Generating evidence on

Climate change adaptation

through IFAD projects

IFAD
Investing in rural people

RESEARCH AND IMPACT

Generating evidence on

Climate change adaptation

through IFAD projects[1]

[1] This note has been prepared by Romina Cavatassi, Sinafikeh Gemessa and Emanuele Zucchini from the Research and Impact Assessment (RIA) Division of the Strategy and Knowledge Department at IFAD. For more information: r.cavatassi@ifad.org; s.gemessa@ifad.org; riamailbox@ifad.org.

Generating evidence on Climate change adaptation through IFAD projects

IFAD's beneficiaries are among the most exposed to and the most impacted by climatic shocks and climate change, albeit not being the main contributors of GHG emissions. Supporting beneficiaries to adapt to climate change is a priority for IFAD's investments and has been mainstreamed in IFAD operations.

Adaptation to climate change is defined by the IPCC as *"the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects"* (IPCC, WGII, III).

So far only about 1.7 percent of the money invested globally in climate finance is reaching small-scale producers, and mostly going to mitigation objectives compared to adaptation. The Adaptation for Smallholder Agriculture Programme (ASAP) has been instrumental in supporting farmers to adapt to climate change and to help IFAD leverage and invest on climate adaptation and mitigation. 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 aimed to provide a new source of co-financing to scale up and integrate climate change adaptation across IFAD's investments.

ASAP was successful in channelling climate finance to smallholders through the blending of grants with IFAD regular loans to include activities to adapt to climate change in 42 projects. This integration has followed a logic, a theory of change (ToC), which implies: a) to develop deeper understanding and awareness of climate risks, through climate risk assessments for each project to better understand the context under which households operate and what are the adaptation requirements; b) to capture synergies across sectors building on sustainable management of natural resources (multiple benefit approach); and c) to leverage new and additional sources of climate finance in a participatory manner, thus fostering scaling up processes.

Between 2019 and 2021, IFAD has invested about $1220 million[2] including co-financing in climate finance across the developing world. Most of this finance, around 90 percent, went to climate adaptation interventions for small-scale producers.

Climate change adaptation is a context specific process as are livelihood and production strategies. It is influenced and determined also 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 Vietnam are different from those needed in the drought prone areas of Mauritania or Malawi or to prevent impacts of erosion from the steep Andean fields. As such, the solutions in terms of policy and investments have to also be context specific.

Given the context-specificity requirement of adaptation, the analysis conducted and here reported has required that for each project a detailed study of the context and of the adaptation options promoted has been carried out. These have then been organized into a screening tool where, for each option promoted, relevant indicators needed to measure the adoption have been developed 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 tools for the projects under assessment.

It is important to note that in estimating impacts geo-referenced climatic variables and their variation across time and space are included in the analysis. These have been used both 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 impact estimates** - 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 even in the context of low overall adoption rate of adaptation options identified in the literature, ASAP projects help identify important determinants of increased adoption. By looking at adoption rate and

[2] Report on IFAD's Development Effectiveness (RIDE). 2022. *Forthcoming*.

projects achievements it is also possible to draw conclusions on the most suitable practice(s) in the different context analysed.

Measurement

Under the Impact Assessment program of work, IFAD has started measuring the role of adaptation and its welfare implications. This is done in two different Steps:

1. **Assessment of rate of adoption of adaptation options promoted by the projects;**
2. **Impacts on livelihoods outcomes and resilience**

1. Rate and role of adaptation options

Given the context-specificity requirement of adaptation, this analysis has required that for each project a study of the context and of the adaptation options promoted by the project has been conducted. Adaptation options have then been organized into a screening tool where for each option indicators needed to measure impacts on adoption of that option have been developed together with variables needed to construct the indicator. As a result, specific questions tailored to the context have been included in the data collection conducted for ASAP supported projects. These projects have clear climate and environment adaptation components and were part of the sample of projects under the Impact Assessment program of work.

The list of ASAP projects for which an impact assessment study has been conducted is included below:

Region	Country	Project	Acronym
LAC	Bolivia	Economic Inclusion Programme for Families and Rural Communities	**ACCESOS**
NEN	Djibouti	Programme to Reduce Vulnerability in Coastal Fishing Areas	**PRAREV**
NEN	Kyrgyzstan	Livestock and Market Development Project II	**LMPD II**
ESA	Mozambique	Pro-Poor Value Chain Development	**PROSUL**
LAC	Nicaragua	Adapting to Markets and Climate Change -	**NICADAPTA**
NEN	Tajikistan	Livestock Pasture Development Project II	**LPDP II**

For each of these projects impacts on adoption of adaptation interventions promoted have been estimated and are reported in the table below. Given context-specificity, adaptation options are different for each country analysed.

Impacts on adoption of adaptation in ASAP projects

Country	Project	Focus	Indicator	Impact (pp)	Counter-factual
Bolivia	**ACCESOS** Economic Inclusion Programme for Families and Rural Communities	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	**PRAREV** 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	**LMDP II** Livestock and Market Development Project 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

Country	Project	Focus	Indicator	Impact (pp)	Counter-factual
			Does not use spring pasture	69***	13
Mozambique	**PROSUL** Pro-Poor Value Chain Development -	Adaptation to climate 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	**NICADAPTA** Adapting to Markets and Climate Change	Adaptation to climate 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	**LPDP II** Livestock 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 Assessments Reports, forthcoming.

Note: Impacts are reported in per cent point changes for all indicators except for Tropical Livestock Unit (Tajikistan) where the impacts are in percent. The counter-factual values are in per cent except for the abovementioned indicators expressed in their original continuous values. The counter-factual 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 percent; *** at 1 per cent.

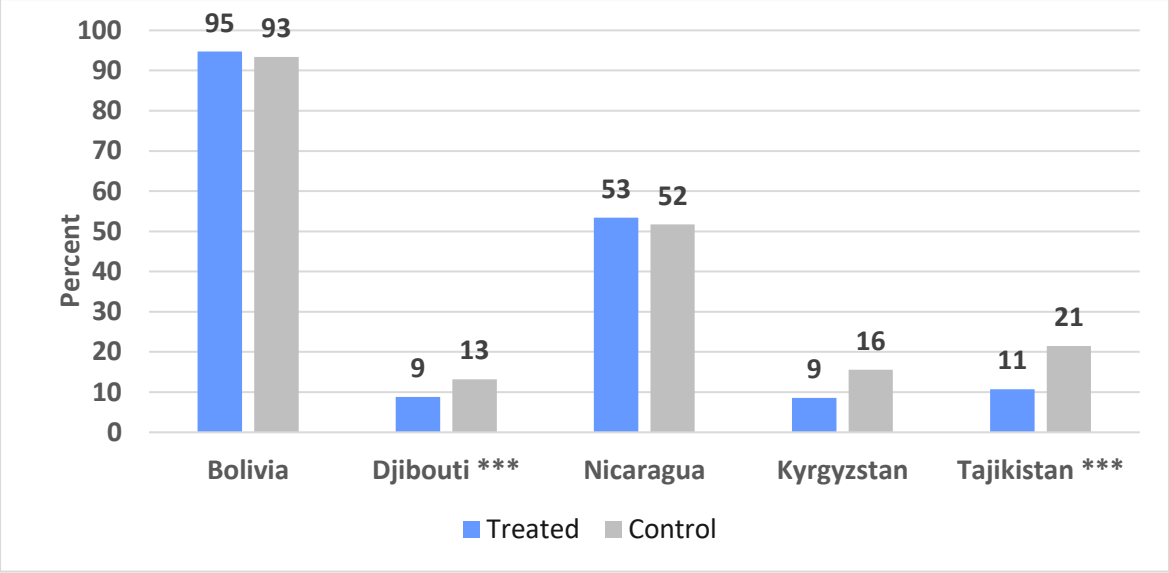
It is important to note that in estimating impacts, geo-referenced climatic variables and their long- and short-term variations are included in the analysis. These have been used to support the design of the sampling strategy. Geo-referenced data – such as those on long-term biophysical characteristics, 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 in the context of overall low adoption rates, 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.

2. Impacts on livelihoods outcomes and resilience

The second key step taken in assessing impacts where adoption of adaptation options is relevant is to estimate rate of shocks perceived by households which is expected to be lower when a relevant shock occur in case of higher adaptation. The graph below shows indeed that when there is a significant difference in climatic shock suffered, it is higher for the comparison group.

Figure 1: Percentage of households that experienced climatic shocks

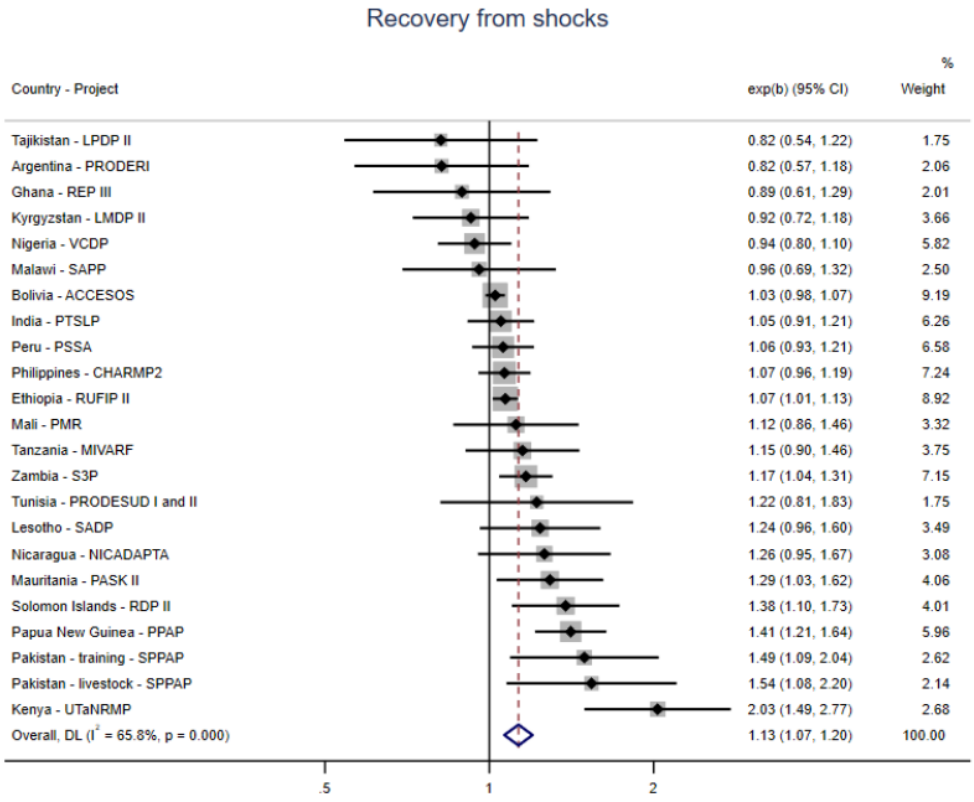


Note: Asterisks indicate the level of statistical significance in differences in means: * at 10 per cent; ** at 5 percent; ***1 per cent

In cases in which households report to have experienced shock (s), assessment of the project's impact on their resilience is conducted. Resilience is self-reported and measures whether and to what extent households that experienced shocks have bounced back to a similar, lower or higher level of livelihood than before the shock. Those that bounce back to a similar or higher level are considered resilient.

In the following forest plot we present the average effect size obtained through a meta-analysis where the ASAP projects have been combined with a larger sample of projects and where the likelihood of resilience among those that experienced climatic shocks is reported.

Figure 2: Impact on ability to recover from climatic shocks

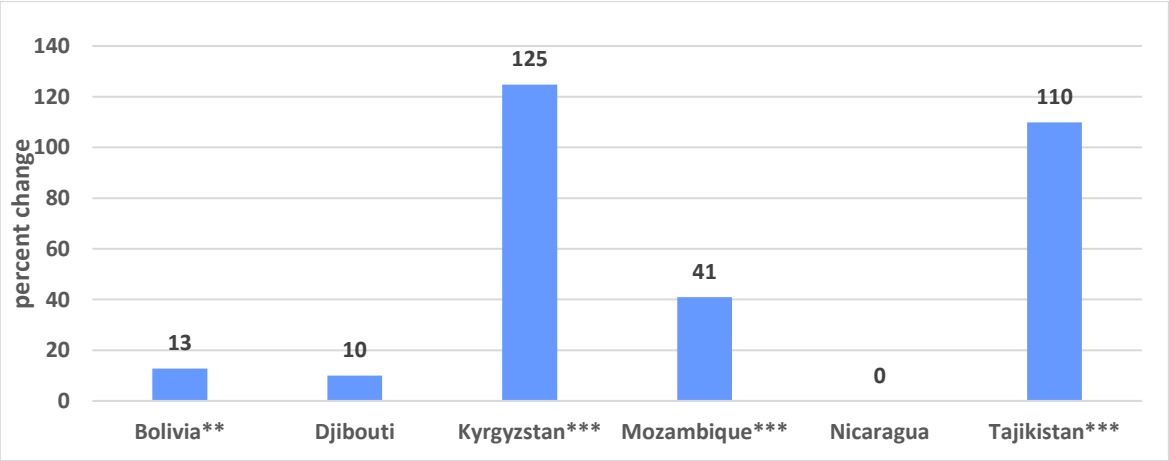


IFAD beneficiaries are on average 13% more likely to recover from climatic shocks.

Two final and key important welfare indicators are very relevant for the beneficiaries of ASAP projects that have adopted new production methodologies and technologies to adapt to climate change. In this regard, impacts on income and production level are reported in Figures 3 and 4.

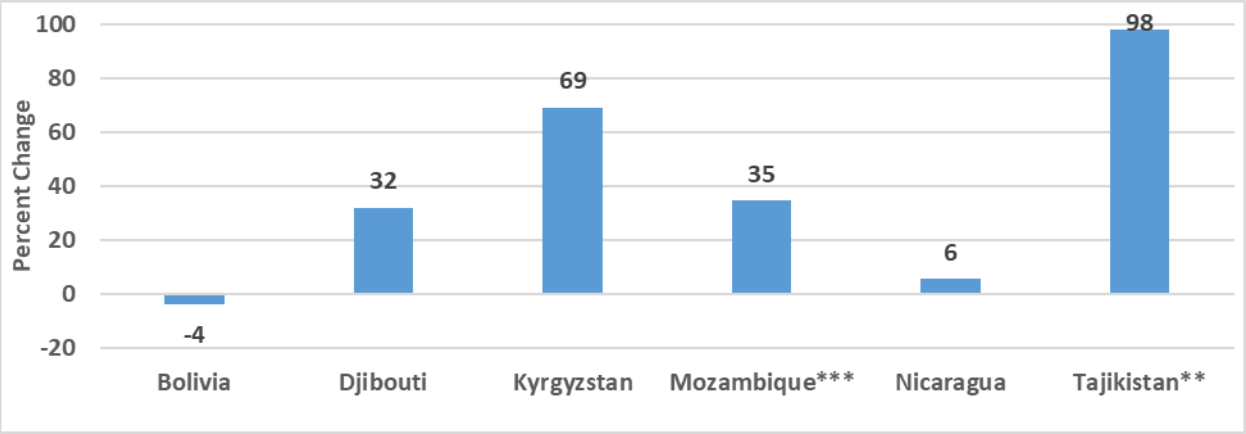
The results in Figure 3 show that the impact on income indicators range from 125 per cent increase in Kyrgyzstan to 13 per cent increase in Bolivia vis-à-vis the comparison group. The impacts on production range from 98 per cent increase in Tajikistan to 35 per cent increase in Mozambique.

Figure 3: Impact on income indicators



Note: Asterisks indicate the level of statistical significance in impacts: * at 10 per cent; ** at 5 percent; ***1 per cent. The income indicators considered include gross total income (Bolivia), net income (Djibouti), gross income from livestock (Kyrgyzstan and Tajikistan), value of cassava production (Mozambique), and gross income (Nicaragua). The impact estimates on income for Djibouti and Nicaragua are not statistically significant.

Figure 4: Impact on productive capacity



Note: Asterisks indicate the level of statistical significance in impacts: * at 10 per cent; ** at 5 percent; ***1 per cent. The production indicators considered include value of harvest per hectare (Bolivia), sales from fish landed per hours worked (Djibouti), value of livestock production (Kyrgyzstan), value of cassava yield (Mozambique), cocoa yield (Nicaragua), and milk production per animal per year (Tajikistan). The impacts on productive capacities of the projects considered in Bolivia, Djibouti, Kyrgyzstan, and Nicaragua are not statistically significant.

Conclusions

Whereas measuring adaptation and its role in livelihood is a work in progress, this note indicates a good collection of evidence both in terms of adoption rate as well as in terms of impacts on resilience, income, and production. The findings of the impact assessments also show that the adaptation options IFAD has been investing in to support vulnerable rural communities in adapting to climate change and building their climate resilience have improved the lives and livelihoods of beneficiaries in different contexts.

Investing in rural people

International Fund for Agricultural Development
Via Paolo di Dono, 44 – 00142 Rome, Italy
Tel: +39 06 54591 – Fax: +39 06 5043463
Email: ifad@ifad.org
http://www.ifad.org