishment of IFAD's Resources (IFAD11), 24 out of 96 projects that closed between 2019 and 2021 were assessed, equivalent to 25 per cent. The sample covers US$3.1 billion in IFAD investments and represents an overall investment of US$7.1 billion (including cofinancing). The sample was selected following a protocol and a set of inclusion and exclusion criteria defined in the Development Effectiveness Framework, to ensure feasibility and rigour.[1]

2. Estimates show that IFAD has exceeded all the targets set in the IFAD11 Results Management Framework, except for the nutrition target. These investments collectively improved the incomes (IFAD goal) of 77.4 million beneficiaries by at least 10 per cent, against the target of 44 million. In pursuance of strategic objective (SO) 1, the productive capacities of 62 million beneficiaries were improved against the target of 47 million, and the market access (SO2) of 64.4 million beneficiaries increased against a target of 46 million – in both cases, by at least 20 per cent. Around 38 million beneficiaries have seen their resilience (SO3) improve by at least 20 per cent. The target of 12 million people with improved nutrition (10 per cent or more) was not met. This is likely explained by the fact that projects assessed were designed before nutrition was mainstreamed.

3. In addition to measuring corporate level impacts, the IAs also provide a wealth of information that feed into future project designs and strategies. Four overall lessons from the IFAD11 IAs are summarized as follows. First, **it is essential to invest in value chains and particularly in middle segments of agrifood systems (including processing, transformation and distribution) to maximize benefits**. Benefits from increased production and productivity translate into better income and livelihoods when well-functioning value chains connect beneficiaries to markets. Second, **to strengthen resilience more effectively it is key to distinguish between chronic and acute shocks** and elaborate differentiated strategies. Availability of social capital and access to institutions, including credit, help achieve this objective. Third, **food security does not translate automatically into improved nutrition** unless the project has a specific comprehensive nutrition strategy. Fourth, **women's decision-making power increased due to IFAD interventions**, but more focused interventions are needed for gender transformation. Mainstreaming nutrition and gender with a solid theory of change and ensuring that adequate resources are included at project design are key to achieving future progress.[2]

[1] Due diligence through a protocol has been carefully used to ensure rigour, including: (i) a larger sample than the minimum required; (ii) statistical analyses to rule out systematic differences between the sample and the universe; (iii) robustness checks using simulations; and (iv) pooled household-level data analysis that includes country/project fixed effects and replicates aggregate impact estimates.

[2] Following recommendations from the Executive Board, the sample for IFAD12 IAs has been selected using stratified random sampling.

IFAD11 Impact Assessment Report

I. Introduction

1. IFAD measures the impact of its investments by systematically conducting impact assessments (IAs) on a sample of 15 per cent of projects selected from those closing during each replenishment period, following a protocol and a set of criteria established in the Development Effectiveness Framework (DEF).[3]

2. This report presents the results of the IA conducted for the IFAD11 period, based on 24 projects. These projects were selected from the universe of 96 projects that closed during the IFAD11 replenishment period (2019-2021). This sample corresponds to 25 per cent of the total, exceeding the required sample size of at least 15 per cent, in response to a recommendation made by the Evaluation Committee at its 109th session held in June 2020.[4] The projects were identified using a set of inclusion and exclusion criteria laid out in the approved DEF to ensure feasibility and rigour.[5]

3. Once the sample was identified, IFAD applied due diligence by undertaking sensitivity analyses in accordance with Executive Board recommendations.[6] These analyses assess whether the sample is systematically different from the portfolio under consideration and measure the robustness of the corporate impact estimates to changes in the sample and the type of questionnaire used. The results of these statistical tests are described in detail in annex I.

4. IFAD's corporate IA methodology was pioneered under the IFAD9 Impact Assessment Initiative; systematized, standardized and improved in IFAD10; and further strengthened in IFAD11. The methodology relies on ex post quasi-experimental IAs and includes detailed data collected through tablet-based questionnaires from beneficiaries and comparison households and communities.[7] The methodology allows for project impact measurements that are then aggregated and projected to the entire portfolio of closing projects to estimate corporate level achievements against Tier II development indicator targets.[8]

5. The IFAD11 IAs were conducted between 2019 and 2021 and faced significant implementation challenges. The COVID-19 pandemic and related restrictions, combined with other unexpected events (e.g. typhoons, cyclones and socio-political unrest) created delays and challenges in the implementation of the IAs, which usually involve face-to-face data collection from a large number of households.

[3] The DEF was developed based on the lessons learned from experience in demonstrating impact as part of the IFAD9 Impact Assessment Initiative. See EB 2016/119/R.12.
[4] IFAD Management agreed to "try its best to increase the sample size [beyond 15 per cent] given the resource constraints" at the 109th session of the Evaluation Committee session held in June 2020.
[5] The sample selection requires, in compliance with the DEF, selecting at least 15 per cent of projects from the whole list of projects closing during the replenishment period (called the "IA universe"). Projects selected must have the following characteristics: (i) potential to learn lessons; (ii) feasibility of conducting a scientific rigorous IA; (iii) buy-in from the Government and IFAD; (iv) the capacity to represent IFAD's overall portfolio; and (v) relevance of the IA for subsequent project phases. Once projects meeting the criteria are listed, they are discussed with regional divisions to identify exclusion criteria, i.e. situations or characteristics that may disqualify projects from being included in the sample. These include factors such as: (i) a closing date postponed beyond 2021 (except if this occurred because there was additional funding leading to geographic expansion and the project had disbursed at least 70 per cent of its total amount); (ii) local or national conflicts preventing data collection; and (iii) a lack of government buy-in to undertake the data collection.
[6] EC/109 and EB 2019/127.
[7] Quasi-experimental IAs are defined as those for which treatment is not randomized and a robust counterfactual/comparison group (that is as similar as possible to the treatment group in terms of pre-intervention characteristics) is created using statistically robust methodologies to identify causal impact (Angrist and Pischke, 2010; White and Sabarwal, 2014).
[8] IFAD12 Results Management Framework (RMF) (IFAD12/3/R.2/Add.1).

Given these challenges, an agile strategy was needed to ensure the delivery of the current IFAD11 IA report.[9]

6. After presenting corporate impact, this report describes the building blocks: a summary of project-level findings, highlights on mainstreaming themes and lessons learned. Conclusions and next steps include recommendations for IA-related work in the future. Several annexes provide details on methodology, robustness checks, more results on mainstreaming themes and COVID-19 challenges addressed.

II. Corporate impact on Tier II development indicators

A. IFAD11 IA universe and sample

7. IFAD projects closing between 2019 and 2021 were 96 when the universe for IA sampling was identified. These projects had a total budget of about US$7.1 billion and reached around 112 million beneficiaries.[10] The average beneficiary household was headed by a 50-year-old male and earned around 31 per cent of its income from crops, 14 per cent from livestock and 11 per cent from self-employment, with significant variation across regions. Households in the East and Southern Africa (ESA) and West and Central Africa (WCA) regions had the highest shares of crop and self-employment income, equal to 37 and 20 per cent, respectively. Livestock contributed around 24 per cent of income for households in the Near East, North Africa and Europe (NEN) region.

8. The Tier II development indicators require an answer to the question: "How many rural people have experienced substantial increases in income, production, market access, resilience and nutrition as a result of IFAD investments?" Table 1 provides the full set of Tier II indicators and associated targets set for IFAD11, through projects closing between 2019 and 2021.

Table 1
IFAD11 Tier II development impact indicators and IFAD11 targets

Goal / strategic objective (SO)	*RMF indicator*	*Definition*	*IFAD11 target (million people)*
Goal	2.1.1	Number of people with increased income (at least by 10%)	44
SO1	2.1.2	Number of people with improved production (at least by 20%)	47
SO2	2.1.3	Number of people with improved market access (at least by 20%)	46
SO3	2.1.4	Number of people with greater resilience (at least by 20%)	24
Mainstreaming goal	2.1.5	Number of people with improved nutrition (at least by 10%)	12

Source: Report of the Consultation on the Eleventh Replenishment of IFAD's Resources.

9. The achievement of targets is measured through the aggregation of estimated project impacts, which are then extrapolated to the IA universe portfolio. The first step is to measure the individual impact of the 24 investments/projects listed in table 2. The second step consists of aggregating the impact of these projects to estimate an average effect size using meta-analysis. The third step extrapolates this average impact to the number of IFAD beneficiaries, out of the total of 112 million beneficiaries considered, to measure the number that experienced improvements in each indicator by at least the specified threshold reported in table 1. For example, to measure achievement of the IFAD goal, IAs and meta-analysis will indicate how many beneficiaries increased their income by at least 10 per cent

[9] See annex IV for details on the COVID-19 challenges addressed.
[10] Cofinancing for these projects amounts to US$4 billion.

as a result of IFAD investments (including cofinancing). Annex I contains details of the methodology for sample selection, aggregation and projection.

Table 2
Projects in the IFAD11 IA sample by region

#	Region	Country	Project full name	Project acronym	Approved financing (US$ million)
1	APR [a]	India	Post-Tsunami Sustainable Livelihoods Programme for the Coastal Communities of Tamil Nadu	PTSLP	91.5
2	APR	Pakistan	Southern Punjab Poverty Alleviation Project	SPPAP	123.5
3	APR	Papua New Guinea	Productive Partnerships in Agriculture Project	PPAP	68.2
4	APR	Philippines	Second Cordillera Highland Agricultural Resource Management Project	CHARMP II	76.8
5	APR	Solomon Islands	Rural Development Programme - Phase II	RDP II	62.5
6	ESA	Ethiopia	Rural Financial Intermediation Programme II	RUFIP II	248.0
7	ESA	Kenya	Upper Tana Catchment Natural Resource Management Project	UTaNRMP	82.4
8	ESA	Lesotho	Smallholder Agriculture Development Project	SADP	22.9
9	ESA	Malawi	Sustainable Agricultural Production Programme	SAPP	66.9
10	ESA	Mozambique	Pro-Poor Value Chain Development Project in the Maputo and Limpopo Corridors	PROSUL	44.9
11	ESA	United Republic of Tanzania	Marketing Infrastructure, Value Addition and Rural Finance Support Programme	MIVARF	169.5
12	ESA	Zambia	Smallholder Productivity Promotion Programme	S3P	48.2
13	LAC [b]	Argentina	Inclusive Rural Development Programme	PRODERI	149.5
14	LAC	Bolivia (Plurinational State of)	Economic Inclusion Programme for Families and Rural Communities in the Territory of the Plurinational State of Bolivia	ACCESOS	55.6
15	LAC	Nicaragua	Adapting to Markets and Climate Change Project	NICADAPTA	37.1
16	LAC	Peru	Strengthening Local Development in the Highlands and High Rainforest Areas Project	PSSA	36.5
17	NEN	Djibouti	Programme to Reduce Vulnerability in Coastal Fishing Areas	PRAREV-PECHE	13.3
18	NEN	Kyrgyzstan	Livestock and Market Development Programme II	LMDP II	39.5
19	NEN	Tajikistan	Livestock and Pasture Development Project II	LPDP II	24.2
20	NEN	Tunisia	Agropastoral Development and Local Initiatives Promotion Programme in the South-East - Phase II	PRODESUD II	52.0
21	WCA	Ghana	Rural Enterprises Programme	REP	225.1
22	WCA	Mali	Rural Microfinance Programme	PMR	42.1
23	WCA	Mauritania	Poverty Reduction Project in Aftout South and Karakoro - Phase II	PASK II	28.9
24	WCA	Nigeria	Value Chain Development Programme	VCDP	244.9
Total financing					**2 054.0**
Total IFAD financing for 24 projects					**1 090.0**
Total cofinancing for 24 projects					**964.0**

Note: The IAs in Ethiopia and Mozambique use project endline data collected before the COVID-19 pandemic by the project management unit, and therefore do not include all standard indicators as datasets collected by the Research and Impact Assessment Division.

[a] Asia and the Pacific.

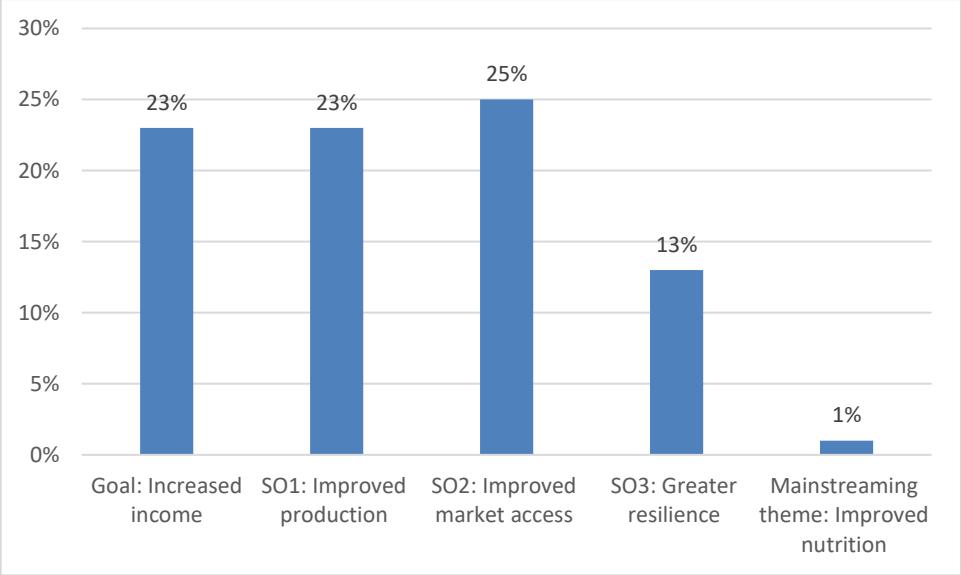
[b] Latin America and the Caribbean.

B. Results of aggregation and projection to IFAD portfolio

10. Figure 1 presents the results from the first two steps, that is the aggregation through meta-analysis, and shows the average effect size for each RMF indicator. The meta-analysis is done on the estimated impact of the 24 projects included in the sample. Results indicate that the income of IFAD beneficiaries (IFAD goal) is, on average, 23 per cent higher than it would have been if IFAD investments had not been made. This translates into a US$225 increase in income per person, adding up to a total benefit of US$25.2 billion for all 96 projects in the universe that targeted 112 million people.

11. The gains in productive capacity under SO1 from the aggregated results amount to 23 per cent, while gains in market access (SO2) reached 25 per cent. At the same time, IFAD beneficiaries are 13 per cent more resilient than their comparators as indicated by their ability to recover from shocks. As for the nutrition indicator, the average effect size is only 1 per cent, which is not surprising considering that the projects assessed were designed before nutrition became a mainstreaming theme and because changes in nutrition require time.[11] To give a more complete picture of the food dimension of livelihoods, although not an RMF target, impacts on food security are also analysed and reported, showing an average 11 per cent improvement.[12]

Figure 1
Average impact by RMF indicator



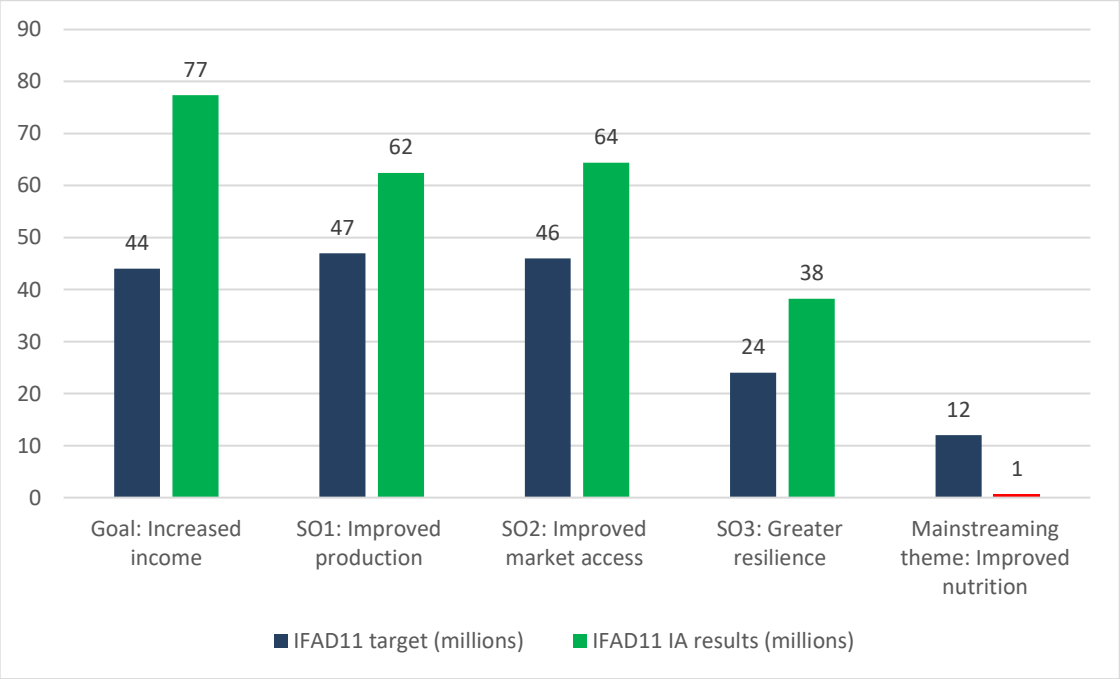
12. Using the distribution of the average impact for each indicator, and the total number of IFAD beneficiaries of the 96 projects, the results were projected to estimate the number of beneficiaries that achieved the target set in the RMF (table 1). The results of the projection are presented in figure 2 and show that for the 96 projects that closed during the IFAD11 period, IFAD exceeded all the targets set in the RMF, except for the nutrition target.

13. Regarding IFAD's overarching goal, these investments collectively improved the incomes of 77.4 million beneficiaries by at least 10 per cent, against the total

[11] Nutrition became a mainstreaming goal for IFAD in 2019, while the projects in the IFAD11 IA sample and universe were all designed long before. In a retrofitting exercise, only one project in the IA sample was defined as "nutrition sensitive," and only four projects were defined as such in the IFAD11 universe. Therefore, the findings on nutrition in the rest of this report need to be interpreted accounting for this caveat.
[12] Food security is measured using the Sustainable Development Goal (SDG) indicator 2.1.2 known as the Food Insecurity Experience Scale.

target of 44 million[13] (for three years). The productive capacities (SO1) of 62.4 million beneficiaries were improved against the target of 47 million, and the market access (SO2) of 64.4 million beneficiaries increased against a target of 46 million – in both cases, by at least 20 per cent. Around 38 million beneficiaries have seen their resilience (SO3) improve by at least 20 per cent.[14] Given the very limited average impact on nutrition, the target of 12 million people with improved dietary diversity (of 10 per cent or more) is the only target not met during IFAD11. To give a more complete picture of the food dimension within beneficiaries' livelihoods, the SDG indicator of the Food Insecurity Experience Scale (FIES) was used to measure impact on food security, resulting in 57 million beneficiaries being 11 per cent more food secure than non-beneficiaries.[15] This finding is directly linked to IFAD's contribution to the SDGs and suggests that achieving improved nutrition requires different and more dedicated interventions to complement IFAD projects that already improve food security.

Figure 2
IFAD11 RMF targets and IFAD11 IA results: Number of beneficiaries above RMF target



C. Summary of project-level findings

14. The corporate results above come from the aggregation and extrapolation of project-specific achievements reported in table 2, which provides a summary of the 24 project IA results for each Tier II development indicator. The number of plus (+)/minus (-) signs in each cell indicates the strength of the statistically significant impact. For example, a single plus sign indicates that the impact is between 0 and 25 per cent (slightly positive compared to the control group), two plus signs mean positive impact between 25 and 50 per cent, and three plus signs show a very positive impact above 50 per cent. Minus signs indicate a negative impact within the same thresholds. Zero (0) means that the estimated impact was not

[13] It is important to note that impact assessment results are also used to set future targets and ambitions for IFAD and to assess progress towards them, including the target of achieving 40 million people with higher incomes per year by 2030.
[14] When a 10 per cent threshold is used, 64 million people had higher resilience compared to the control group after exposure to shocks.
[15] The results presented above are robust to smaller sample sizes and different questionnaire types, as illustrated in the simulation-based sensitivity analysis presented in annex II.

significantly different from a statistical standpoint from the comparison group, and N.A. means the indicator was not available in the data set.

Table 2
Magnitude of impact of the IFAD11 projects evaluated[16]

Region	*Country*	*Project acronym*	*Goal: Increased income*	*SO1: Improved production*	*SO2: Improved market access*	*SO3: Greater resilience*	*Improved nutrition*
APR	India	PTSLP	+++	0	+++	0	0
	Pakistan	SPPAP - Livestock	+++	+++	+++	+++	0
	Pakistan	SPPAP - Training	0	0	0	++	+
	Papua New Guinea	PPAP	+++	+++	++	++	+
	Philippines	CHARMP II	++	+++	0	0	0
	Solomon Islands	RDP II	0	+	++	++	+
ESA	Ethiopia	RUFIP II	++	+++	+	+	+
	Kenya	UTaNRMP	+++	+	+++	+++	+
	Lesotho	SADP	0	++	0	+	0
	Malawi	SAPP	++	+	0	0	0
	Mozambique	PROSUL	++	++	+++	N.A.	N.A.
	United Republic of Tanzania	MIVARF	+	++	+	0	+
	Zambia	S3P	++	0	++	+	+
LAC	Argentina	PRODERI	+	+++	0	0	0
	Bolivia (Plurinational State of)	ACCESOS	+	0	0	0	0
	Nicaragua	NICADAPTA	0	0	0	0	0
	Peru	PSSA	+	+++	+	0	+
NEN	Djibouti	PRAREV-PECHE	0	0	0	N.A.	-
	Kyrgyzstan	LMDP II	+++	+++	+++	0	0
	Tajikistan	LPDPII	+++	++	0	0	0
	Tunisia	PRODESUD II	+++	+++	+++	0	-
WCA	Ghana	REP	+++	+++	0	0	+
	Mali	PMR	0	0	0	0	0
	Mauritania	PASK II	0	0	0	++	0
	Nigeria	VCDP	-	0	+	0	0

Note:
(1) The signs in the table refer to the magnitude of estimated impact that is statistically significant:

+++ (---) = very positive (negative) impact, >50 per cent;
++ (--) = positive (negative) impact, >25 per cent and <50 per cent;
+ (-) = slightly positive (negative) impact, <25 per cent;
0 = impact is not statistically significant; and N.A. = indicator not available.

(2) The SPPAP project in Pakistan had two very distinct components, hence two sets of impact were estimated using different sampling frames.

[16] It is important to note that meta-analysis results are not simple averages of results presented in this table but take into account the statistical precision with which they are estimated as well as sample sizes. Therefore, the average effect size estimated by this method can differ in magnitude and precision to what simple averages may suggest. Note also that, in addition to the standard indicators for IFAD's SOs and economic goal in this table, the IA reports include a rich set of impact estimates for each project's specific theory of change that will be available on the IFAD11 dedicated microsite.

15. Although the RMF considers dietary diversity as the only indicator of nutrition, this report also includes impact on food security to provide a more complete picture and complement nutrition findings.[17]

16. **Goal – Increased income.** The majority of the projects had a significant positive impact on IFAD's goal of increasing incomes. Income indicators varied based on each project's theory of change and measure crop, livestock, fisheries or enterprise income for sector-specific projects, and overall income for projects without a sector-specific focus. Beneficiary incomes were at least 25 per cent higher than they would have been without IFAD projects in 13 projects. Income gains were particularly large in India, Kyrgyzstan, Pakistan,[18] Papua New Guinea and Tajikistan – with all but Papua New Guinea focusing on livestock and fisheries. Estimated impacts on income were not significantly different between beneficiaries and the comparison group in seven projects.

17. **SO1 – Improved production.** The indicators of productive capacity include: yields or value of crops produced for agriculture-focused projects, value of livestock and fish production for livestock and fish projects, or value of production coming from household enterprises for credit and enterprise projects. Estimated impacts indicate that for 13 projects, the productivity of beneficiaries was at least 25 per cent higher than it would have been without IFAD projects, while for three projects the increase was less than 25 per cent and in nine projects was not significantly higher for beneficiaries than the comparison group.

18. **SO2 – Improved market access.** The value of the beneficiaries' marketed products – crop, livestock, fish or products from household enterprises – was at least 25 per cent higher in nine projects, and between zero and 25 per cent higher in four projects. Gains in market access were particularly large in Kyrgyzstan, Pakistan[19] and Tunisia, which were all livestock projects. Impacts on market access were not significantly higher for beneficiaries than the comparison group in 12 projects.

19. **SO3 – Greater resilience.** The indicator for resilience captures households' ability to recover from any shocks they dealt with during the project or reference period. IFAD beneficiaries were at least 25 per cent more likely to report having recovered from shocks in six projects. The impact was between 0 and 25 per cent in three projects, while in 14 projects shocked beneficiaries did not become significantly more resilient than comparable shocked households. Note that this indicator is defined only for those who report having suffered from shocks. To the extent that beneficiaries are less likely to perceive and report shocks, these estimates represent a lower bound.

20. **Improved nutrition.** IFAD11 targets in the RMF include the nutrition indicator (dietary diversity), which became a mainstreaming theme for IFAD in 2019. All projects in the IA sample were designed from three to 12 years before 2019 and therefore did not necessarily include nutrition-specific components. Estimated impacts found that Household Dietary Diversity Scores were a slight 2 to 12 per cent higher for IFAD beneficiaries in nine projects, while they were no different in 13 projects and had decreased in two projects.

21. **Food security.** Impacts on food security are stronger than the nutrition results. Four projects improved the food security of their beneficiaries by at least 25 per cent and eight projects improved it by up to 25 per cent.

[17] Measuring food security is very complex given multiple dimensions that define it: availability, access, utilization and stability (Jones et al., 2013). Therefore, complementary indicators are used to capture various dimensions (Vaitla et al., 2017). The Household Dietary Diversity Score serves as a good proxy for dietary quality, while FIES captures availability and access.
[18] Livestock subproject.
[19] Livestock subproject.

III. Highlights on mainstreaming themes

22. In addition to nutrition, IFAD11 IAs have made progress towards systematically measuring and assessing impact on two other mainstreaming themes: women's empowerment and climate change. Highlights are presented below, with detailed results and narrative reported in annex III.

23. **Women's empowerment.** IFAD11 IAs used a number of women's empowerment indicators including decision-making power on income sources (either by women only or jointly with men) and ownership of assets (e.g. land, livestock and other assets). Results from the meta-analysis show that women in beneficiary households have 27 per cent more decision-making power than women in comparison households. This result is driven by the increase in the amount of resources on which they make decisions solely or jointly with men. Impact on asset ownership indicators is negligible, indicating that more targeted efforts related to asset accumulation are needed to create impact on this front. IFAD's contribution to women's empowerment is a first necessary step towards gender transformative results and will likely contribute to increased asset ownership in the future.[20]

24. **Climate change.** IFAD has also started documenting evidence on climate change adaptation more systematically. Taking a close look at six Adaptation for Smallholder Agriculture Programme (ASAP) projects,[21] the rate of adoption of adaptation options promoted by each project has been assessed. Given the context specificity of adaptation, the analysis carefully studied the context and the adaptation options promoted by each project using a tool to distil the right indicator for the specific options promoted. Results show that adoption rates are systematically higher for beneficiaries compared to the control group, ranging from 7 percentage points in the Plurinational State of Bolivia to 69 percentage points in Kyrgyzstan (for the most widely adopted practice in each project).

IV. Lessons learned

25. Four overall lessons have been drawn from the IFAD11 IAs by distilling findings on what worked and what did not, which are reported for each project in appendix I.

A. Invest in value chains, and specifically in agricultural midstreams, to maximize benefits

26. Although most projects increased production in the specific sector they focused on (e.g. crops, livestock, fisheries or enterprise), they had limited impact on total income. This may be attributable to a substitution effect for one sector to another, but also because they were unable to monetize increased production through market sales or the increase in production was not enough to create a marketable surplus. In order to achieve the longer-term goal of sustainably increased incomes, projects need to link farmers to the market and invest in the midstream of the agrifood value chains to ensure impacts on production translate into increased incomes. This is also suggested by a large body of evidence that stresses the importance of the "hidden middle" (processors, wholesalers and wholesale markets, and logistics) for rural transformation.

B. Strengthening resilience requires designs that address chronic and acute shocks

[20] See Report on IFAD's Development Effectiveness 2022 (EB 2022/136/R.7) for more details on gender; see also the Mainstreaming Gender-transformative Approaches at IFAD – Action Plan 2019-2025 (EB 2019/126/INF.6).
[21] ASAP is IFAD's flagship programme for channeling climate and environmental finance to smallholder farmers. It was launched by IFAD in 2012 to make climate and environmental finance work for smallholder farmers. The six ASAP projects in the IA sample are in the Plurinational State of Bolivia, Djibouti, Kyrgyzstan, Mozambique, Nicaragua and Tajikistan.

27. A holistic and effective approach to resilience requires different sets of tools to deal with acute versus chronic shocks.[22] Given that climate change is intensifying the frequency and intensity of both, future project designs need to combine new and innovative tools to prevent, manage and cope with locally relevant shocks. These can include adaptation strategies for chronic shocks, such as building assets, adopting new and more adaptive varieties for shorter or later rainy seasons, versus acute and more extreme shocks, such as typhoons, hurricanes or droughts, which require coping strategies that may include social safety nets, insurance, savings and access to credit.

C. Food security does not necessarily translate into improved nutrition

28. The projects included in the IFAD11 IAs lasted an average of eight years and were designed between three and 12 years before nutrition became a mainstreaming theme. This report showed that while food security was improved, achieving necessary behavioural changes to improve nutrition is challenging without a dedicated theory of change. The project components that can deliver the needed change include investments in nutritional education and training, market incentives (e.g. labelling and traceability) and interventions to influence consumer preferences (including regulatory frameworks), as long as components are interlinked and embedded in the overall theory of change. In terms of recommendations to design new projects, it would be ideal to strengthen a project's theory of change by integrating nutritional education and behavioural change supported by market- and community-driven approaches.

D. Decision-making power for women is a first step towards transformative change

29. Women's empowerment includes multiple dimensions. One step is increasing women's decision-making power (solely or jointly with men) regarding livelihood sources, and IFAD has done well in this regard. IFAD's contribution to women's decision-making power is a necessary step towards gender transformative results that can only be achieved through approaches that include the whole society to catalyse change in social norms. Asset ownership is another important step that requires a conscious effort. All these elements are part of the gender action plan within the mainstreaming effort IFAD that has been making in project designs since 2019.

V. Conclusions and next steps

30. Conducting systematic IAs is a key step in the process of enhancing development effectiveness. At the corporate level, these IAs help measure progress and achievements both within each replenishment period and towards IFAD's goal of doubling impact by 2030. They also inform the progress achieved and the remaining challenges to fulfil ambitions and, perhaps, to reconsider initial targets. At the project level, they document successes and areas of improvement for each project, as well as the mechanisms through which impacts are achieved.

31. IAs provide an opportunity to collect detailed, multi-topic, large household and community level data on IFAD's beneficiaries and a comparison group. Created along the lines of the World Bank Living Standards Measurement Studies, the IFAD IA surveys collect comprehensive and diverse socio-economic data on people's livelihoods. For IFAD11 IAs, data from more than 40,000 households have been harmonized and anonymized, and can be shared upon request. They are currently

[22] "Acute shocks include seismic events, periodic heatwaves, droughts and flooding. Chronic stresses – in particular those associated with climate change – build up in the longer term, increasing the frequency of acute shocks and creating their own chronic problems, such as sea-level rise," Collier P., et al. (2018), Embedding Resilience: City responses to acute shocks and chronic stress. United Nations Human Settlements Programme.

stored in the Food and Agriculture Organization of the United Nations microdata catalogue.[23] Plans call for them to be moved to IFAD platforms during the IFAD13 period to enable real-time data analyses.

32. Accountability and learning are two pillars of IFAD IAs. The evidence they bring forward informs the design of new projects, and provides a public good for policymakers. Results of each IA are fed into project completion reports and disseminated through validation meetings held at country and regional levels. Lessons learned from each project and overall are being embedded into the Operational Results Management System to facilitate their use in the design of new projects and country strategies.

33. During IFAD11, IFAD exceeded all its RMF targets on its goal and SOs except for nutrition. These achievements have also made a clear contribution to the 2030 Agenda, not only to SDG 1 (no poverty) and SDG 2 (zero hunger), which are at the core of IFAD's mandate, but also to SDG 5 (gender equality) and SDG 13 (climate action), among other interconnected SDGs.

34. Looking ahead, IFAD will strengthen transparency and credibility by making data and analysis details available on IFAD platforms to facilitate replicability and further research. Efforts to further strengthen the robustness of the methodology and dissemination of evidence will continue.

35. It is also anticipated that IFAD will start doing scientific implementation trials to measure the efficacy and implementation fidelity of adoption-related investments to then inform whether and how they can be scaled up. These will include nascent innovations that require small-scale trials and others that are field tested but have not necessarily been tested for implementation, e.g. those resulting from the Innovation Challenge or the Agricultural Research for Development Programme.

36. Ex ante IAs will facilitate learning for a new generation of IFAD projects, particularly those that involve new processes and products, which cannot be done using ex post design given the average project length of eight years. IAs will also be conducted in the future to respond to demands from supplementary funding sources such as the Green Climate Fund, Global Environment Facility and Adaptation Fund. In this case, budgetary provision will have to be made for these rapid trials from programmatic or administrative sources.

37. Existing rich evidence from IAs will be used to feed into more systematic reviews to facilitate learning and support evidence-based decision-making on thematic areas to support project and country strategic opportunities programme designs. Synergies with the 50x2030 Initiative as well as streamlined core outcome indicator surveys can support the implementation of IAs once a critical mass of data become available.

[23] IFAD impact assessment surveys (fao.org).

Methodology: sample selection, aggregation and projection

A. Sample selection

1. The sample for the IFAD11 IA is composed of 24 projects, corresponding to 25 per cent of the universe of 96 projects that closed between 2019 and 2021. In an effort to undertake the due diligence recommended by the Executive Board at its 127th session held in September 2019 and by the Evaluation Committee at its 109th session held in June 2020, sensitivity analyses were carried out to determine whether the projects selected for IAs were different from the universe, i.e. to assess whether there was a potential for bias due to systematic differences along observable variables (all available project ratings and objective characteristics) between the IA sample and other projects in the universe.

2. The results, presented in table 1 show the average values of project design ratings and relevant project characteristics for the IA sample and the rest of the projects in the universe, along with the results of tests of statistical significance of the differences between the two. Results show no significant differences between the sample and the rest of the projects in 30 of the 31 dimensions tested. The only difference observed was the rating on "performance of monitoring and evaluation (M&E) system" where the sample had an average performance rating of 4, slightly higher than the 3.7 average of the remaining projects in the IFAD11 IA universe. This rating assesses whether the M&E system has produced adequate and reliable information to monitor implementation performance and to measure outcomes and impact. Note that the ratings used in the table are the ratings available at the time of sample selection (first rating at project design stage). However, as the projects are implemented and issues addressed, performance ratings tend to improve. The reported difference does, indeed, disappear when last ratings available are used, ruling out the possibility that projects with better M&E systems were selected in the IA sample.

Table 1
Tests of differences between 72 non-IA and 24 IA project ratings and characteristics

Variable	*Non-IA average* [a]	*Number* [b]	*IA average* [c]	*Number* [d]	*p-score* [e]
First ratings					
Assessment of the overall implementation	3.93	72	4.00	24	0.45
Likelihood of achieving the development goals	4.01	72	4.08	24	0.44
Par value	0.11	72	0.08	24	0.69
Effectiveness	3.93	61	3.95	22	0.86
Targeting and outreach	4.08	72	4.13	24	0.68
Gender equality and women's participation	4.03	72	4.04	24	0.88
Agricultural productivity	3.95	64	4.05	21	0.29
Adaptation to climate change	4.06	36	4.09	11	0.73
Institutions and policy engagement	4.00	65	4.00	22	1.00
Human and social capital and empowerment	4.05	65	4.00	22	0.57
Quality of project target group	4.07	72	4.08	24	0.88
Responsiveness of service providers	3.94	72	4.04	24	0.27
Environment and natural resources	4.00	38	4.10	10	0.37
Exit strategy	4.02	48	3.92	13	0.27
Potential for scaling up	4.03	63	4.09	22	0.62
Quality of project management	3.97	72	4.04	24	0.59
Knowledge management	3.98	66	4.05	22	0.50

Coherence between annual workplan and budget and implementing agency	3.78	68	3.96	24	0.13
Performance of M&E system	3.74	72	4.04	24	0.00
Acceptable disbursement rate	3.10	72	2.79	24	0.45
Quality of financial management	3.97	68	4.00	24	0.78
Quality and timeliness of audit	3.92	72	4.00	24	0.28
Counterparts funds	3.94	72	4.17	24	0.19
Compliance with loan covenants	3.94	72	4.08	24	0.30
Procurement	3.93	72	3.92	24	0.93
Project characteristics					
Actual beneficiaries	686 674	71	2 629 989	24	0.31
Total funds per person (US$)	1 082	71	298	24	0.11
IFAD funds per person (US$)	471	70	111	24	0.10
Total approved financing (All sources)	71 166 361	71	85 586 933	24	0.42
Total approved IFAD financing	29 223 084	70	45 428 488	24	0.11
IFAD percentage in approved financing	52	70	56	24	0.46

[a] Average ratings/values for the projects in the portfolio that are not in the IA sample,

[b] Number of non-IA projects that have ratings available,

[c] Average ratings for the IFAD11 IA sample and

[d] Number of projects in the IFAD11 IA sample.

[e] A p-score greater than 0.05 indicates that the difference between the values is not statistically significant, i.e. the two groups are similar on average.

3. This analysis leads to the conclusion that there are no systematic differences between the projects in the sample and the remaining projects in the IFAD11 IA universe. In other words, projects selected for an IA are not better or worse on average than unselected projects, which rules out the existence of ex ante selection bias.

4. The potential for sample selection bias was one of the main concerns raised by the Executive Board following the IFAD10 IA presentation. In response, the impact assessment team conducted and presented a series of statistical sensitivity analyses to the Evaluation Committee in May 2020 for the IFAD10 sample.[24] One method used was Heckman correction for sample selection. The Heckman procedure requires observable variables that can predict selection as well as a number of assumptions that need to be met to be useful in bias correction.[25] None of the observable variables are significant in predicting selection for the IFAD11 sample. Also, the inverse Mills ratio procedure indicates that no selection bias is present in the IFAD11 sample. Additional sensitivity and robustness analyses were also conducted and are presented in annex II.

B. Aggregation

5. The first step of IFAD's methodology for estimating aggregate development effectiveness involves a meta-analysis of individual project impact estimates combined to compute aggregate corporate impacts. Meta-analysis is a statistical procedure for combining data from multiple studies, or in the specific case of IFAD, project impact estimates. Meta-analysis can be defined as a synthesis of results or "the statistical analysis of a large collection of results for the purpose of integrating

[24] EC 2020/109/W.P.4.
[25] Wolfords S. E. and Siegel, J., "Misaccounting for endogeneity: The peril of relying on the Heckman two-step method without a valid instrument," *Strategic Management Journal* 2019, no. 40 (2017): 432–462.

the findings".[26] In other words, it is "a quantitative summary of statistical indicators reported in similar empirical studies".[27]

6. Meta-analysis outcomes are treatment effects (mean effect sizes) representing the impact of IFAD's projects. Once combined, aggregate and attributable impacts are reported as percentage changes over counterfactual (i.e. comparison) groups for each RMF Tier II development impact indicator for the impact analysis sample. Since there are no systematic differences between the IA sample and the IA universe, the mean effect size from the meta-analysis is projected to the entire amount of IFAD investments. Overall impact can therefore be attributed to IFAD interventions given the use of rigorous counterfactuals in project IAs.

7. The mean effect sizes from the meta-analysis of findings from the 24 IAs were validated by replicating the analysis using the pooled household level data. The team estimated impact on main indicators using this pooled household data including country/project fixed effects.[28] The results are available on the IFAD11 IA microsite. The data, programmes and other details of the computations sufficient to permit replication are encrypted, anonymized and stored in IFAD xdesk. Data are available upon request, supported by a brief explanation of how the data will be used.

C. Projection

8. The projection exercise is conducted to extrapolate the mean effect sizes resulting from the meta-analysis to the whole universe of 96 IFAD11 IA projects to estimate the total number of people benefiting from investments. The projection requires determining the number of actual beneficiaries reached across the whole universe of eligible investments. This totalled 112 million beneficiaries for all projects in the IFAD11 IA universe and these are extracted from IFAD's internal reporting mechanism: the Operational Results Management System. The total number of beneficiaries impacted for each outcome is then calculated based on this number.

9. The projection relies on an important assumption concerning the distribution of impacts resulting from the meta-analysis. It is assumed that estimated impacts are normally distributed across the entire population of beneficiaries with the same means and standard deviations of empirically estimated impacts. Since the population is large, this is not a constraining assumption. Given the distribution, the calculation of the number of people that have benefited from IFAD interventions during this period is determined by the number of beneficiaries in the distribution that exceed the threshold set in the RMF for each of the Tier II development indicators (table 1 of main report). The threshold is set at: 10 per cent for income; 20 per cent for productive capacities, market access and resilience; and 10 per cent for nutrition. Using estimated aggregate impacts and the total number of beneficiaries in the universe allows for the calculation of the number of people benefiting above each threshold for these indicators.

10. In summary, the total number of beneficiaries who have achieved results above the target set in the RMF is obtained by: (i) randomly drawing a normal distribution of impacts (with the mean and standard deviation estimated from the meta-analysis) for 112 million people; and (ii) counting the number of people who have experienced an increase that exceeds the threshold set for the corresponding outcome (i.e. RMF indicator).

[26] Glass, G., "Primary, Secondary, and Meta-Analysis of Research," *Educational Researcher*, 5, no. 10 (1976): 3–8.
[27] Brander L.M., et al., "The recreational value of coral reefs: A meta-analysis," *Ecological Economics*, 63, no. 1, (2007): 209–218.
[28] As the literature shows, a better way to tackle the potential systematic differences between a sample and the population from which it has been drawn is to merge all the micro-level data together and run a pooled analysis that also includes country/project fixed effects. That is, once the household data from each project have been combined, one can exploit the between-project variability and control for country/project-specific unobservable characteristics, thus improving the external validity of the overall meta-analysis.

D. Caveats, learnings and next steps

11. **Random sampling.** One of the main inputs received during IFAD10 IAs concerned the sample selected using the approved set of criteria defined in the Development Effectiveness Framework.[29] In IFAD12 a stratified random sampling by region is used to identify projects that will undergo IAs during the IFAD12 exercise, which will include projects that are closing between 2022 and 2024 while still assessing them for the criteria that were used in IFAD11. Furthermore, the protocol also includes "replacement projects" that have been randomly drawn in case the first draws are not successful.

12. **Sensitivity.** Following the input received on the IFAD10 IA report, IFAD conducted systematic sensitivity analyses. These included the tests of potential selection bias and other tests to assess the robustness of the corporate impact estimates. These are presented in paragraph 4 and rule out any systematic bias. Sensitivity analyses have also been conducted to test robustness to sample size and questionnaire type. Simulations of sample sizes corresponding to 15 per cent and 20 per cent of the portfolio selected using random and stratified random selection were also conducted. Regarding questionnaire type, corporate impacts have been calculated systematically excluding results from lighter questionnaires, and the results are presented in annex II.

13. **Heterogeneity.** The average impacts and projections presented in this report refer to the whole IFAD11 IA universe. Given the sample size and strategy, potential heterogeneities of impact by region, country income categories or sector of intervention cannot be estimated separately. To be statistically meaningful, such an exercise would require much larger samples that are representative along multiple dimensions.[30]

14. **Ex ante versus ex post.** The IAs are based on an ex post quasi-experimental design. This means the data are collected at the end of the project from both beneficiaries and a carefully identified comparison group. Whereas ex ante IAs would allow for the use of experimental or quasi-experimental design, such as randomized control trials or difference-in-difference estimates, IFAD IAs use ex post quasi-experimental designs to meet the corporate reporting needs within budget and time constraints. To ensure scientific rigour in ex post IAs, each sample ensures that the comparison group is as similar as possible to the beneficiaries at the start of the project. This is done in various steps.

15. First, the universe of potential comparison sites is identified through a careful analysis of eligibility and targeting criteria for the project. Then, once the universe is identified, beneficiary and comparison communities are matched, using data that capture their characteristics before the project. This can include, for example, geo-referenced data on agroecological and climatic conditions, and sociodemographic data from national censuses on income, production and poverty. The geographic matching is then validated with local experts and key informants. All households that meet the selection criteria in selected comparison communities are listed in a sampling frame and a full list of beneficiary households is obtained from the project management units. Finally, the households for the IA surveys are randomly selected within selected communities. Once the household data are collected, another matching at the household level ensures that the final sample used for analysis is comprised of beneficiaries and a reliable comparison group representing the counterfactual.

[29] EB 2016/119/R.12.
[30] Additional meta-regression analyses have been conducted to assess the relative effect sizes for selected categories, and are available upon request.

Robustness checks

1. This annex presents the results of a set of exercises aimed at testing the robustness of the main findings to changes in sample size and the type of questionnaire used to collect data.

2. First, a reverse power calculation was conducted to investigate the minimum sample size needed to capture the anticipated effect of at least a 10 per cent increase in income in the IFAD11 IA universe. To do this, the methodology developed by Valentine et al. (2010)[31] is used in the context of meta-analyses with random-effect models. In addition to the expected effect size, the calculation requires a number of parameters, including the degree of heterogeneity among the projects, the expected statistical power and the average number of observations per project. A high degree of heterogeneity is set (h=3), along with a statistical power of 0.995, which corresponds to a statistical level of 1 per cent in a two-tailed test. The minimum sample size is calculated using the average number of observations per project (equal to 1,900 for IFAD11 IAs). The results indicate that the minimum number of IAs needed to detect the targeted impact should be 17, fewer than the 24 IAs conducted for IFAD11.

3. IFAD's commitment to conduct IAs on at least 15 per cent of the portfolio of projects closing during each replenishment period was significantly exceeded in the current analysis, with a sample of 24 projects representing 25 per cent of the portfolio. This creates a unique opportunity to enable a robustness test to determine whether smaller sample sizes would have given similar results to better set future IA sample targets.

4. This test is operationalized by drawing a random sample (without replacement) of projects out of the 24 corresponding to 15 per cent and 20 per cent of the portfolio: 14 and 19 projects, respectively. Three separate exercises were conducted to check robustness: (i) a meta-analysis and the projection on a sample built by randomly drawing 14 and 19 projects from the IA sample of 24 projects; (ii) a regional stratification is imposed in this sample, to keep the original regional distribution; and (iii) a meta-analysis on the average coefficients obtained from a Monte Carlo simulation involving a 100-fold repetition of the random sampling approach of the first exercise.

5. Table 1 reports the results on the economic mobility indicator from this test and shows that both the effect sizes and the projections remain consistent with the results reported in the main part of this report. Specifically, the effect size varies between 23 per cent and 28 per cent when a random sample of 14 projects are selected (15 per cent of the portfolio), while this variation almost disappears with a random sample of 19 projects (20 per cent of the portfolio). Both of these results are in line with the average effect size on economic mobility of 23 per cent reported in the core part of this report. Note that the 95 per cent confidence intervals of these new effect sizes largely overlap with the confidence intervals of the main effect size, suggesting that these are not statistically different. In terms of number of beneficiaries, the projection of these new effect sizes is always above the target of 44 million beneficiaries set by the RMF, and the random and regionally stratified random samples lead to estimates that are very close to the main finding in this report (77.4 million versus 76.7 or 78.7 million).

[31] Valentine, J. C., Pigott, T. D., & Rothstein, H. R., "How many studies do you need? A primer on statistical power for meta-analysis," *Journal of Educational and Behavioral Statistics* 35, no. 2 (2010): 215-247.

Table 1
Robustness to changes in sample size

Simulation results on economic mobility			
Percentage of IFAD11 portfolio:	15%	20%	25%
Number of projects in simulation:	14 projects	19 projects	24 projects
Effect sizes by type of simulation (impact on income)			
Random	28% (15-43)	23% (13-34)	23% (13-33)
Regional stratified	27% (15-40)	23% (12-35)	
Average of 100 random draws	23% (10-37)	23% (13-35)	
Projection results (million people with increased incomes)			
Random	82.1	78.7	77.4
Regional stratified	83.9	76.7	
Average of 100 random draws	108.6	110.4	

Note: the table reports the results from three different robustness checks: (i) random drawing of 14 IAs from the 24-IAs sample; (ii) random drawing of 14 IAs using a region stratified approach (3 APR; 4 ESA; 3 LAC; 2 NEN; 2 WCA); and (iii) the average effect of 100 random draws using the first approach. Results are consistent across methods and with the baseline effect size reported in the main part of the analysis.

6. Finally, it is important to recognize how the COVID-19 pandemic severely affected the process of data collection for the IFAD11 IAs. During the early phases of the pandemic, each country imposed a broad set of restrictions on the fieldwork. These included regulations on whether and how data could be collected in the field, the safety measures to be taken by the enumerators and many other aspects of the fieldwork. Due to the exceptional circumstances, the data used in IAs for this report have been collected with a set of survey instruments designed to comply with country-level restrictions. These survey instruments are broadly classified into three different categories: (i) gold standard survey instrument; (ii) IA-light survey, consisting of a shorter version of the gold standard survey, including less detailed questions;[32] and (iii) endline survey instruments, which are data directly collected by project management units and tend to have even less detail than IA-light surveys.

7. Conducting a meta-analysis using data collected with these different survey typologies may have implications for the final results. Therefore, a final robustness test has been conducted by running the meta-analysis and the projection on different samples by excluding: (i) the coefficients from projects that used endline surveys; and (ii) the coefficients from projects that used IA-light and endline surveys.

8. Table 2 displays the results on the effect size and projection for all RMF indicators. For the indicator of IFAD's goal of increased incomes, the effect size is slightly lower at 21 per cent and 19 per cent, when excluding endline surveys only and IA-light surveys plus endline surveys, respectively. Similar evidence emerges for SO1 and SO2, with an estimated decrease in the range of about 2 per cent to 3 per cent in effect sizes, which however remain positive and equal to 20 per cent (for SO1) and 23 per cent (for SO2). In contrast, for SO3 an increase in the effect size is observed when excluding endline surveys (14 per cent) and IA-light surveys plus endline surveys (19 per cent), while the effect size on the nutrition indicator remains unchanged. All of the simulated projection results are above the targets laid out in

[32] The IA-light questionnaire was prepared in partnership with the World Bank Living Standards Measurement Study team.

the RMF with the sole exception of nutrition, which is in line with the evidence presented in the main part of the analysis.

Table 2
Robustness to survey instrument

Simulation results for all indicators			
	All 24 projects	*Without endline (22 projects)*	*Without endline and IA-light surveys (17 projects)*
Effect sizes by survey type (% impact)			
Goal	23	21	19
SO1	23	21	20
SO2	25	23	23
SO3	13	14	19
Nutrition	1	1	1
Projection results (millions of people)			
Goal	77	74.5	70.6
SO1	62	57.2	56.4
SO2	64	61	62.2
SO3	38	42.6	54.6
Nutrition	0.6	0.5	1.5

Detailed results on mainstreaming themes

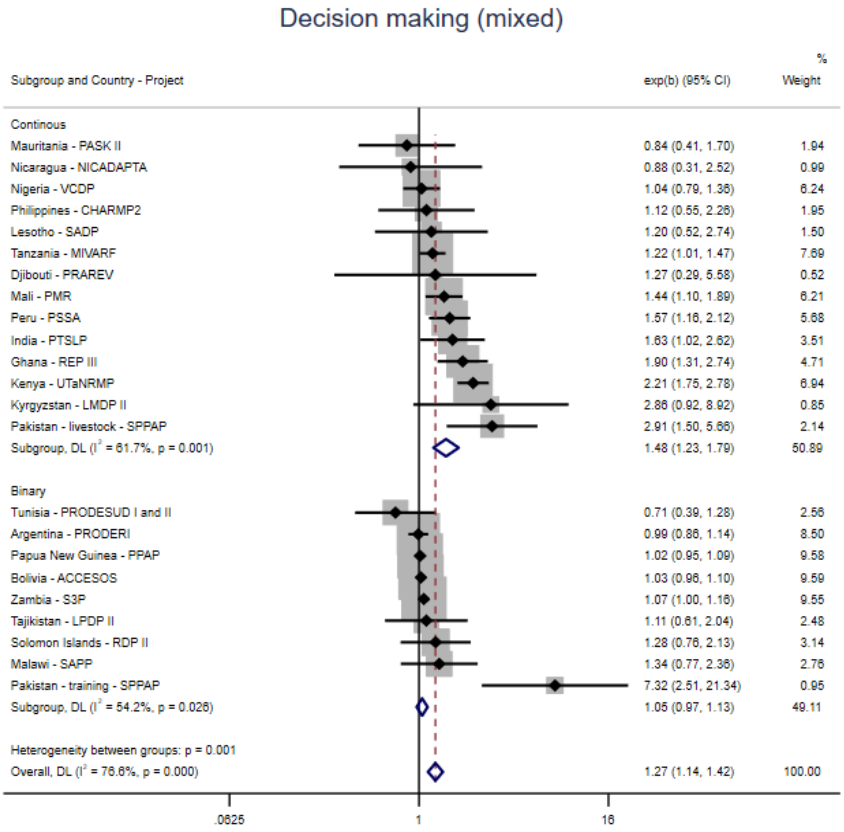
A. Women's empowerment

1. An analysis of the impact of IFAD's interventions on gender empowerment was conducted by focusing on two dimensions: women's increased decision-making power, defined as women's ability to decide on the use of resources either solely or jointly with men, and women's increased ownership of assets. To conduct this exercise, a meta-analysis on the impacts of project intervention across several proxies of these two dimensions has been carried out. Given the different dimensions on which decision-making can be exercised – e.g. income, livestock management, land use and input adoption – a protocol based on a stepwise approach is used to identify the most prominent dimension to include when an IA has reported on more than one indicator.

2. For women's decision-making, the inclusion of decision-making indicators on income has been used, followed by any other monetary source and production. A similar approach has been used for asset ownership, prioritizing indicators on women's ownership of durable assets, followed by ownership of other assets, livestock and land. Finally, in case of the availability of both sole and joint indicators, the best-case scenario between these two has been selected for both decision-making and asset ownership. This has resulted in a set of variables capturing the amount or resources controlled, and a different set capturing women's role in controlling resources.

3. As discussed in the main part of the analysis, results show that women in beneficiary households have experienced 27 per cent more decision-making power than women in comparison households. The forest plot hereby reported suggests that the result was driven by the increase in the amount of resources (continuous variables) on which women make the decisions solely or jointly with men. Again, the impact on women's ownership is negligible and not statistically significant from the control group, which may derive from the fact that asset accumulation is a long-term process. With this, it can be concluded that IFAD's interventions have laid the foundation for women's empowerment, enabling women's decision-making power, which may provide the basis for an increase in asset ownership in the future but may also require a broader and more comprehensive approach that has been embedded in IFAD's project design through the mainstreaming themes and the gender action plan.

Figure 1
Results on women's empowerment



B. Adaptation to climate change

4. IFAD's beneficiaries are both exposed to and impacted by climatic shocks and climate change, although they are not major contributors of greenhouse gas emissions. Supporting beneficiaries to adapt to climate change is a priority for IFAD's investments and has been mainstreamed in IFAD operations. The Adaptation for Smallholder Agriculture Programme[33] (ASAP) has been instrumental in driving the ambitious climate mainstreaming in IFAD's portfolio as well as in determining the current modus operandi.

5. This section briefly looks at the overall adoption rate of the most promoted adaptation options and at the impact in terms of increasing adoption for beneficiaries of ASAP-funded projects, which correspond to six of the 24 projects assessed. The adaptation strategy adopted by each household in the sample is embedded, together with geo-referenced climatic variables, within the overall analysis conducted and reported in this paper to determine key indicators of production and of resilience.

6. Climate change adaptation is a context-specific process, as are livelihood and production strategies. It is influenced and determined by the natural resource base existing in each context, by infrastructure available and by the types, intensity and frequency of risks and shocks to which different contexts are exposed. For example, the adaptation options needed in the Mekong River Delta in Viet Nam are different from those needed in the drought-prone areas of Malawi or Mauritania or to prevent the impact of erosion on steep Andean fields. As such, solutions – in terms of policy and investments – have to be context specific.

[33] The ASAP is IFAD's flagship programme for channeling climate and environmental finance to smallholder farmers. It was launched by IFAD in 2012 to make climate and environmental finance work for smallholder farmers. A multi-year and multi-donor financing window, ASAP aims to provide a new source of cofinancing to scale up and integrate climate change adaptation across IFAD's operations.

7. Given the context specificity requirement of adaptation, the analysis conducted and reported here has required that a detailed study of the context and of the adaptation options promoted be carried out for each project. These have then been organized into a screening tool where relevant indicators needed to measure the adoption have been developed for each option promoted, together with the formulation of questions to collect variables needed to construct the indicator. As a result, specific tailored questions have been included in each data collection tool for the projects under assessment.

8. Table 1, which reports for each of the six ASAP projects, analysed the main adaptation options promoted, the impact on adoption and the level of adoption for the comparison group. Generally speaking, the impact on adoption for beneficiaries is significantly higher compared to the control group. However, in many cases the adoption rate is still relatively low.

Table 1
Impacts of adopting adaptation options in ASAP projects

Country	*Project*	*Focus*	*Indicator*	*Impact (pp)*	*Counter-factual*
Bolivia (Plurinational State of)	Economic Inclusion Programme for Families and Rural Communities Territory of the Plurinational State of Bolivia	Eradicate extreme poverty, addressing adaptation to climate change	Small-scale irrigation	6*	54
			Crop residues	7**	56
			Agroforestry	4*	13
			Erosion control	7***	52
Djibouti	Programme to Reduce Vulnerability in Coastal Fishing Areas	Support people living in rural coastal areas affected by climate change to improve their resilience and reduce vulnerability	Landing stag Adoption rate for beneficiaries (%)	18	n.a.
			Cold rooms and facility Adoption rate for beneficiaries (%)	52	n.a.
			Solar fridge Adoption rate for beneficiaries (%)	29	n.a.
			Insulated cooler Adoption rate for beneficiaries (%)	7	n.a.
			Storage rooms Adoption rate for beneficiaries (%)	7	n.a.
Kyrgyzstan	Livestock and Market Development Programme II	Enhance livestock productivity and strengthen the climate resilience of pasture communities	Follow rotational plan	-37***	61
			Use remote pasture	65***	22
			Does not use winter pasture	28***	15
			Does not use spring pasture	69***	13
Mozambique	Pro-Poor Value Chain Development Project in the Maputo and Limpopo Corridors	Adaptation to climate change to increase production. Connect farmers to market and access to market	Intercropping	17***	61
			Crop rotation	27***	50
			Pest control	33***	18
			Weed management	29***	66
Nicaragua	Adapting to Markets and Climate Change Project	Adaptation to climate change to increase production. Connect farmers to market and access to market	Crop residues	-3**	96
			Shade trees	6**	73
			Water infrastructure	7**	42
			Post harvest infrastructure	63***	37
Tajikistan	Livestock and Pasture Development Project II	Enhance livestock productivity and strengthen the climate resilience of pasture communities	Tropical livestock unit (%)	-29*	3.3
			Rotational plans for pasture	52***	34
			Protected rangelands	21***	3
			Winter stalls	23***	70
			Water points	19**	20

Source: IFAD11 impact assessment reports, forthcoming.

Note: Impacts are reported in percentage point changes for all indicators except for the tropical livestock unit (Tajikistan) where the impacts are in percentages. The counterfactual values are in percentages except for the above-mentioned indicators expressed in their original continuous values. The counterfactual values represent what beneficiary households would have had if they had not benefited from the respective project. Asterisks indicate the level of statistical significance: * at 10 per cent; ** at 5 per cent; *** at 1 per cent.

9. It is important to note that in estimating impact, geo-referenced climatic variables and their long-term variations are included in the analysis. These have been used to support the design of the sampling strategy. Geo-referenced data – such as those on long-term biophysical characteristics, presence and accessibility of physical infrastructure and weather shock occurrences since project inception – have been used to help select suitable control areas to create a solid counterfactual as well as to improve and increase precision of results accounting for climate patterns that may influence project outcomes such as production and resilience. Overall, this analysis provides a good contribution to systematic evidence generated, and shows that given the overall low adoption rate, ASAP projects provide a strong determinant of increased adoption. By looking at adoption rates and project achievements, it is also possible to draw conclusions on the most suitable practice(s) according to the context analysed.

COVID-19 challenges addressed

1. The original IFAD11 IA sample was selected in June 2018, long before the COVID-19 pandemic started. The sample selection was conducted using the criteria provided in the Development Effectiveness Framework and included 24 projects (18 projects as main sample and six additional ones as reserves to ensure enough coverage in case some projects were not evaluable or dropped out for exogenous reasons).

2. At the time of selection, these 24 projects corresponded to more than one fifth (21 per cent) of the projects in IFAD's portfolio that were expected to complete by 2021. At the 109th session of the Evaluation Committee held in June 2020, Management agreed that a larger sample size would be better and that it should try its best to increase the sample size given resource constraints. The ambitious target of 24 projects for the IFAD11 IA was thus confirmed in spite of the challenges associated with COVID-19 and increasing resource constraints.

3. Since March 2020, the COVID-19 crisis has created critical challenges for the IFAD11 IA. These include:

   (i) Freezing of all field-level physical data collection activities for six to 10 months in countries in the IA sample;

   (ii) Adding an additional budgetary burden to implement data collection under COVID-19 regulations, when face-to-face data collection was officially allowed;

   (iii) Drafting requirements to shorten face-to-face interactions by shortening the survey length; and

   (iv) Extending official completion dates for some projects with implications for the universe and the selected sample for IFAD11 IAs.

4. Since the beginning of the pandemic, Management has presented multiple updates to the Evaluation Committee regarding the IFAD11 IA activities carried out during the COVID-19 outbreak. These include:

   (i) Pilot testing the feasibility of using phone surveys to finalize pending IAs;

   (ii) Consulting with the independent evaluation and self-evaluation units of major international financial institutions (IFIs)[34] to discuss their response to the pandemic and methodologies to deal with the effects on IAs;

   (iii) Developing a shorter questionnaire focused on Tier II development indicators for contexts, where travel restrictions were delaying or limiting the duration of physical data collection;

   (iv) Collaborating with project management units (PMUs) regarding the availability of high-quality data (through endline surveys) to assess their suitability for IAs; and

   (v) Reassessing the differences in project ratings and characteristics between the IA sample and the universe using statistical analyses to address the implications of subsection (iv) above.

5. Following meetings and consultations with all IFIs and a pilot test in Kenya, phone surveys were deemed unfit for purpose for targeted IAs where beneficiaries are the most isolated rural poor with limited connectivity, which constitute IFAD's main target group. This pilot, however, resulted in a phone survey instrument that can be used to collect data under emergency situations as a last resort.

[34] The World Bank, the African Development Bank, the Asian Development Bank and the Inter-American Development Bank.

6. Based on this experience and in response to the challenge of implementing long face-to-face surveys under COVID-19, the Research and Impact Assessment Division (RIA) has developed a shorter questionnaire that was applied in some countries. As a side product of these efforts, a data collection kit was developed in collaboration with the World Bank, which can be used by PMUs and country offices to collect data where local capacity is limited and the costs for implementing a full-length survey are too high. Finally, the collaboration with PMUs led to the inclusion of two new projects, where endline data had been collected with RIA input and covered treatment and control groups. These surveys do not include the full range of variables used for RIA IAs, hence they are called IA-light surveys.[35]

7. These efforts have culminated in the successful implementation and finalization of all 24 projects in the IFAD11 IA sample by March 2022, the results of which are used for corporate reporting in this document. Management has also included a set of questions on the COVID-19 pandemic in surveys that were conducted after March 2020, which led to additional knowledge products on the impact of the pandemic on IFAD's target group.

[35] The sensitivity analyses presented in annex II also include the sensitivity of results to the inclusion of the IA-light surveys as well as IAs completed using project endline data.

Project-level Impacts and Lessons Learned

Each impact assessment conducted unveils a story in itself, and adds a wealth of lessons that are being embedded within the ORMS systems to facilitate their inclusion in future project design and country strategies. A summary of results, mechanisms, successes and failures along with lessons learned is reported for all projects analysed.

Country & Project	Results	Lessons/recommendations
India - PTLSP: Provided rural financial services (including loans) to beneficiaries mainly in the fisheries sector, enabling them to pay off debts, improve access to markets, invest in fish vending businesses or other microenterprises. Facilitated insurance on productive assets, including boats and fishing equipment.	Increased gross income, total enterprise revenue and fish sales. Slight impact on resilience but no impact on production or productivity. Women's control over gross income increased, implying economic empowerment.	Well thought out and dedicated financial services for women's self-help and joint-liability groups significantly increased women's participation in fish and other microenterprises, increasing their incomes and decision-making over income. Enhancing resilience to shocks requires more than just rural financial services.
Pakistan - SPPAP-PK: Aimed to enhance the productive capacities of small-scale producers, increasing their resilience to shocks, and improving their overall living conditions in a sustainable manner. Focused on agribusiness self-employment (training) and livestock ownership.	Improved food security for both training and livestock components. The training component improved dietary diversity, and the livestock component increased female ownership of livestock. The ability to recover from shocks increased for both groups. However, there were no impacts on income, production or market access.	Although the food security of beneficiaries improved, there were no impacts on income, production or market access. Future projects should: i) provide targeted support, post-vocational training, and support procuring inputs, ii) provide additional support for market access, and iii) consider having a longer pay-back window to allow beneficiaries to complete production cycles.
PNG - PPAP: Developed coffee and cocoa value chains (VCs), establishing market linkages with private producer partnerships and improving roads. Introduced pest-resistant planting material and agricultural extension services.	Positive effects in the cocoa sector through intensified farming and increased yields and sales. Impacts in the coffee sector were less pronounced and concentrated on productive assets, gender and nutrition.	Addressing pre-identified specific constraints in the VCs (e.g. market linkages and cocoa pests) worked well, generating large impacts. Future projects should similarly consider: i) the specific constraints in each VC, and ii) other direct or indirect effects and tradeoffs, such as

		women's empowerment, food security and nutrition.
Philippines – CHARMP II: Aimed to improve the livelihoods of poor households from the indigenous communities in the CAR region. It provided a package of assistance at community and household levels including social mobilization & participatory investment planning; agroforestry and watershed management; agriculture, agribusiness and income-generating activities; and rural infrastructure development.	Increased total income, food security and productive asset ownership through higher engagement in livestock activities, farming of cash and non-seasonal crops and more land under production. No impact found on crop yield. While there is more market participation, there is no significant change in crop and livestock sales. No attributable impact on the ability to recover from shocks, but income diversification increased. Limited impact on women's empowerment.	The development of community level infrastructure can lead to wide ranging and spillover effects as well as create opportunities for income diversification, which should be accounted for at the time for project design. Future projects need to tailor components that address specific constraints that women face. Limited impacts on resilience call for a more holistic approach to strengthening it.
Solomon Islands - RDP II: Strengthened agribusiness partnerships to increase production and productivity. Offered community-driven development grants to improve basic infrastructure and services.	Increased cocoa production and sales, but no impact on total income and decreased coconut production and sales. Increased the ability to recover from shocks, dietary diversity and food security. Supported agribusinesses paid higher cocoa prices, sold more cocoa and hired more workers, which contributed to household-level impacts.	Low coconut prices led to decreased coconut harvests and sales. Better market access facilitated increased food security and dietary diversity. The latter, driven by dairy and sweets, calls for nutrition interventions for better diet quality. Projects in settings highly dependent on international trade should incorporate measures to support producers during trade disruptions. No impact on total income indicates future projects should consider the entire income generation structure for increased impact.

Ethiopia - RUFIP II: Focused on provision of rural financial services through MFIs and RUSACCOs in underserved poor areas. Worked to improve the legal and regulatory environment for RFIs. Provided a credit facility for RFIs and supported them to reach more clients.	Increased gross total income, driven by increases in gross crop, livestock and enterprise income. There was no change in net incomes due to increases in production costs, but crops and livestock sales increased in value along with increased income and dietary diversity. Livestock production efficiency improved.	Access to financial services does not necessarily lead to improved profitability from household production. Future rural finance programmes should consider complementary components to support production efficiency and net incomes. When job creation is a goal of rural finance interventions, additional measures are needed to balance the decrease in wage incomes.
Kenya - UTanNRMP: The project supported: i) community empowerment through training and sensitization of staff and school programmes, ii) sustainable rural livelihoods through on-farm demonstrations and distribution and matching grants, and iii) sustainable water and natural resource management through training in irrigation and water management, and rehabilitation of degraded forests.	Results found positive impacts on net income from crop, productive and housing assets, and ability to recover from climate shocks. However, there was no impact on net income. Also, although treatment households had greater dietary diversity, there was no impact on food security and no impact was observed in the livestock VC.	The project was successful in increasing crop income, asset accumulation, ability to recover from shocks and dietary diversity. Future programmes should: i) replicate project mechanisms to translate input expenditures to higher valued livestock, and ii) assess trade-offs between agriculture and livestock components. Positive results achieved on crop were related to the project support on irrigation systems, better management practices and improved seeds.

Lesotho - SADP: With goals of reducing rural poverty and enhancing rural economic growth on a sustainable basis, SADP promoted increased marketed production among project beneficiaries in the smallholder agriculture sector. To do so, it provided financial capital in the form of matching grants.	SADP oversaw improvements in agricultural assets and durable assets, and an increase in the probability of participating in markets. There were also increases in: agro-processing/value addition, business assets, production-related training, hired labour in terms of the number of employees, and those who have formal bank accounts, which signifies financial inclusion. However, there remain major challenges to profitability and resilience of the agribusinesses, and in efforts to increase household-level income.	Future programmes should carefully consider the theory of change and whether the envisioned impact pathways are realistic. This is especially important in terms of translating increased investments in assets at the agribusiness levels to improvements in business profits, household incomes, resilience and sustainability.
Malawi - SAPP: Promoted good agricultural practices and distribution of agricultural inputs through extension planning areas. The promotion was based on evidence coming from research conducted via an institutional partnership. Offered technical assistance and capacity building via FFS.	Increased crop income, maize and soybean yields, crop diversification, adoption of good agricultural practices (GAPs) and decreased food insecurity. The project also increased wage incomes for women and their leadership in community groups.	The adoption of promoted practices has generally increased. Although two components of CA increased, minimum tillage adoption remained very low. Some practices increase both production and yields, but do not translate into higher income because farmers had low market access. Future projects should focus on the whole VC linking farmers to the market and investing in agribusiness opportunities.

Mozambique - PROSUL: Promoted inclusive agribusiness VCs for cassava and livestock. The impact assessment focused on cassava, due to data availability. ASAP financing supported the adoption of climate adaptation practices.	Increased the cassava harvest and yield, as well as the probability of selling agricultural products, improved resilience through income diversification and increased adoption of climate adaptation practices. But it did not increase sales revenues and, even though housing assets increased, it had no impact on total income.	Adoption of practices proposed by the project led to increased production and productivity, but not to higher income from sales. Future projects should integrate components to link farmers to the markets including processing, packaging and distributing for sustainable impacts.
Tanzania - MIVARF: Aimed to improve market linkages and access to finance by: i) rehabilitating or constructing roads, warehouses and markets; ii) Supporting value addition through post-harvest training centres; iii) training beneficiaries in production practices and market linkages; iv) supporting grassroots financial service providers; and v) developing rural financial system through smallholder credit guarantee scheme.	Increased crop production and yields both in quantity and value. Increased the productive assets, crop income, food security and nutrition. Enhanced engagement with formal financial institutions, as beneficiaries took higher loans. The support through production and marketing extension services that promoted agricultural technologies (especially in the rice VC), increased the use of improved seeds and irrigation.	Future programmes should leverage the role of cooperatives to empower producers and support access to markets. Address remaining barriers to accessing and using financial services, and incorporate targeted resilience and women's empowerment components.

Zambia - S3P: Promoted participation in farmer organizations (FOs) and adoption of good agricultural practices to increase production and incomes in cassava, groundnut and beans mixed systems. It also promoted farmer field schools (FFSs) to increase adoption of improved planting materials and conservation agriculture. FOs were provided training on management and entrepreneurship skills.	Significant increases in crop production and income and FO participation, with spillover impacts increasing maize production. Increased revenues from crop sales and resilience but not total income. Notably very low adoption of minimum tillage indicated low Conservation agriculture (CA) adoption, but increased use of improved planting material, residue retention and crop rotation.	Synergies with previous programmes ensured positive results in crop production and marketing. To achieve increases in total income, future programmes should consider the entire income-generation structure. CA adoption remains dismally low, indicating the need to assess what works, identify locally relevant practices and address local adoption barriers. Positive spillovers in maize production call for broadly applicable interventions rather than narrow crop focus to increase overall impact.
Argentina - PRODERI: Focused on developing and strengthening small-scale rural producers' productive capacities and market access through financial support to POs and indigenous communities.	Increased total and agricultural income, decreased transfer income and increased female leadership in POs. The total value of crop and livestock production significantly increased and, while market participation increased for livestock, it remained a challenge for crops.	The positive impact on market access was limited to livestock, with no impact on revenues from crop/livestock sales. Future projects should identify channels through which production gains can translate into higher revenues. Increased use of PO's heavy agricultural machinery contributed to the increased production and incomes and should be fostered in the future. Lack of physical and digital connectivity remain constraints to market access, calling for greater attention to local needs.

Bolivia - ACCESOS: Provided financial resources and training to improve the living conditions of rural households investing in economically viable natural resource management systems and small agribusinesses.	Increased gross income, productive assets and access to markets. With adoption of climate adaptation strategies, they reduced their ecological footprint by reducing livestock herds. Their diversification of income sources increased as did their resilience to any type of shocks.	The combined approach covering education, technical assistance and financial intervention in supporting farmers' adoption of climate adaptation options was successful – including from an environmental point of view. Adoption rates can be further increased with small-scale irrigation and continued technical assistance. Future projects can translate results into higher economic impacts by focusing on the VC.
Nicaragua - NICADAPTA: Aimed to reduce climate change vulnerability by supporting investments to facilitate access to markets for value added coffee and cocoa. Provided support to producer organizations, finance for productive infrastructure, access to agricultural technology and early warning climate information.	Increased assets and investments in infrastructure including farm level water and post-harvest infrastructure. The country suffered from a strong hurricane during the project. While infrastructure and assets were not enough to ensure higher incomes or production for beneficiaries, they were more resilient to climate shocks and more food secure than the comparison group.	Investments on assets and infrastructure have supported households' resilience. However, components related to training for climate adaptation and market connection have not produced the expected results. Future programmes should consider mechanisms to improve the adoption of good agricultural practices, but also to increase access to markets and reduce transaction costs.
Peru - PSSA: Provided grants to support the formation of POs and development of business plans. Promoted training in business management and technical assistance in production, processing and marketing of products. Supported territorial and natural resource management plans for communities, but the IA focused on business plan component.	Increased total income per capita and productive asset ownership, value of livestock, fish and bee production (but not crop production), market participation and household dietary diversity. The impact channels include increased access to bank accounts and loans, and probability for wage employment – including for women. Significant spillover effects in communities in treated districts through increased demand for technical services and inputs.	Future projects can amplify the potential for wage employment by identifying and providing training for locally needed skills by POs. This would increase spillover impacts by unleashing the demand for and supply of technical services and inputs. Access to infrastructure and financial innovations remained constrained, indicating the need for VC mapping, connecting beneficiaries to VCs, improving water infrastructure and devising incentives to connect producers with financial institutions.

Djibouti - PRAREV Pêche: Aimed to increase coastal fishers' access to fishing equipment and strengthen their resilience to climate change by: monitoring their impact on marine ecosystems; promoting infrastructure and climate adaptation policies using institutional strengthening; disseminating income-diversification strategies; and further strengthening the fishing VC including processing, conservation, marketing and financial support.	Increased total and fishery income thanks to improved fishing equipment and cooling facilities. The value and share of fish sales increased, as did food security and women's participation in fishing activities.	Positive benefits were highly correlated to project duration, with longer time participants seeing higher impacts. Future projects need to ensure long enough duration and regular disbursements for benefits to accrue.
Kyrgyzstan - LMDP II: Aimed to increase livestock productivity and climate resilience through community-based pasture management. Supported pasture user unions (PUU) to increase productivity and resilience of pastures, improve animal health and support income diversification.	Increased the number of livestock, the value of livestock production and revenues from sales, but not productivity. Total income increased and poverty decreased. Women's involvement in livestock activities increased, but no impact on other empowerment indicators. Seasonal pasture rotation increased, but given higher livestock numbers, pasture overuse and degradation continued.	Weak impact on pasture resilience due to the overuse of winter pastures calls for more focus on productivity through breed and feed management. Market access was limited, and future projects should focus on the VC component. Women's representation in PUUs increased, but empowerment requires focused interventions. Greater focus on community mobilization and sensitization is needed for larger and sustainable impacts.

Tajikistan - LPDPII: Aimed to increase livestock productivity while supporting adaptation to climate change by providing veterinary services, technical assistance and training on breeding techniques, water points and fodder supply. Introduced pasture rotations based on degraded pasture assessment implemented by the PUUs.	Increased livestock income and cattle productivity – as measured by weight and milk production. The combination of pasture rotation and reduced herd size decreased the ecological footprint. Ability to recover from climatic shocks is lower for beneficiaries, although they were significantly less likely to report climatic shocks. Women-headed households are empowered and there is a strong social capital.	Livestock production and productivity increased, while its impacts on the environment and ecological footprint decreased by reduced herd sizes and using rotational plans. This was achieved by technical assistance in feeding practices, veterinary services, water points and reproductive assistance. Future interventions should ensure the herd sizes do not increase and monitor impacts on pasture restoration.
Tunisia - PRODESUD II and PRODESUD I: Aimed to improve living conditions and reduce rural poverty by improving the agropastoral systems, increasing agricultural productivity and diversifying income sources. Supported local initiatives through improving infrastructure, funding micro enterprises, providing training and technical advice, and enhanced institutional development through supporting agricultural development groups.	Increased livestock income and productivity, asset ownership and value of olive production. No impact on market participation for livestock, although revenues for livestock and livestock products are higher. Beneficiaries are also more food secure and report, similarly to their comparison group a high number of food types consumed (more than 9 out of 12) but have a lower consumption of condiments and spices.	Although livestock income increased considerably, which is the main income source for beneficiaries, total income and market access did not improve. Future projects should address the barriers to commercialization of livestock products. Women's empowerment remains a challenge that should be addressed by directly engaging with women.
Ghana - REP III: This was the third phase of a programme that begun in 1995 to enhance the contribution of micro-small enterprises (MSEs) to poverty reduction. REPIII provided business advisory services, technical training and technologies to MSEs. It also supported access to finance through matching grants and	Increased total income and assets through higher self-employment income and improved business management, bookkeeping and access to finance. While self-employment income increased, so did costs, leaving profitability unchanged. Diversification into the non-farm sector supported improved resilience, food security and diets. Women's	The transition from less profitable crop towards non-agricultural activities generated substantial income gains, but MSE profitability remained stagnant. Future programs need to identify the binding constraints to MSE growth and profitability and reduce costs with better input and output market opportunities. The persistence of exorbitant interest rates called for a stronger credit market regulatory framework and enforcement.

refinancing facilities for participating financial institutions, and capacity-strengthening of supporting institutions.	empowerment significantly improved in multiple dimensions.	
Mali - RFP: Focused on access to financial services and credit markets. Aimed to improve access to credit, increase self-employment and provided institutional support in building good governance.	Positive impact on women's empowerment and household gender parity that led to increased respect and positive change in attitude toward domestic violence. Increased productivity of plots jointly managed by women and men. Household income, crop production and food security decreased, signalling a shift from agriculture to entrepreneurial activities.	Future programmes should identify how women's empowerment can be translated into increased household income. Need to identify how jointly managed agriculture activities can be harnessed to increase resilience and sustainability. That food security decreased while self-employment activities increased calls for greater focus on food security.
Mauritania – PASK II: Aimed to increase income and improve the living conditions by building an inclusive economic and social fabric. Supported sustainable management of natural resources through: i) soil rehabilitation and surface water management, ii) support to agriculture, livestock and natural resources, iii) professional training and technical advice, and iv) local infrastructure.	Increased value of livestock production, wage employment and agribusiness activities. Improved resilience due to reduction in exposure to non-weather shocks. Increased women's participation in income-generating activities and literacy. Crop income decreased and crop diversification increased for beneficiaries. Water infrastructure is still lacking.	Future programmes should identify and address constraints that limited impacts, such as the lack of alternative activities to herding (including agriculture) that are not dependent on weather and water. They also should recognize and address the challenges of dealing with: i) extremely degraded environmental circumstances; ii) limited access to public services (e.g. health, education and transportation); and iii) degraded infrastructure. Large water systems involve high costs and require funding and mechanisms to maintain.

Nigeria - VCDP: Supported developing market linkages and infrastructure, and strengthening of farmers' organizations for rice and cassava. Facilitated value addition, increased access to inputs, improved technologies, credit and information.	Increased rice production and yield, but no impact on total income. Increased food security, but not dietary diversity. Decreased the share of total value of crop production from jointly managed plots and total value of crop sales for which earnings are jointly controlled. Project impacts were particularly strong for the rice VC, but not for the cassava VC.	Increased rice production did not translate into increased income or assets, suggesting that these positive outcomes could have come at the expense of other income sources. Future programmes should consider the total income generation structure to increase total income.