Independent Office of Evaluation

IFAD
Investing in rural people

Infrastructure at IFAD (2001-2019)

EVALUATION SYNTHESIS

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Evaluation Synthesis

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Front cover: Beneficiaries of the Community-based Agriculture and Rural Development Programme, Dutse, Jigawa State, Nigeria. ©IFAD/Hauwa Elyakub

Back cover: The Gourdjia - Birnin Kouka road, Niger, built by the Family Farming Development Programme in Maradi, Tahoua and Zinder Regions (left). ©IFAD/Chaïbou Dadi; Marshlands in Ruvubu, Kayanza Province, Burundi. About 30 per cent of the primary canals were bricked as part of the hydro-agricultural development financed by the Value Chain Development Programme (right). ©IFAD/Christ-Venant Nirikana

Foreword

Following the request by the Executive Board and Management, the Independent Office of Evaluation of IFAD has prepared an evaluation synthesis on infrastructure at IFAD. Between 2001 and 2019, about 30 per cent of all approved IFAD funding went towards the construction or rehabilitation of infrastructure, and towards the related capacity-building. The synthesis confirms that these investments were relevant and effective and made a contribution to poverty reduction in developing countries. In addition, the synthesis identifies several areas of concern that will require further attention.

Drinking water has long been an essential part of IFAD-supported projects. Access to clean water remains a top priority for poor women and men. Yet, IFAD's investments in drinking water have plunged to almost zero in recent replenishments. The synthesis suggests that integrated and multiple water-use approaches have the potential to improve water-use efficiency and climate resilience, and enhance the sustainability of productive water use and irrigation systems.

The synthesis rates sustainability as unsatisfactory for the majority of infrastructure interventions reviewed. Reasons for poor sustainability include insufficient consideration of infrastructure ownership and maintenance at design, and poor technical quality of infrastructure. Government partners often provided insufficient budget and technical knowledge, while private sector participation in operation and maintenance was rare.

The larger part of IFAD's investments was delivered through community-based approaches. With the demand for infrastructure increasing, particularly in middle-income countries, IFAD will have to devise a strategy for scaling up these investments while also addressing aspects of underperformance, in particular with regard to efficiency and sustainability. IFAD will also have to assess public and private partnerships, with their associated costs and risks. Cofinancing partnerships often increased the transaction costs for both IFAD and its government partners.

Importantly, IFAD's niche in infrastructure and increased future borrowing for infrastructure need to stay closely linked to its poverty reduction mandate. IFAD's comparative advantage clearly lies in the provision of small-scale, climate-smart and pro-poor infrastructure in line with its mandate, but this needs to be articulated more clearly at the strategic level. Meeting the demand of IFAD's core target group also requires balancing the provision of productive and market infrastructure with infrastructure that caters for basic needs, such as drinking water.

The synthesis concludes that IFAD has a positive track record and added value, but that it needs to step up its internal technical capacity and guidance to meet the above challenges. There are a number of constraints to be addressed, such as the limited availability of specialized technical staff, climate risk expertise, and capacity to track the performance of infrastructure investments from design through to implementation and completion. Hence, there is an urgent need to reconcile IFAD's strategic infrastructure approach with its infrastructure support capacity.

I hope the findings, lessons and conclusions generated by this synthesis will be useful to inform and improve the performance of infrastructure investments under the Twelfth Replenishment of IFAD's Resources and beyond.

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This evaluation synthesis was prepared by Johanna Pennarz, Lead Evaluation Officer at the Independent Office of Evaluation of IFAD (IOE), together with Detlev Puetz, IOE Senior Consultant. The synthesis includes data analysis prepared by Valentina Di Marco Conte (IOE Evaluation Analyst), Lisa Forestier (IOE Intern) and Nuri Niyazi (IOE Evaluation Analyst). The case studies were prepared by the following IOE consultants: Lilit Melikyan (case study synthesis, Sri Lanka case study); Oscar Anaadumba (China and Philippines case studies); Lisa Forestier (Chad and Madagascar case studies); Tornike Gotsiridze (Georgia case study); Paola Nacamulli (Brazil case study); and Nuri Niyazi (Bangladesh case study). The Senior Independent Adviser for this synthesis was Andrew Fyfe (Head of Evaluation, United Nations Capital Development Fund); he commented on the draft report. Manuela Gallitto, IOE Evaluation Assistant, provided valuable administrative and logistic support throughout the process.

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The final draft has benefited from IOE peer review and the comments of IFAD Management.

Contents

Annexes and appendices[1]

[1] Appendices are case studies on the following countries: Bangladesh, Brazil, Burundi, Chad, China, The Gambia, Georgia, Madagascar, Philippines, and Sri Lanka. They are available online at the following link: https://bit.ly/3qrs7sm.

Abbreviations and acronyms

4P	public-private-producer partnership
ADB	Asian Development Bank
AFD	Agence Française de Développement
AfDB	African Development Bank
APR	Asia and the Pacific Division of IFAD
CCA	climate change adaptation
CCRIP	Coastal Climate Resilient Infrastructure Project
CDD	community-driven development
COSOP	country strategic opportunities programme
CPM	country programme manager
CSPE	country strategy and programme evaluation
ECG	Evaluation Cooperation Group
ENRM	environment and natural resources management
ESA	East and Southern Africa Division of IFAD
ESIA	environmental and social impact assessment
ESR	evaluation synthesis report
FAO	Food and Agriculture Organization of the United Nations
FGD	focus group discussion
GEF	Global Environment Facility
GRIPS	Grants and Investment Projects System
HIPC	Heavily Indebted Poor Countries Initiative
IDB	Inter-American Development Bank
IFAD5	Fifth Replenishment of IFAD's Resources
IFAD6	Sixth Replenishment of IFAD's Resources
IFAD7	Seventh Replenishment of IFAD's Resources
IFAD8	Eighth Replenishment of IFAD's Resources
IFAD9	Ninth Replenishment of IFAD's Resources
IFAD10	Tenth Replenishment of IFAD's Resources
IFAD11	Eleventh Replenishment of IFAD's Resources
IFI	international financial institution
IOE	Independent Office of Evaluation of IFAD
LAC	Latin America and the Caribbean Division of IFAD
LCS	labour-contracting society
LIC	low-income country
M&E	monitoring and evaluation
MDG	Millennium Development Goal
MOA	ministry of agriculture
MSME	micro, small and medium-sized enterprise
MTR	mid-term review
NEN	Near East, North Africa and Europe Division of IFAD
NRM	natural resources management
O&M	operation and maintenance
OFID	OPEC Fund for International Development
PCR	project completion report
PMI	Sustainable Production, Markets and Institutions Division of IFAD
PMU	project management unit
PPE	project performance evaluation
RIA	Research and Impact Assessment Division of IFAD
RIDE	Report on IFAD's Development Effectiveness

RMF	results management framework
RTT	rural roads, travel and transport
SDG	Sustainable Development Goal
SECAP	Social, Environmental and Climate Assessment Procedures
SME	small and medium-sized enterprise
SO	strategic objective (IFAD)
UNDP	United Nations Development Programme
UNOPS	United Nations Office for Project Services
WCA	West and Central Africa Division of IFAD
WFP	World Food Programme
WUA	water users' association

Executive summary

A. Introduction

1. The Independent Office of Evaluation of IFAD (IOE) prepares evaluation synthesis reports (ESRs) with the aim of capturing knowledge and experiences on a selected theme. Infrastructure was selected as a topic for the 2020 ESR because of its interest to both IFAD Management and the Executive Board. Investments in infrastructure constitute a significant share in IFAD's portfolio**.** Between 2001 and 2019 US$6.972 billion, about 30 per cent of all approved IFAD funding, went towards the construction of new or rehabilitation of existing infrastructure and the related capacity-building. In many cases these investments have been possible because of cofinancing arrangements with other international development partners.

2. **The ESR objectives** were to: (i) provide a conceptual framework clarifying the contribution of infrastructure to IFAD's strategic objectives; (ii) review IFAD's strategic positioning, comparative advantage and partnerships in the provision of infrastructure; (iii) assess relevance, coherence, effectiveness, efficiency and impact of IFAD infrastructure investments; (iv) examine the extent to which IFAD-supported infrastructure addresses issues of sustainability, climate resilience and innovation; and (v) identify good practices and lessons learned.

3. **Scope.** The synthesis covers the period from 2001 to 2019 (from the Fifth to the Eleventh Replenishment of IFAD's Resources [IFAD5 to IFAD11]), which coincides with the broader shift from community-based to value chain approaches. The review covers all categories of IFAD infrastructure investments. It pays specific attention to themes that were of strategic importance for IFAD during the review period, such as infrastructure for smallholder access to markets and value chains, natural resource management (NRM) and climate change adaptation (CCA), and infrastructure in states with fragile situations.

4. The synthesis drew its evidence from evaluations of infrastructure-heavy projects (35 projects)[1] conducted between 2001 and 2019. In addition, 10 projects were selected as case studies to provide an in-depth review of the infrastructure results and the factors contributing to them. The case studies included ongoing and completed projects with significant infrastructure components. They drew from a wider range of evidence, including project documents and impact assessments from the Research and Impact Assessment Division, where available. The ESR also identified the 10 country portfolios with the highest investments in infrastructure and reviewed the related country strategy and programme evaluations to understand the partnerships and strategic considerations driving those investments. Interviews and focus groups with IFAD technical staff and consultants provided additional insights into the factors contributing to success or failure.

B. Findings

IFAD strategy, safeguards, data systems and capacities

5. **Strategy.** Infrastructure is omnipresent in IFAD's strategies and operations, although it has received relatively little attention as a distinct investment instrument. For example, IFAD does not have an infrastructure policy or a dedicated infrastructure strategy other than the Social, Environmental and Climate Assessment Procedures (SECAP) safeguards. Nor does IFAD have sector-specific policies or strategies, for example on water. However, infrastructure is a key ingredient to achieve IFAD's strategic objectives. IFAD sees its comparative advantage in the provision of small-scale,"last-mile" and community-driven infrastructure. In the context of the Sustainable Development Goals (SDGs), last-mile infrastructure and

[1] "Infrastructure-heavy" meaning that more than 30 percent of the project budget was allocated to infrastructure.

services reaching out to the remotest places and those at risk of being left behind have received particular attention.

6. **Demand-driven approach.** IFAD's approach to infrastructure is demand driven. The strongest drivers for infrastructure investments by IFAD are government and beneficiary demand. IFAD's long history of cooperation and institutional support for infrastructure users' associations and farmers' groups in client countries have led to direct demand by governments and beneficiaries for IFAD infrastructure investments, particularly when cofinanciers are not available. Partners appreciate the long-term expertise and comparative advantage IFAD has gained from working with infrastructure users' associations, mostly in community infrastructure planning and operation and maintenance (O&M), and its presence in the agricultural sector.

7. **IFAD's Strategic Framework 2016-2025** suggests prioritizing productive rural infrastructure, in particular irrigation, roads, energy, communication, networks, storage and markets. It specifically mentions farm-to-market roads, storage facilities and marketplaces and infrastructure support for the rural financial sector. Drinking water, once a basic ingredient in community-based projects, has almost disappeared from IFAD's strategies. Under IFAD8 (2010-2012), the need to address water scarcity was still an area of focus, and this was re-emphasized in IFAD9, in the context of environmental degradation and climate change. Since then IFAD's focus on productive and market infrastructure has diverted attention away from "social" infrastructure, such as drinking water.

8. **IFAD's infrastructure investments.** About 30 per cent of all IFAD funding goes towards the construction of new or rehabilitation of existing infrastructure. Of all infrastructure investments, 42 per cent went towards production and 42 per cent to market access infrastructure. Roads and irrigation were the main types of infrastructure funded by IFAD during the review period (IFAD5-11). IFAD investments in drinking water declined from 8 per cent during IFAD5 to close to zero during IFAD11. About 40 per cent of infrastructure investments were realized through cofinancing in IFAD projects. The Asian Development Bank provides the highest share of international cofinancing for infrastructure, close to 22 per cent, followed by the OPEC Fund for International Development at 18 per cent. Governments have contributed altogether 18 per cent in domestic cofinancing for infrastructure.

9. **Social and environmental safeguards.** IFAD adopted the first environmental and social safeguards in 2009, but application has been less stringent than in other international financial institutions (IFIs). The SECAP were introduced in 2015 and, after their revision in 2017, thresholds for infrastructure risk categorization were included for the first time. The revised version also distinguishes between "do no harm" (risk assessments) and "do good" (mainstreaming of social, environmental and climate issues). After another revision in 2020, the SECAP moved from providing guidelines to serving as standards. They now require advanced screening of social, environmental and climate standards, and coverage of emerging and social risks and mainstreaming themes, and improve the balance between application of safeguards during project design and implementation. SECAP 2020 also integrate the procurement process, to mitigate risks and provide projects with the tools to effectively manage, monitor and enforce compliance of contractors with all social and environmental standards. The SECAP are seen as an excellent policy and basis for safeguarding IFAD infrastructure against climate change risks. How to apply SECAP for infrastructure has been spelled out in the "how-to-do climate-resilient rural infrastructure" toolkit.

10. **IFAD in-house capacity for technical support** of infrastructure planning, implementation and supervision is low. There is currently only a small unit of two technical staff members at IFAD headquarters (the "water and rural infrastructure desk") that provide cross-cutting infrastructure support services and guidance. The

number of staff seems low, given the need to coordinate knowledge management and follow-up on the safeguards and design for infrastructure-heavy projects (category A projects).

11. **Corporate data systems**. Infrastructure investments were either not clearly defined or not categorized in IFAD systems. Many IFAD infrastructure subprojects are only designed and developed during implementation and are not properly recorded in corporate data systems. This makes monitoring and evaluation (M&E) and safeguards follow-up at corporate level difficult. Tracking of infrastructure is particularly hard for cofinanced projects as parallel implementation is not regularly updated in IFAD supervision and corporate systems throughout the project cycle. There is no information on whether infrastructure investments are mainly focused on rehabilitation or construction of new infrastructure. M&E of infrastructure mainly focuses on counting outputs, mostly on the hard infrastructure side, and mainly for corporate reporting purposes. There is little emphasis on monitoring the "soft" dimensions of infrastructure, which are harder to measure, such as ownership, capacities and governance. Much of the M&E is done in a piecemeal way, with little value added for managing infrastructure-heavy projects and does not inform Management on the value added and ultimate benefits of infrastructure and related investments.

Performance and impact of infrastructure

12. **Overall performance.** Analysis of sample projects found that infrastructure subprojects overall achieved the set output targets. However, technical quality was not high and arrangements for sustainability were often unsatisfactory. Drinking water infrastructure overachieved its targets on average and had high utilization, indicating that this type of infrastructure responded well to the needs of poor households and women. Irrigation infrastructure overall achieved is targets, but technical quality and sustainability were unsatisfactory in the majority of cases. Transport infrastructure on average did not achieve its output targets; technical quality and sustainability were mixed, but roads had high utilization and benefited the poor. Community-driven development projects had high levels of user participation and overachieved their targets. Production and market-oriented projects generally performed less well.

13. **Market-related infrastructure.** The most common and generally satisfactory market infrastructure was the construction of roads, bridges and other forms of transport to and from markets. These ubiquitous roads were often among the most appreciated and successful investments of IFAD projects. The construction of enhanced marketplaces, stalls, warehouses and other storage facilities assumed significant market infrastructure resources. The main problems in their design and planning were the limited know-how of executing agencies about markets, public-private partnerships and required investment costs and efforts; and lack of strategic attention to markets within broader project contexts. Difficulties in market infrastructure planning and capacity support were often underestimated. Support for expanded and new forms of product aggregation and processing, producers' organizations and public-private partnerships was less frequent, and was seen mostly in projects and project components specialized in livestock, fisheries or horticulture. Expansions into markets sometimes emerged out of village users' associations that tried to add value to their production activities.

14. **Energy infrastructure.** Energy has received less attention in IFAD, but the ESR shows that it has the potential to yield significant benefits. Energy infrastructure activities had positive impacts for women. Women were actively involved in the planning and construction of the biogas systems, and utilization of this technology was closely related to a reduction in women's workloads. Performance of renewable and other energy sources varied. Those activities that were doing well usually were based on locally known technologies (hydroelectric or biogas) that were scaled up, occasionally with some technical and social improvements. Projects provided mostly

decentralized, small-scale and often household-based technologies. Other projects clearly suffered from poor analysis, planning and O&M, resulting also in low demand, particularly solar-panelled pumps and other installations.

15. **Water management and NRM.** Water infrastructure included domestic water supply, crop and horticulture production (including rainfed and irrigation), livestock drinking water and rangelands, fisheries and aquaculture, markets, and soil and water conservation. In most cases, there was no (evident) common framework for water resource planning and infrastructure provision and related services. Usually these initiatives were implemented separately. More integrated management of water resources would have addressed competing and peak demands, or hygiene questions around livestock water facilities also used by people. NRM projects showed some good results in increasing upland soil fertility and water efficiency and in reclaiming and stabilizing lands and forests, but they were often not linked with other water-related interventions, such as irrigation. A watershed-based approach worked only in a few countries (e.g. Rwanda). Integrated management of water and other resources can be complex since it involves different agencies with specific mandates and jurisdiction.

16. **Irrigation infrastructure.** Irrigation accounts for the lion's share of IFAD's infrastructure investments, amounting to US$1,417 million (IFAD5-11), including cofinancing. The experience has been rather mixed. IFAD's investments mainly focused on the construction or rehabilitation of secondary and tertiary canals and capacity-building for water users' associations (WUAs) and to a lesser extent also on the institutional strengthening of government irrigation managers for river offtake and main canals (e.g. Sudan). However, the institutional effectiveness of WUAs was often limited. Few resources were invested in WUA and communal management for rehabilitating small-scale irrigation infrastructure and ensuring economies of scale in these schemes (e.g. Niger). Other IFIs also learned that the classic small-scale irrigation schemes performed considerably below expectations. Studies have suggested paying more attention to technical, social and governance aspects, such as tertiary channel management. The widespread government disengagement from irrigation finance, decentralization and irrigation management transfers remains a challenge. WUAs and the private sector will need to better manage their new responsibilities and broader partnerships with government, and non-government stakeholders will also be required.

17. **Poverty impact.** Infrastructure linkages with poverty reduction are direct and indirect, and are mutually reinforcing. Studies of the Research and Impact Assessment Division found that focused projects with interlinked activities and objectives could generate larger impacts than projects that had a large number of unrelated and small interventions spread across project areas. The ESR case studies also found that infrastructure interventions had to be linked for poverty impact. Notably, projects that had linked agricultural productivity infrastructure, such as irrigation, livestock and fisheries infrastructure, with marketplaces or roads had a better poverty impact. Large and small-scale irrigation infrastructure can contribute significantly to food security when well managed and coupled with market access. However, irrigation projects carried a high risk of excluding people with less access to land. The combined effort of small-scale irrigation rehabilitation and interventions to increase soil productivity contributed to expanded cultivated land and productivity. Social infrastructure contributed to improved livelihoods through safe water supply and sanitation, community health centres, schools and libraries, and household biogas units, digesters and eco-stoves.

18. **Gender focus in sample projects**. Social (education and health), energy, livestock and fisheries infrastructure investments were the most successful in reaching women. Transport, market, post-harvest and value addition infrastructure were less supportive of women in the majority of cases reviewed. The case studies draw attention to special measures that were needed to facilitate women's representation

in infrastructure projects. Projects focused on value chains and on specialized infrastructure tended to make few provisions for women and largely failed to engage them. The extent to which women were able to benefit from access to water, be it drinking water or for productive purposes, varies. The most obvious benefit, which is consistently noted in evaluations, is related to the time saved as a result of the closer proximity of water sources. The often insufficient quality of drinking water in community-operated facilities limits those benefits.

19. **User capacities and participation**. Community mobilization and participation in subproject identification and planning are a common feature in most IFAD-supported projects. The main purpose is to enhance local ownership of the infrastructure built. The strengthening of community-level organizations through a long-term empowering approach was often a key feature of community-driven development projects. The formation and strengthening of users' groups was a common approach to involve users in the governance/O&M of infrastructure. In the successful cases, the users' groups were able to prepare their organizational O&M and financial plans. However, capacity-building was often insufficient to ensure the sustainability of the infrastructure. Users' groups were stronger in community-driven and community-based projects but often were not strong enough to perform their roles in production and market access projects.

20. **Government capacities**. Implementation capacity was frequently found to be insufficient. The complexities and novelties of infrastructure design and participatory processes with high capacity requirements reportedly slowed down start-up and delivery. Local capacity for construction contract work by service providers was often low, as was project management unit capacity to procure and supervise such work, which is often undertaken in distant target areas. Project management units frequently lacked the required expertise to oversee the infrastructure subprojects. Ongoing decentralization of infrastructure services affected performance in sectors such as irrigation and roads where staff and financial resources were scarce. The case studies highlighted IFAD's limited engagement in broader institutional issues and policy frameworks related to infrastructure.

21. **Coordination in cofinanced projects.** Combining financing from different sources or complementary activities from parallel operations creates massive challenges in terms of synchronization and linkages. Reconciling different donor cycles, the alignment of timing of funding and delayed cofinancing were common problems. These were compounded by different policies, procurement processes and administrative rules for procurement and financial management that led to complexity and delays. Infrastructure subprojects were often not synchronized with the overall project cycle, and the various hard and soft infrastructure elements, and the complementary capacity-building or marketing activities were often weakly linked, diluting project results. Complex activities following different timelines were often not completed within a single project cycle, leading to unfinished structures, ineffective institutional arrangements and low sustainability. Joint supervision with other IFIs was difficult to organize and IFAD found it hard to follow up on priority issues and concerns. Last, different monitoring and reporting requirements may lead to difficulties in IFAD capturing project results.

Governance and institutional arrangements

22. **Infrastructure ownership and governance.** The institutional and ownership arrangements for infrastructure define levels of user participation and access, responsibilities for operations and maintenance, and ultimately the sustainability of the infrastructure built or rehabilitated. Centralized governance has been most common for irrigation and drainage infrastructure. Decentralized governance arrangements, where local government was the public entity owning and managing infrastructure, often together with users, were the most common model for transport, drinking water and sanitation infrastructure. However, the sustainability depended on local governments' ability to raise O&M funds. Governance was fully

decentralized in community-driven development, where communities on their own were in charge of managing local wells, water tanks, small-scale irrigation or feeder roads, and sometimes also social infrastructure. Because users were fully responsible for financing O&M and replacements, sustainability was an issue for public goods where insufficient fees were raised to cover the costs of O&M and replacement parts. This problem was less obvious for revenue-generating productive and market infrastructure.

23. In some cases, the private sector participated in governance, particularly in market and value added infrastructure. Here, the presence of functioning farmers' organizations, cooperatives and small and medium-sized enterprises was important, and clear rules had to be in place to ensure that access remained inclusive. Revenue from the use of infrastructure enhanced the prospects of sustainability, but there were cases where user fees created barriers for the poor and for women. Inter-community governance was advantageous for NRM, such as watershed infrastructure, and for larger soil and water conservation schemes where more than one community or group were involved. While these arrangements were participatory, they also required awareness-raising, capacities and knowledge to deal with the technical options and issues at stake; mediation of diverging interests was often needed. This model worked well for the sustainability of drinking water and sanitation and for sustainable land management.

24. **Infrastructure governance in fragile situations.** An extremely weak institutional environment in countries with fragile situations creates difficulties for the management of procurement processes that follow the normal procedures of international development agencies. This has contributed to implementation delays because of fiduciary risk aversion. Bypassing normal procurement and management processes can fuel corruption – which may itself have been a driver of conflict and undermined peacebuilding and state-building efforts. Equally, bypassing government systems in order to reduce the risk of corruption can lead to a lack of local ownership and hence affect sustainability and future maintenance arrangements. Sustainability of all forms of infrastructure is clearly the weakest link in countries with fragile situations where institutional and technical support, beneficiary capacity and financial resources for keeping infrastructure operational are in particularly short supply.

C. Conclusions

25. **IFAD infrastructure investments were relevant and overall effective in their contribution to poverty reduction.** Overall, infrastructure subprojects achieved the set targets but technical quality and arrangements for sustainability were often unsatisfactory. Outcomes and impact were better when different categories of infrastructure activities were combined and when they were matched with adequate capacity-building and stakeholder engagement early on. Infrastructure was more effective when designed at the right and manageable scale, integrated with complementary activities, and carried out with broad community participation. The provision of infrastructure has been demand-led but requires more attention to institutional delivery, governance and ownership arrangements for sustainability and impact.

26. **Ownership and multi-stakeholder capacity-building were important preconditions to ensure that infrastructure is well taken care of.** User participation has been critical for operation and sustainability but the engagement of local administrations was important, too. There has not been enough dedicated technical know-how, and sometimes insufficient priority, among IFAD's traditional government partners to support the ongoing transition from government-owned (and -maintained) infrastructure to more inclusive and stakeholder-owned models. Users' groups – the trademark IFAD model – tended to be too weak to fulfil the expected functions, and private sector participation in operation and maintenance has been rare. Institutional governance and capacity-building of users' associations

and farmers' groups at the community and local levels require longer-term engagement, incentives and clear transition and exit strategies. Last but not least, the transition from largely publicly provided storage to more market-oriented storage and processing facilities will require better engagement with private sector stakeholders.

27. **Water-related infrastructure has been an area of focus for IFAD; greater efforts are required to address efficiency and sustainability issues.** Drinking water has long been an essential part of IFAD-supported projects and it remains in high demand. The need for clean water remains a top priority of women and very poor people in most communities. Yet IFAD's investments in drinking water have plunged to almost zero in recent replenishments. Provision of water for crops and livestock is in high demand too, but innovative and more sustainable types of productive water use and irrigation systems are required. There is much scope to improve the efficiency and sustainability of water-related interventions, including irrigation. Water management and irrigation would benefit from closer attention to NRM and climate risks (climate-smart design) within landscape and watershed approaches. Integrated and multiple water use approaches would improve water use efficiency and climate resilience, and enhance the sustainability of productive water use and irrigation systems.

28. **Innovations and climate-smart infrastructure are important forward-looking and innovative themes** to contribute to the "next generation infrastructure" and related technologies, also in view of contributing to SDG 9 on innovation and infrastructure. There is increasing demand for this type of infrastructure – such as higher-quality submersible, concrete-reinforced roads, a larger variety of technical irrigation models to enhance water use efficiency in climate crises, renewable energy and more applications of digital infrastructure solutions. Climate-smart infrastructure includes broader watershed and landscape planning and complementary climate-smart technologies, and works for positive NRM/CCA objectives and related externalities. Renewable energy infrastructure decentralized to communities or households, mainly executed as pilots, deserves more attention for its multiple social and economic benefits, particularly for women, and its importance for NRM and climate resilience.

29. **In countries with fragile situations, infrastructure solutions require particularly long-term perspectives** in working with target populations over time; testing and advancing institutional capacities and concepts; and building-up reliable partnerships. In such situations, cofinanciers, the identification of new development partners (particularly civil society organizations), advocacy for IFAD's target groups and solutions are even more important as IFAD lacks the resources and traditional partners to address many infrastructure issues on its own. Policy dialogue with the government and other parties is often critical to facilitate enabling policies on ownership and land security; legal status and responsibilities of groups; institutionalizing government support services; and markets. In the end, sustainability of much of the rural infrastructure in fragile situations can only be achieved through increased government contributions, including those by local governments.

30. **IFAD has a positive track record and added value but it needs to step up its internal technical capacity and guidance** for the provision of infrastructure. IFAD is relatively experienced, mainly through tacit staff knowledge, in water and irrigation, roads/transport and social infrastructure. However, it lacks sufficient support for and attention to infrastructure in terms of specialized technical staff, safeguards, climate risk expertise and resources, and M&E capacity in design, implementation support and supervision. Hence, there is an urgency to reconcile IFAD's strategic infrastructure approach with its infrastructure support capacity.

31. **Demand for infrastructure investments in partner countries is expected to increase, particularly in middle-income countries** where the decreasing availability of concessional loans and grants drives the demand for productive investments. Such demand has already become visible in some countries that have moved from low- to middle-income status, such as Uganda. There is less willingness to borrow at close-to-market rates for soft infrastructure investments unless these are closely linked with hard infrastructure. IFAD's mandate and mixed performance in infrastructure suggest that some caution is needed in scaling up these investments. It will also require careful assessment of public and private partnerships and the associated costs and risks. Cofinancing partnerships were instrumental for IFAD to provide infrastructure at scale and to provide complementary hard and soft infrastructure parts. However, these partnerships often increased the transaction costs for both IFAD and its government partners.

32. **Above all, any IFAD niche in infrastructure and increased future borrowing for infrastructure need to stay closely linked to IFAD's mandate** to facilitate better access and sustainability for IFAD's core target groups and to minimize elite capture. This could include supporting small-scale irrigation schemes; tapping into larger infrastructure investments and schemes through cofinancing; enhancing access for the poor and for women; connecting to value chains; and effectively linking and phasing hard and soft infrastructure. IFAD's comparative advantage clearly lies in the provision of small-scale, climate-smart and pro-poor infrastructure in line with its mandate, but this needs to be articulated more clearly at the strategic level. Meeting the demand of IFAD's core target group also requires balancing the provision of productive and market infrastructure with infrastructure that caters for basic needs, such as drinking water.

D. Recommendations

33. **Recommendation 1. Prepare a corporate strategy to clarify IFAD's approach to scaling up pro-poor infrastructure**, including partnerships and systems for tracking the effectiveness and impact of these investments. The strategy would define the kind of infrastructure that IFAD is best placed to support, that is scalable and that would enable IFAD to better achieve its corporate objectives. Rehabilitation of existing irrigation is a common activity in IFAD's projects, but it is rarely sustainable. IFAD should decide the extent and conditions under which it will continue financing irrigation rehabilitation. The strategy would clarify options for resource acquisition and use, taking into consideration the time and transaction costs for partnership-building at the project level. Finally, the strategy will need to define a better approach to tracking the performance and results of infrastructure investments at the corporate level, including hard and soft infrastructure activities. The strategy should provide a common framework for IFAD; regional differentiations will be required to respond to the demand and capacity on the ground.

34. **Recommendation 2. Adopt a comprehensive approach to strengthening know-how and capacity for infrastructure support,** to cope with the increasing demand for rural infrastructure investments. IFAD infrastructure experts, capacity-building and knowledge management have to be strategically deployed at all levels to adequately support investments. Technical expertise (and staff) needs to be maintained at the headquarters level to oversee the preparation of knowledge products and guide the implementation of corporate policies and priorities at regional levels. IFAD should consider financing and facilitating the recruitment of qualified external assistance, when needed (such as through accredited consultants), and help its partners in countries to gradually build the relevant capacity. The growing demand for green infrastructure will require better alignment of corporate human and financial resources for CCA and SECAP.

35. **Recommendation 3. Strengthen attention to pro-poor infrastructure governance during design and implementation**; establish synergies with complementary investments, reforms and policy initiatives for enhanced

sustainability and impact. IFAD has corporate mechanisms to enhance the quality of infrastructure investments, but these have to be effectively used. Infrastructure requires proper institutional governance arrangements, enabling policy, legal and regulatory frameworks, and capacities to perform and deliver the expected benefits. Exit strategies deserve more attention from the outset. Community-based approaches and capacity-building for users' groups need to be better linked with existing institutional and policy frameworks for sustainability. Potential conflicts and trade-offs in the provision of public infrastructure goods (land and equality issues) need to be addressed more systematically through safeguards (something to be followed up by the Quality Assurance Group). The inclusiveness of the approach and the sustained benefits for poor men and women need to be monitored and reported through supervision, as do SECAP requirements and management plans.

IFAD Management's response[1]

1. Management welcomes the evaluation synthesis report (ESR) prepared by the Independent Office of Evaluation of IFAD (IOE) on IFAD's support to infrastructure. Management finds the report has covered the key challenges, and is relatively balanced. Management recognizes that the ESR presents relevant and useful findings for IFAD to better understand how to improve the effectiveness of its current and future infrastructure investments.

2. Management appreciates IOE's efforts to capture lessons on infrastructure and believes they are relevant to enhance IFAD's development impact and support to rural infrastructure development. As the evaluation synthesis is broad in its scope, in terms of infrastructure themes or intervention types covered (new or rehabilitation of social, productive and market access), there are inherent challenges in drawing conclusions and comparisons across the range of project types on strategic approach, performance and impacts, as well as governance and institutional arrangements2.

3. Management would also like to recognize the collaborative and participatory process during the preparation of this ESR, including in-house consultations, focus group discussions and e-surveys.

Recommendations

4. Management takes note of the three recommendations outlined in the ESR and overall is in full or partial agreement with most recommendations. Management's detailed response to each recommendation is provided below.

5. **Recommendation 1**: **Prepare a corporate strategy to clarify IFAD's approach to scaling up pro-poor infrastructure, including partnerships and systems for tracking the effectiveness and impact of these investments.**

   Partially Agreed: Management agrees with the need to enhance IFAD's corporate level guidance on rural infrastructure development and would explore the best way to address this need. Management has committed to strengthen the rural infrastructure dimensions of existing corporate and operational strategies and policies, such as the updated SECAP and the Integrated Project Risk Matrix, among others, to better mainstream the role of rural infrastructure to achieve the development objectives.

   In this context, Management believes that developing operational guidelines on IFAD's engagement in rural infrastructure to provide approaches for targeting, and prioritisation for rural infrastructure would be better suited for IFAD's operations. Operational guidelines could articulate the conditions for impactful financing and support the designing of a theory of change that would promote better monitoring and evaluation. Management notes that the ESR used the term sustainability and alluded to different dimensions of it at different points without necessarily distinguishing between sustainability of impact, of operations, or financial sustainability. These would be parsed for nuance when Management develops guidelines on rural infrastructure.

   Management has already started and will continue to enhance monitoring and evaluation tools and capacities to better track performance and results of rural infrastructure investments. Management will continue to improve the design quality

[1] The Strategy and Knowledge Department together with the Programme Management Department sent the final Management's response to the Independent Office of Evaluation of IFAD on 23 February 2021.

[2] The ESR could be clearer in all circumstances whether the performance rating/impacts presented are based on attribution or contribution, as this has implications on how lessons learned are interpreted and used to improve future operations. Systematic reviews of lessons on how rural infrastructure investments should be delivered and implemented could have benchmarked IFAD's performance better. Another related attribute of the synthesis is that the sample that has been collected is not random, and the extent to which the sample is representative of the overall population of projects is less clear.

of rural infrastructure heavy projects and set-up closer technical implementation support to achieve high quality outputs and outcomes.

6. **Recommendation 2: Adopt a comprehensive approach to strengthening know-how and capacities for infrastructure support, to cope with the increasing demand for rural infrastructure investments.**

Agreed: Management agrees with the need for strengthening internal know-how and capacities for rural infrastructure support. Management continues to evaluate the requirements of technical resources and has recently added a renewable energy and green infrastructure expert to the existing in-house technical resources, to be deployed to the field. Management would like to highlight, in agreement with the ESR observation, that this is being given increasing attention in the organization.

At the same time, considering the limited reach of IFAD's technical resources, Management is enhancing the collaboration with other United Nations technical agencies and development partners including IFIs on the development of communities of practice to provide technical support for the development of rural infrastructure.

Management will focus on ensuring that greater weight of such collaboration could be obtained at the field level so that technical expertise, knowledge and other resources could directly feed into project design, implementation support and supervision.

7. **Recommendation 3: Strengthen attention to pro-poor infrastructure governance during design and implementation; establish synergies with complementary investments, reforms and policy initiatives for enhanced sustainability and impact.**

Partially Agreed: Management concurs with IOE on the positive intention of this recommendation as a way to improve the impact of intervention on rural infrastructure. At the same time, Management would like to underscore the importance of undertaking scenario analyses that will examine the (necessary) trade-offs between all these objectives. Management notes that IFAD's rural infrastructure investments, by targeting the "last mile", are subject to placement bias that makes it a difficult sample to achieve both sustainability and impact. This is especially true for IFAD whose target beneficiaries are predominantly small rural producers who are less integrated with markets and value chains, and whose production patterns are a mix of being both subsistence oriented and market oriented.

Management will pay attention to project implementation reviews being better designed to help teams better identify appropriate strategies for enhancing safeguards and sustainability of rural infrastructure projects from the start. For instance, the current practice that supervision missions are not expected to report on exit strategies until past mid-term review may require further review. Another example is the good practice of including quality assurance during implementation at project level for infrastructure as recommended in the How-to-do-note on irrigation. Management will also consider these issues in light of the broader sustainability action plan, planned to be delivered as an IFAD12 commitment by end 2021.

Beneficiaries of the Rural Livelihoods and Economic Enhancement Programme in Malawi. The construction of this milk collection point was financed by IFAD, while the bulk milk cooling tank was provided by UK Aid.

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Infrastructure at IFAD (2001 – 2019)
Evaluation Synthesis

I. Introduction

A. Background

1. The Independent Office of Evaluation of IFAD (IOE) prepares evaluation synthesis reports (ESRs) with the aim of capturing accumulated knowledge and experiences from IFAD and other international financial institutions (IFIs) for a theme selected through consultations with IFAD's evaluation committee and management. "Infrastructure" was selected as a topic for the 2020 ESR because it reflects the mutual interest and engagement of these stakeholders. Moreover, infrastructure constitutes a significant share of IFAD's investment (about 30 per cent), and there is growing demand for IFAD's support in this area.

2. **The Sustainable Development Goals (SDGs)** include a specific goal related to infrastructure: SDG 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. However, infrastructure also contributes – directly and indirectly – to the achievements of all SDGs.[1] Significant investments into infrastructure will be needed to achieve the SDGs. A 2019 World Bank report found that low- and middle-income countries would have to spend from US$637 billion (2 per cent of their GDP) to US$2.74 trillion (8 per cent of their GDP) in new SDG-related infrastructure depending on the spending efficiency and the quality of services delivered (World Bank Group, 2019). In addition, these countries would need to spend between 1.9 and 3.8 per cent of GDP per year to maintain their existing and new infrastructure. Improving the efficiency of infrastructure investment is an important element that will facilitate meeting the SDGs, especially in low-income countries (LICs) where resources are limited (The International Finance Corporation, 2019).

3. In the context of the SDGs, "last-mile" infrastructure and services, reaching out to the remotest places and those at risk of being left behind, have received particular attention (United Nations Development Programme [UNDP], 2016). This is also the type of infrastructure traditionally supported by IFAD, in addition to community-based infrastructure (see below).

Box 1
Infrastructure - definitions and terms

Infrastructure is broadly defined as: "the basic systems and services, such as transport and power supplies, that a country or organization uses in order to work effectively."*

Hard infrastructure refers to key physical networks for the functioning of advanced economies, particularly in energy, transport/logistics, water and communication.

In contrast, **soft infrastructure** refers to support systems that are more driven by institutions, services, regulations and public governance systems. The "soft" infrastructure elements include all essential institutional and governance aspects required to make the hard infrastructure functional, effective and sustainable.

Last mile (or first mile from farmers' perspective) refers to the infrastructure by connecting poor and remote communities to larger networks (e.g. to telecommunications, roads, irrigation or electricity).

Community-based infrastructure refers to local infrastructure, often collectively planned, managed and owned (e.g. village water supplies, rural roads and tracks, village grain banks, roofed markets, meeting halls, schools and clinics). Community-based infrastructure requires up-front investments in building capacities for operation and

[1] Infrastructure is required for SDG 3 (health), SDG 4 (education), SDG 6 (clean water and sanitation) and SDG 7 (affordable and clean energy). Infrastructure contributes to SDG 1 (no poverty), SDG 2 (no hunger) and SDG 5 (gender equality), which are at the core of IFAD's mandate.

maintenance, but the benefits include enhanced social capital and community organizations.

Green infrastructure refers to natural systems such as forests, floodplains and soils that can contribute to clean, reliable water supply, protect against floods and drought, or provide other ecological/ecosystem services.

Combining this "green infrastructure" with traditional "**grey infrastructure**," such as dams, levees, reservoirs, treatment systems, and pipes, could provide next-generation solutions that enhance infrastructure system performance, better protect communities, and ensure resilience.

*Cambridge University Press, *Cambridge Dictionary* (2021). https://dictionary.cambridge.org/dictionary/english/infrastructure.
Source: ESR compilation.

4. **Infrastructure in IFAD.** While infrastructure has always been an important part of IFAD's portfolio, its role has become even more significant in IFAD's latest strategy. The IFAD Strategic Framework 2016-2025 sees "enormous potential" in infrastructure investments. Investments into rural infrastructure are seen as key in supporting IFAD's increasing focus on agricultural commercialization and market access. In IFAD's strategic objectives (SOs), rural infrastructure is listed as a specific area of "thematic focus" for SO2 (to increase poor rural people's benefits from market participation) in the framework. Moreover, infrastructure (indirectly) also contributes to the other SOs. Social and productive infrastructure helps to increase poor rural people's productive capacities (SO1). Investments into land and water conservation structures and climate-proof infrastructure help to strengthen the environmental sustainability and climate resilience of poor rural people's economic activities (SO3). Box 1 summarizes the basic infrastructure definitions, terms and sector categories as used at IFAD and in this ESR.

5. Investments into infrastructure (see box 2) constitute a significant share in IFAD's portfolio**.** Between 2001 and 2019, US$6.972 billion, about 30 per cent of all approved IFAD funding, went towards the construction of new infrastructure or the rehabilitation of existing infrastructure, primarily into irrigation, drainage and water management, roads and other transport infrastructure, and post-harvest and market facilities (see chapter II.B). In addition, IFAD has invested into institutional development and capacity-building to ensure that smallholder farmers are able to manage and maintain the infrastructure built, for example, through the support of water users' associations (WUAs). In many cases, these investments have been possible because of the cofinancing partnerships with other international development partners.

Box 2
IFAD Infrastructure categories*

Production infrastructure includes: irrigation and drainage; livestock shelters, water points and fishery ponds; post-harvest storage; and other production-related infrastructure (e.g. water harvesting).

Access to market infrastructure covers: marketplaces and market storage; processing facilities and value addition infrastructure; and access roads and transport services.

Social infrastructure mainly refers to investments in health, drinking water, sanitation, education and energy.

Natural resources management and climate change adaptation infrastructure covers soil and water management structures, and climate-smart infrastructure investments.

*See annex IV for details on infrastructure categories and definitions.
Source: see annex IV.

B. Lessons from international development partners

6. The levels of engagement in agriculture and rural development, and the types of infrastructure provided by other development partners, particularly IFIs, differ

significantly from IFAD's support. They are commonly larger in scale, more sector-wide and less community- and target-group-oriented. However, there are a number of similar experiences and lessons that provide important context for IFAD and this ESR.

7. **Engagement of IFIs in agriculture.** With the increasing importance of other sectors over time, agriculture has fallen a bit by the wayside in other IFIs, although several re-engaged in the sector after the food price crisis of 2007-2008. However, staffing, skills and resources were hardly sufficient (Asian Development Bank [ADB], 2018; Inter-American Development Bank [IDB], 2015) and resulted in relatively low, scattered and often non-satisfactory agriculture infrastructure investments. The IDB limited its agriculture infrastructure to some public and private sector support for warehouses and processing plants and to irrigation in poorer countries, such as Haiti (IDB, 2015). The African Development Bank (AfDB) saw its largest decline in investments in agriculture (AfDB, 2016), with most infrastructure now going to transport, energy, water and sanitation.

8. **Stronger complementarities.** For the ADB, a sector as complex as agriculture, rural development and natural resources warranted a more holistic approach, to be supported by greater resources and staff skills that could contribute more fully to the complete agriculture value chain (ADB, 2018). This also meant expanded collaboration and partnerships with recognized centres of excellence to complement current staff resources and supplement skills shortages, and with organizations such as IFAD and the Food and Agriculture Organization of the United Nations (FAO). A recent World Bank report emphasized complementary investments into people, institutions and research, including engagement across multiple ministries and agencies, covering water, energy and other infrastructure sectors (World Bank, 2018).

9. **Consistent application of safeguards.** Recent ADB (2020), AfDB (2019) and IDB (2018) evaluations of safeguards have all reported problems for safeguards at design and during implementation, with environmental and social risk and impact assessments (ESIAs) and ESIA management not being well integrated into overall design and project management, incomplete assessments, and failure to consult with affected communities. Follow-up of safeguards during project implementation were found to be particularly lacking. Most safeguards systems have been heavily front-loaded, with lots of effort and resources spent before board approval, and few staff and little time to ensure supervision support with the required skills. Safeguards issues can be adequately addressed during project implementation, even if not all ESIA analyses and related consultations are completed to required standards before loan approval. If a clear framework and timetable are established to guide the remaining work, sufficient project funds are set aside to handle safeguards issues and there is close follow-up by the bank during implementation (IDB, 2018).

10. **Stronger capacities for water management.** For the ADB, the poor performance of its large irrigation subsector with a 47 per cent "successful" rate is a concern (ADB, 2018). A recent independent evaluation by the World Bank on service delivery in the irrigation sector showed weak results as investments continued to focus too much on hard infrastructure, and problems continued with sustainability despite years of efforts to transfer management responsibility from public to private organizations (World Bank, 2019). The inadequate capacity of WUAs, in terms of adequately managing water resources and claiming ownership, was emphasized by the AfDB (AfDB, 2020). Reasons included the low financial base, poor organization and management of service charges and revolving loans, and takeover by individuals or groups of individuals of critical water supply, and subsequent destabilization of systems. Technically, low performance and outcomes were mainly caused by insufficient development of tertiary canals, incomplete land development for irrigation, quality of preparatory studies and design, and lack of complementary production inputs.

11. **More attention to strategic market issues.** For market infrastructure, insufficient ownership, poor planning and limited functionality often led to low support by local producers and private sector actors. Facilities ended up being underutilized, with no clear sustainability mechanism in place (AfDB, 2019). The ADB emphasized that infrastructure would have to be very specific to the value chain needs and that the placement of markets and storage facilities was critical for value chain development (ADB, 2013). Rural roads could be helpful for competitive value chains if attention is paid to linking high-value crop production areas to strategic commercial markets of both outputs and inputs.

12. **Better sustainability.** At the AfDB, financial and economic viability was the main factor limiting infrastructure sustainability (AfDB, 2016). Sustainability was also the lowest-rated criterion of agriculture projects for the ADB (ADB, 2018). The World Bank irrigation service delivery evaluation (World Bank, 2019) was very critical of the adequacy of policy reforms in many countries to promote financial sustainability of irrigation schemes and to ensure adequate operation and maintenance (O&M) and a service delivery perspective. Neglect of system O&M for public irrigation schemes has led to what is appropriately described by the practice as "design, neglect and rebuild." Some international development agencies have introduced more or less detailed concepts and checklists for better sustainability of infrastructure, such as IDB (2018).

13. **Stronger monitoring and evaluation.** The importance of quality and functional monitoring and evaluation (M&E) systems to support project development effectiveness and capture lessons for replication and scaling up of innovative solutions was reiterated and prioritized as one of five key lessons in the AfDB cluster evaluation of water management (AfDB, 2020).

14. **Performance and impacts.** Poorly executed infrastructure projects will not achieve the intended poverty reduction results, a point made in a report by the United Nations Development Programme that is still valid 15 years afterwards: "The links between infrastructure, growth and poverty reduction are not automatic and numerous infrastructure projects have been affected by poor rationale, lack of proper feasibility studies or cost-benefit analysis and inadequate provision for operations and maintenance. Infrastructure benefits have often not been translated into improvements in the lives of poor people – partly because of design problems, partly because of the non-participation of poor people in formulation and implementation, partly because of adverse social and environmental impacts and largely because the initiatives were not local and community-based" (UNDP, 2005).

15. **Lessons presented in the ESR.** This ESR refers to these and other lessons and findings throughout the report. The findings from other IFI evaluations are more comprehensively presented in annex X.

C. Objectives and scope

16. **Objectives.** The ESR objectives were:

    (i) Provide a conceptual framework clarifying the contribution of infrastructure to IFAD's SOs.

    (ii) Review IFAD's strategic positioning, comparative advantage and partnerships in the provision of infrastructure.

    (iii) Assess the relevance, coherence, effectiveness, efficiency and impact of IFAD infrastructure investments.

    (iv) Examine the extent to which IFAD-supported infrastructure addresses issues of sustainability, climate resilience and innovation.

    (v) Identify good practices and lessons learned.

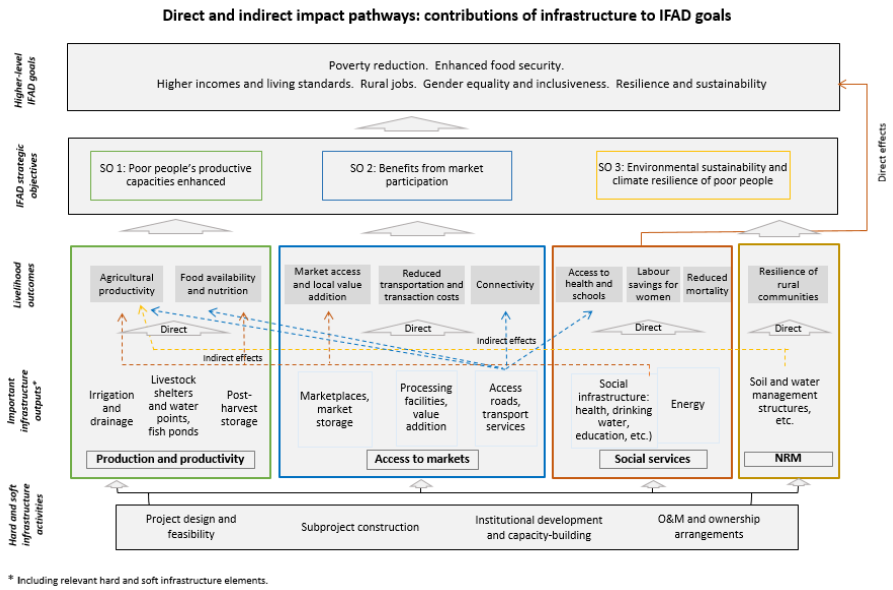
17. **Scope.** The synthesis covers the period since 2001 (from the Fifth Replenishment of IFAD's Resources [IFAD5] to the Eleventh Replenishment of IFAD's Resources [IFAD11]), which coincides with the broader shift from community-based to value chain approaches.[2] The review covers all categories of IFAD infrastructure investments, including production, markets, natural resources management (NRM) and social infrastructure. In addition to the overall review of infrastructure performance in IFAD (chapters III-V), the synthesis pays specific attention to themes that were of strategic importance for IFAD during the review period, such as infrastructure for access by smallholder farmers to markets and value chains, NRM and climate change adaptation (CCA), and infrastructure in states with fragile situations (chapter VI).

D. Analytical framework

18. **Theory of change.** Figure 1 shows the theory of change developed for this synthesis. It illustrates two main assumptions for impact that have informed the analysis in this report. First, infrastructure directly and indirectly contributes to poverty reduction and other IFAD goals. Second, (hard) infrastructure needs to be complemented by institutional development and capacity-building in order to achieve the desired poverty impact.

19. The theory of change links infrastructure outputs and outcomes to IFAD's SOs and higher-level goals. It can be summarized as follows. Well-implemented infrastructure subprojects result in effective physical structures and permanent installations alongside functioning management and institutional arrangements (outputs); the improved access to markets and/or to health and social welfare leads to improved livelihoods, thus contributing to IFAD's SOs. The impact that these structures have on IFAD's target groups, women and men, would vary.

Figure 1
Theory of change for IFAD infrastructure impact (as developed by this ESR)



Source: ESR compilation.

[2] The ESR on community-driven development (CDD) (2019) has extensively covered the previous period, where infrastructure was mainly provided through community-based approaches.

E. Methodology

20. The main review questions were:

(i) How well is IFAD set up (strategically, institutionally and in terms of capacity) to address the demand for infrastructure by providing (or leveraging) the financial and technical support required to properly plan, manage and supervise projects with significant infrastructure investments?

(ii) How does infrastructure, within project-level theories of change, contribute to higher-level outcomes and impacts, such as poverty reduction and inclusive development? How can impact be most effectively, efficiently and sustainably achieved through special attention to smallholder commercialization, markets and value chains in infrastructure design and operations?

(iii) What is required, in terms of funding, capacity-building and institutional arrangements, to make IFAD-funded infrastructure effective and sustainable for rural poor people in the longer term?

21. The detailed review questions are included in the review framework in annex I.

Review sample

22. The synthesis drew its evaluative evidence from the following samples:

(i) A sample of 35 projects evaluated by IOE was used to review the portfolio performance of infrastructure interventions. During IFAD5-11, the IFAD portfolio included 379 projects with at least one infrastructure subcomponent, out of which 166 had been evaluated by IOE at the time of this synthesis.

(ii) In addition, 10 projects were selected as case studies, which included ongoing and completed projects with significant infrastructure components. These projects were identified in consultation with the regional divisions.

(iii) In order to cover the strategic and partnership issues at country level, the ESR also identified the 10 country portfolios with the highest investments in infrastructure.

23. **Project sample for performance review.** The project sample selection focused on projects that had a significant share of their budget allocated to infrastructure (30 per cent). The final sample included 35 projects that had been evaluated by a project or country evaluation.[3] Table 1 shows the sample composition across the IFAD regions; it also indicates the sample projects in states with fragile situations.

Table 1
Sample of projects covered through IOE evaluations, by IFAD region

Type of evaluation	*APR*	*ESA*	*LAC*	*NEN*	*WCA*	*Total*	*Covering states with fragile situations*
Project evaluations (IE, PE, PPA, PPE)	5	5	0	7	4	23	2
Country evaluations (CPE/CSPE)	9	1	0	2	2	15	0
Total	15	6	0	9	6	35	2

Notes: APR: Asia and the Pacific; ESA: East and Southern Africa; LAC: Latin America and the Caribbean; NEN: Near East, North Africa and Europe; WCA: West and Central Africa.
IE: impact evaluation; project evaluation; PPA: project performance assessment; PPE: project performance evaluation.
CPE: country programme evaluation; CSPE: country strategy and programme evaluation.
Source: ESR compilation.

[3] The sampling methodology is described in the approach paper for this synthesis.

24. **Case studies.** Case studies for in-depth review of selected issues were selected in consultation with the regional divisions.[4] The case study selection considered projects in countries with fragile situations, as well as various types of infrastructure and regional distribution. The case study exercise included an in-depth documents review (evaluation reports, studies and project completion reports [PCRs]) complemented by interviews with resource persons (e.g. country programme managers [CPMs]) where further information was required. The case studies covered contextual and strategic aspects, such as infrastructure intervention strategy, implementation arrangements, ownership, and O&M models, infrastructure performance and results, as well as sustainability and scaling up.

25. **Country strategy and programme evaluation sample.** A sample of country strategy and programme evaluation (CSPEs) of the "Top Ten" countries in terms of infrastructure investments (see table 2) provided additional information on IFAD's strategic approach in these countries, in particular the rationale for the strategic focus on infrastructure, the contextual factors and the main partnerships (with government and international partners) driving this focus.

Table 2
Top Ten countries for IFAD's investments in infrastructure (2001-2019)

Country	*Amount of infrastructure investment (US$ million)*	*% of total portfolio investment*
Indonesia	620.2	9.0
Bangladesh	488.8	7.1
Uganda	318.8	4.6
Nigeria	263.8	3.8
Egypt	207.9	3.0
China	189.0	2.7
Niger	181.2	2.6
Afghanistan	175.0	2.5
Cambodia	172.7	2.5
Democratic Republic of the Congo	160.1	2.3

Source: ESR compilation.

Additional sources of evidence

26. **Interviews and focus group discussions.** Interviews and focus groups with (former) CPMs and technical advisers/consultants provided additional insights into the factors contributing to success or failure. The discussions informed the elaboration of the theory of change. The process for this synthesis included six focus group discussions (FGDs) on selected topics, which included two stakeholder discussions in countries where IFAD has sizeable infrastructure investments (Indonesia and Nigeria). The FGDs provided feedback on selected issues of strategic importance, such as IFAD's comparative advantage, safeguards and partnerships. There was also a joint IOE/Research and Impact Assessment Division (RIA) FGD to explore the impact of infrastructure supported by IFAD.

27. **E-survey.** The synthesis review also comprised an e-survey, which was implemented from 18 May to 1 June 2020 using the online platform SurveyMonkey.

[4] The IOE team working on the ESR had first requested the regional divisions and the infrastructure technical specialists to propose closed or ongoing projects as case studies. Once this information was received, the nominated (25) projects were screened for their potential to yield informative case studies for the ESR. Projects were prioritized for which evidence of results was available (e.g. evaluations, project completion reports [PCRs], mid-term review [MTR] reports, and Research and Impact Assessment Division [RIA] impact assessments). The final list of 10 case studies appears in annex II.

Around 300 people[5] responded to questions and assigned ratings regarding IFAD's support for rural infrastructure, including IFAD's comparative advantage for infrastructure investments, cofinancing partnerships, common issues and sustainability, and climate, pro-poor and gender impacts. About 40 per cent of respondents were consultants, 23 per cent IFAD staff, 18 per cent government officers, 11 per cent staff of NGO partners, and 9 per cent international development partners. The outputs of the survey were used as inputs for the FGDs and to stimulate discussions around the various topics of interest. The survey provided ample space for qualitative feedback, which is presented in various parts of this report. The key results are provided in annex III.

28. **Evidence from other development agencies.** The synthesis reviewed key lessons from other IFIs and development partners. These were approached – and presented – in a selective manner, focusing on key lessons that relate to the findings and observations emerging from the synthesis. Chapter VII presents the lessons from IFIs according to the themes reviewed in the different chapters of this report. Among IFIs' independent evaluation departments, most synthesis reports or thematic/meso-level evaluation of immediate interest for this ESR can be found in regional IFIs (see annex X). The World Bank Group's Independent Evaluation Group has done some limited synthesis evaluations over the past decade (for agriculture mainly on irrigation services, and some broader infrastructure evaluation in other sectors) and planned an evaluation on "agricultural transformation" for 2020. In addition, useful information for this ESR was found in reports by UNDP, the CGIAR system and FAO.

Method for sample analysis

29. The sample of 35 projects was carefully and systematically reviewed in line with relevant lead questions in the evaluation matrix (see annex 1). The analysis defined a number of structural, explanatory and performance indicators, with a focus on results indicators. Detailed scoring criteria and prompting questions were developed for each of the performance indicators. For each of the 35 projects, the analysis identified all infrastructure activities and their shares in total costs by macro category (the major four infrastructure sectors) and subcategories, based on information in the evaluations, and compared them with the summary statistics in the Operational Results Management System.

30. The relevant information obtained from project performance evaluations (PPEs) and CSPEs was coded and entered into a portfolio review matrix for each infrastructure activity (by subcategory as far as possible). Performance was scored for each activity, or for groups of activities, depending on available information. Detailed background information and justifications were recorded for the scoring of infrastructure activities for each project. Information was analysed at both activity and project level across projects. For some variables, activity-level information was aggregated to project level to facilitate analysis, weighted according to its share in total project infrastructure costs. Summary statistics were produced mainly as frequencies and averages, with particular attention being paid to outliers in performance, on both the positive and negative ends.

Limitations

31. The synthesis specifically focuses on the complementarity between hard and soft infrastructure, the institutional arrangements required to make infrastructure perform and achieve infrastructure impact. The extent to which these are described in IOE evaluations varies. Therefore, additional information had to be collected through case studies, drawing from interviews and project documents. Other sources of information that complemented the IOE evaluations were, in particular, the RIA impact assessments and the PCRs or mid-term reviews (MTRs).

[5] From among 1,664 external addressees to whom the request for survey participation had been sent, in addition to all IFAD employees of its Programme Management Department, Strategy and Knowledge Department and all country offices via the respective unit e-mail lists; moreover, the link to the survey was also posted on IFAD's intranet.

32. Small infrastructure interventions are a common feature in IFAD's infrastructure portfolio, but they are often "hidden" within the subcomponent classification and therefore difficult to identify. The case studies proposed by the divisions are therefore a useful way to identify small but significant infrastructure interventions that might provide important lessons for this synthesis (e.g. Brazil and Chad).

33. The review of evaluations and studies conducted by other IFIs yields some important insights and lessons. A major limitation is that the types of infrastructure provided by other IFIs are different. Findings were therefore extracted in a selective manner and as deemed relevant for the typical IFAD-supported interventions.

34. Therefore, the synthesis made extensive used of virtual focus groups and online surveys for stakeholder feedback and engagement. These formats enabled broad-based feedback from IFAD staff and other stakeholders, including those based in partner countries (see annexes III and IX).

F. Overview of sample projects

35. **Project types.** The ESR sampled 35 projects that included more than 30 per cent of project funds committed to infrastructure. Seven projects were classified as "small" (less than US$20 million), and three as "very large" (more than US$65 million).

36. The review sample includes 7 community-driven development (CDD) projects,[6] 10 community-based projects, and 12 projects with a focus on production and markets. In addition, five projects were classified as infrastructure-heavy because of their exceptionally high share of infrastructure (> 70 per cent) (see table A4.1.):

    (i) **CDD projects** were usually under the full control of communities. The projects typically included a community development fund, which finances a range of activities, including infrastructure, as prioritized by the communities.[7]

    (ii) **Community-based projects** also had a strong focus on community development (e.g. a dedicated component on community development), but **project** offices (e.g. based in local government) were usually more involved in the planning and management of the infrastructure.

    (iii) **Production- and market-focused projects** focused on a narrower set of – **production**- and market-oriented – infrastructure activities. They usually targeted farmers' groups and other stakeholders involved with certain types of land use or commodities.

    (iv) **Infrastructure-heavy projects** were identified because of the high share of **infrastructure** (70 per cent) included in the budget. They may overlap with the above types, but are characterized by their almost exclusive focus on infrastructure.

37. **Infrastructure activities.** The review covered a broad range of infrastructure activities. Transport provided the largest share of infrastructure activities in the project sample (29 per cent of activities), followed by drinking water and sanitation (20 per cent), and irrigation (19 per cent). The CDD and community-based projects included the largest range of infrastructure activities, including social and productive infrastructure. Almost all CDD projects included drinking water, irrigation and roads. Energy was also more frequently found in CDD and community-based projects than in other project types. In production- and market-focused projects, transport and irrigation were most common. Other common activities included markets, livestock/fishery, and post-harvest infrastructure. This project type did not include

[6] Within the sample of this ESR, seven projects were identified as CDD: Cambodia (#24); Mauritania (#13); Nigeria (#15); Pakistan (#16); Nepal (#27); Rwanda (#17); Viet Nam (#35). In addition, Brazil (#43) was a classical CDD project covered through a case study.

[7] This ESR follows the definition used by the ESR CDD (2019). This defines CDD as those projects that had a community development fund, managed by communities.

social infrastructure (except drinking water). Infrastructure-heavy projects included a mix of economic and social infrastructure (but no health infrastructure; see table A4.2. on presence of infrastructure activities in project types).

38. **Project financing.** The average project size ranged between US$29 million and US$44 million. CDD projects were the largest on average and included a larger share of domestic cofinancing (on average 37 per cent). The projects classified as infrastructure-heavy (> 70 per cent infrastructure) were of similar size, but had a slightly lower share of domestic cofinancing. The average share of international cofinancing was between 22 and 24 per cent, except for the CDD projects, for which it was only 7 per cent (see table 3).

Table 3
Total project costs and percentage IFAD, domestic and international cofinancing

	Community-driven development	*Community-based*	*Production and markets*	*Infrastructure-heavy*
Total project cost (as average; in US$ million)	44.58	33.96	29.89	43.55
IFAD financing (as average; in %)	56%	48%	56%	45%
Domestic cofinancing (as average; in %)	37%	29%	22%	32%
International cofinancing (as average; in %)	7%	24%	22%	24%

Source: Grants and Investment Projects System (GRIPS).

39. **Case studies.** Ten case study projects were selected, with the coverage of the main typologies of infrastructure being the main selection criterion. Only 2 of the 10 projects are ongoing (The Gambia [#46] and Georgia [#44]). Three of the countries are in the "fragile" category: Burundi, Chad and The Gambia. During the analysis, it became clear that the sample did not have projects where the private sector played an important role in financing and/or O&M of infrastructure. All the 10 projects were category B in terms of environmental risks. A number of projects had basic social services infrastructure, often supporting safe drinking water and sanitation. Only one project had pastoral hydrostructures (Chad [#45]).

40. **List of projects.** Table 4 lists the projects sampled for qualitative review or case studies. The reference number (#) is used throughout the report to refer to the projects. A table with basic data for each project is included in annex II.

Table 4
List of projects sampled for qualitative review (QR) and case study (CS), by region

IFAD region	*Country*	*Project name*	*QR/ CS*	*Ref. no.*
APR	Bangladesh	Coastal Climate Resilient Infrastructure Project (CCRIP)	CS	#40
APR	Bhutan	Agriculture, Marketing and Enterprise Promotion Programme (AMEPP)	QR	#3
APR	Cambodia	Rural Poverty Reduction Project (Prey Veng and Svay Rieng) (RPRP)	QR	#24
APR	China	Sichuan Post-Earthquake Agriculture Rehabilitation Project (SPEARP)	QR	#26
APR	China	Guangxi Integrated Agricultural Development Project (GIADP)	CS	#41
APR	Lao People's Democratic Republic	Oudomxai Community Initiatives Support Project (OCISP)	QR	#9
APR	Lao People's Democratic Republic	Rural Livelihoods Improvement Programme in Attapeu and Sayabouri (RLIP)	QR	#10
APR	Madagascar	Project to Support Development in the Menabe and Melaky Regions (AD2M)	CS	#47

IFAD region	*Country*	*Project name*	*QR/ CS*	*Ref. no.*
APR	Nepal	Western Uplands Poverty Alleviation Project (WUPAP)	QR	#27
APR	Pakistan	Community Development Programme (CDP)	QR	#16
APR	Pakistan	North West Frontier Province Barani Area Development Project (NWFP BAPD)	QR	#28
APR	Philippines	Irrigated Rice Production Enhancement Project 2009-2015 (IRPEP) of the Rapid Food Production Enhancement Programme 2009-2016 (RaFPEP)	CS	#49
APR	Sri Lanka	Dry Zone Livelihood Support and Partnership Programme (DZ-LiSPP)	QR	#30
APR	Sri Lanka	Post-Tsunami Livelihoods Support and Partnership Programme (PT-LiSPP)	QR	#31
APR	Sri Lanka	Iranamadu Irrigation Development Project (IIDP)	QR	#32
APR	Sri Lanka	Iranamadu Irrigation Rehabilitation Project (IIRP)	CS	#48
APR	Viet Nam	Rural Income Diversification Project in Tuyen Quang Province (RIDP)	QR	#35
ESA	Burundi	Rural Recovery and Development Programme (PRDMR)	CS	#42
ESA	Kenya	Smallholder Horticulture Marketing Programme (SHoMaP)	QR	#8
ESA	Madagascar	Project to Support Development in the Menabe and Melaky Regions (AD2M)1	QR	#11
ESA	Malawi	Rural livelihoods economic enhancement programme (RLEEP)	QR	#38
ESA	Mozambique	Sofala Bank Artisanal Fisheries Project (SBAFP)	QR	#36
ESA	Rwanda	Kirehe Community-based Watershed Management Project (KWAMP)	QR	#17
ESA	Rwanda	Umutara Community Resource and Infrastructure Development Project (PDRCIU)	QR	#29
ESA	United Republic of Tanzania	Agricultural Marketing Systems Development Programme (AMSDP)	QR	#19
LAC	Brazil	Rural Communities Development Project in the Poorest Areas of the State of Bahia (Gente de Valor)	CS	#43
NEN	Armenia	Rural Areas Economic Development Programme (RAEDP)	QR	#1
NEN	Azerbaijan	North East Rural Development Project (NDP)	QR	#2
NEN	Georgia	Agricultural Support Project (ASP)	QR	#7
NEN	Georgia	Agriculture Modernization, Market Access and Resilience Project (AMMAR)	CS	#44
NEN	Morocco	Rural Development Project in the Eastern Middle Atlas Mountains (PDRMO)	QR	#14
NEN	Sudan	Gash Sustainable Livelihoods Regeneration Project (GSLRP)	QR	#18
NEN	Tunisia	Programme for Agro-pastoral Development and Promotion of Local Initiatives in the South-East (PRODESUD)	QR	#33
NEN	Tunisia	Integrated Agricultural Development Project in the Governorate of Siliana-Phase II (PDAI Siliana II)	QR	#34
NEN	Turkey	Sivas – Erzincan Development Project (SEDP)	QR	#20
NEN	Turkey	Ardahan-Kars-Artvin Development Project (AKADP)	QR	#37
WCA	Burkina Faso	Sustainable Rural Development Programme (PDRD)	QR	#22
WCA	Burkina Faso	Small-scale Irrigation and Water Management Project (PIGEPE)	QR	#23
WCA	Cameroon	Community Development Support Project (PADC)	QR	#25
WCA	Chad	Pastoral Water and Resource Management Project in Sahelian Areas (PROHYPA)	CS	#45

IFAD region	*Country*	*Project name*	*QR/ CS*	*Ref. no.*
WCA	Democratic Republic of the Congo	Agricultural Rehabilitation Programme in Orientale Province (PRAPO)	QR	#6
WCA	Gambia	National Agricultural Land and Water Management Development Project (NEMA)	CS	#46
WCA	Mauritania	Poverty Reduction Project in Aftout South and Karakoro (PASK)	QR	#12
WCA	Mauritania	Oasis Sustainable Development Programme (PDDO)	QR	#13
WCA	Nigeria	Community-based Agricultural and Rural Development Programme (CBARDP)	QR	#15

Note*:* APR: Asia and the Pacific; ESA: East and Southern Africa; LAC: Latin America and the Caribbean; NEN: Near East, North Africa and Europe; WCA: West and Central Africa.
Source*:* ESR compilation.

G. Structure of this report

41. Findings from this synthesis are presented in five chapters. Their sequence follows the different levels of the theory of change, from the bottom upward (chapters II-V). Chapter VI, the final before the conclusions and recommendations, presents important issues that cut across those levels. At the end of each chapter, there are lessons or conclusions emerging from the particular chapter as well as the key points summarizing the more important findings:

(i) Chapter II presents the findings on corporate-level issues, which are related to IFAD's strategic approach to infrastructure, the infrastructure portfolio and the corporate capacity, knowledge, and M&E systems in relation to infrastructure. It concludes with an overview of the key factors driving investments into infrastructure at IFAD, and the emerging demand for infrastructure focus in line with IFAD's mandate and comparative advantage.

(ii) Chapter III discusses the performance of (hard and soft) infrastructure found in the project sample, using standard evaluation criteria (effectiveness, efficiency, targeting and gender, O&M, and sustainability). The chapter specifically looks at user participation and ownership, and how stakeholder roles perform in different institutional arrangements.

(iii) Chapter IV further discusses the performance of government partners and international cofinancing partners. It highlights some of the institutional challenges and bottlenecks that need to be addressed in order to improve performance.

(iv) Chapter V presents findings from RIA and the ESR case studies on rural poverty impact and gender equality. It emphasizes the interconnectedness of infrastructure interventions and complementary (soft) activities, such as training and capacity-building, for more sustainable and transformative impact.

(v) Chapter VI discusses the main themes that are of strategic concerns for IFAD and were also highlighted as priority interests during the ESR FGDs and interviews. These are: infrastructure for smallholder market access and value chains; infrastructure for NRM and CCA; and infrastructure in countries with fragile situations.

(vi) The report closes with the conclusions and recommendations (chapter VII).

Key points (chapter I)

- The **main review questions** are:
- How well is IFAD set up (strategically, institutionally and in terms of capacity) to address the demand for infrastructure by providing (or leveraging) the financial and technical support required to properly plan, manage and supervise projects with significant infrastructure investments?
- How does infrastructure, within project-level theories of change, contribute to higher-level outcomes and impacts, such as poverty reduction and inclusive development? How can impact be most effectively, efficiently and sustainably achieved through special attention to smallholder commercialization, markets and value chains in infrastructure design and operations?
- What is required, in terms of funding, capacity-building and institutional arrangements, to make IFAD-funded infrastructure effective and sustainable for rural poor people in the longer term?
- The synthesis covers the period since 2001 (IFAD5-11), which coincides with the broader shift from community-based to value chain approaches.
- The synthesis draws evidence from a sample of 35 projects (with more than 30 per cent of the budget allocated to infrastructure) and 10 case studies. Several of the case studies had used evidence collected through RIA impact assessments. Two case studies covered ongoing projects.
- Additional evidence comes from 10 CSPEs for the countries where IFAD had most of its infrastructure investments over the review period.
- The synthesis includes stakeholder feedback obtained through interviews, FGDs and an e-survey.

II. Findings on corporate-level strategies and capacities

A. IFAD strategic approach and positioning

Strategic approach

42. Infrastructure is omnipresent in IFAD's strategies and operations, although – as a distinct investment instrument – it has received relatively little attention. For example, IFAD does not have an infrastructure policy or a dedicated infrastructure strategy other than the safeguards of the Social, Environmental and Climate Assessment Procedures (SECAP). Nor does IFAD have sector-specific policies or strategies, for example, on water. However, infrastructure is referred to as a key ingredient to achieve IFAD's SOs.

43. The **IFAD Strategic Framework 2016-2025** suggests directing priorities to productive rural infrastructure, in particular, irrigation, roads, energy, communication, networks, storage and markets. It specifically mentions farm-to-market roads, storage facilities and marketplaces as well as infrastructure support for the rural financial sector. This underlines the increasing importance IFAD pays to infrastructure as a way to achieve better market access, beyond other objectives.

44. **Earlier strategic frameworks were less explicit about infrastructure.** The main themes of IFAD's Strategic Framework 2011-15 were value chains, resilience and private sector, but it had no direct reference to the topic of infrastructure. The Strategic Framework 2007-2010 had a strong focus on CDD. It specifically mentioned social infrastructure that should be supplied, but only in response to community demands. There were also some relatively unspecific references to "financial infrastructure" and "infrastructure for market access." The Strategic Framework 2002-2006 was mainly concerned with achieving the Millennium Development Goals (MDGs) through, among others, the provision of basic rural infrastructure and partnerships, but again referred to these matters rather generally.

45. **Unclear strategic positioning in infrastructure collaboration and cofinancing.** The IFAD Strategic Framework 2016-2025 acknowledges the need to collaborate with others in large-scale rural infrastructure to achieve IFAD objectives and to combine public and private financing: "IFAD will partner with the public sector and other donors who will provide the bulk of investment, with IFAD focusing on complementary projects to ensure that smallholder farmers and other poor rural people are able to take advantage of the opportunities presented by these investments." However, while acknowledging the comparative advantage of others, IFAD does not have a comprehensive approach to these mainly sector- or infrastructure-type specific partnerships at corporate level; they are approached and realized on a project-by-project basis (see chapter IV on cofinancing) (IFAD, 2019e).

46. **Demand-driven approach.** IFAD's approach to infrastructure is demand-driven. The strongest drivers for infrastructure investments by IFAD are government and beneficiary demand. IFAD's long history of cooperation and institutional support for infrastructure users' associations and farmers' groups in client countries leads to direct demand by governments and beneficiaries for IFAD infrastructure investments (see box 3), particularly when cofinanciers are not available (see figure A3.2. on the e-survey).

Box 3
E-survey responses on IFAD's comparative advantage

Respondents to the e-survey for this evaluation synthesis report gave high marks for IFAD's community-based and small-scale infrastructure, somewhat lower ones for last-mile infrastructure (see figure A3.3.). According to the e-survey, IFAD has carved out a clear niche for water for agriculture infrastructure investments as compared to roads and market access, whose performance is seen less favourably. Natural resources management (NRM) and social infrastructure also have weaker scores.

In most areas, **e-survey respondents from governments, IFAD staff and consultants** see IFAD's niche and comparative advantage in relatively similar terms. Some differences were found in the importance of NRM infrastructure, which was scored higher by IFAD staff than by government officials (see figures A3.5.a and A3.5.b). Government has also high "don't know" responses for NRM (> 30 per cent). Second, last-mile infrastructure receives **fewer** strong scores from government and consultants (35-40 per cent) than from IFAD staff (67 per cent). This could be related to the unfamiliarity with the term "last-mile infrastructure" among these groups.

As far as **regional differences** are concerned, the community-based infrastructure is particularly appreciated in Asia and the Pacific (APR), and least in Near East, North Africa and Europe (NEN) (see figure A3.6.). Water infrastructure investments are more strongly scored in East and Southern Africa (ESA), NEN and APR than in Latin America and the Caribbean (LAC) and West and Central Africa (WCA); the differences for small-scale infrastructure are very similar in all regions, with scores in LAC and APR being slightly higher than in the others, and those in NEN being lowest.

Source: ESR e-survey.

47. **Country strategic opportunities programmes on infrastructure.** Country strategic opportunities programmes (COSOPs) are expected to provide the strategic link between corporate-level priorities and country-level demands and opportunities. However, they often do not lead to greater clarity on how IFAD would approach infrastructure within a specific country context. The review of CSPEs for the Top Ten infrastructure countries showed that only three COSOPs specifically had infrastructure among their objectives or strategic threads (Bangladesh, Cambodia and Egypt). Recent COSOPs have higher-level strategic objectives (e.g. market access) and do not specifically refer to infrastructure. The CSPEs often noted government preference for (hard) infrastructure investments, for example, for Cambodia, Egypt and Uganda. In other cases, there were emergencies driving the demand for infrastructure (e.g. the tsunami in Sri Lanka) or the need for basic infrastructure construction or rehabilitation in fragile and post-conflict situations (e.g. Afghanistan, Democratic Republic of the Congo, Niger, Sri Lanka and Uganda) (see chapter VI on countries with fragile situations).

48. **Cofinancing partnerships and opportunities** are important drivers of IFAD's investments in infrastructure, where available. The IFAD Strategic Framework 2016-2025 regards cofinancing for infrastructure as a critical way to leverage IFAD funds and to build on IFAD's comparative advantage in the provision of agricultural services and social and community development. Cofinancing partnerships are important to reduce the large rural infrastructure finance-gap on rural medium- and large-scale infrastructure and to link IFAD infrastructure with broader infrastructure systems. Cofinanced infrastructure investments would also support IFAD's partnership outcome objectives of: (i) country impact at scale; (ii) influencing agendas for equitable and sustainable rural development; and (iii) support of organizations representing IFAD's target groups (IFAD Partnership Framework 2019). Participants in the FGDs saw clear complementarities of IFAD technical agricultural and rural expertise on the ground and IFI strength in country management through their experts in country offices. This ESR provides more information on cofinancing scope, trends and performance in chapter IV.B.

IFAD's comparative advantage and strategic focus

49. **Types of infrastructure financed by IFAD.** IFAD sees its comparative advantage in small-scale, last-mile and community-driven infrastructure. Very few of the 35 ESR sample projects had infrastructure that could be regarded as large-scale under the definition of the IFAD infrastructure unit. Another exception is IFAD's large-scale irrigation infrastructure investment in Sri Lanka (#48) that was not cofinanced. On the second point, IFAD's infrastructure is indeed often the last mile, or first mile from a farmer's perspective, for larger networks, systems or countrywide basic infrastructure, such as tertiary rural roads or government-run schools and health centres.[8] In other cases, IFAD investments into infrastructure are more locally driven and determined, e.g. bottom-up through beneficiary and community demand for agricultural inputs, storage, processing and marketing; or for decentralized local networks and services for water, irrigation and energy.

50. **Water as an area of strategic focus.** As part of IFAD's commitment to the MDGs, the Eighth Replenishment of IFAD's Resources (IFAD8, 2010-2012) highlighted the need to address water scarcity (see box 4). The food price crisis of 2008-2009 drew attention to the need to develop, effectively manage and efficiently utilize water resources if agricultural production is to be increased. Pressures on renewable water resources for irrigation were expected to increase substantially, as at least 70 per cent of water in developing countries goes to agriculture, even if water-use efficiency has increased over time[9] (ESR Water). The need to see water availability and its development for agriculture and other purposes more broadly, particularly as a resource threatened by environmental problems and climate change, was re-emphasized in the Ninth Replenishment of IFAD's Resources (IFAD9). Groundwater depletion, salinization of irrigation and effects of deforestation all impact directly on agricultural productivity and availability of drinking water.

Box 4
Eighth Replenishment of IFAD's Resources – re-affirming attention to water for agriculture

Under the Millennium Development Goals (MDGs), the MDG 1 targets, including those of food security and nutrition, required structural and market failures to be addressed, which included inequality and access to control of land and water and underinvestment in smallholder agriculture. Documentation for the Eighth Replenishment of IFAD's Resources recognized that water was becoming increasingly scarce because of unsustainable rates of groundwater extraction and heightened competition from other users, and observed that, "globally, the amount of water available for agriculture may have already peaked." It also emphasized the need for natural resources protection, not only from the perspective of environmental services provisioning, but also in order to enable communities, especially the poor to adapt to climate change. It recognized that climate change would affect water availability due to increased variability in precipitation and rainfall and increased temperatures, thus leading to more frequent and intense droughts, floods, and reduced availability of water for irrigation. In turn, this would affect the predictability of food production in all countries.

Source: ESR Water Conservation and Management (2014).

51. **Natural resources management, climate change adaptation, and infrastructure.** Environmental protection, NRM and CCA – and to a lesser extent mitigation (energy) – have many infrastructure implications for agriculture and rural development, with potential additional benefits for preventive disaster risk reduction. The most recent IFAD strategy and action plan on climate change and environment

[8] However, IFAD has, remained committed to filling this "last-mile gap" especially for smallholder farmers in developing countries (see for example: IFAD Vision [2020]; IFAD Targeting Policy [2018]; IFAD10 Programme of Work [2014]; and IFAD Comprehensive Review of IFAD Rural Roads, Travel and Transport Experiences [2008]).
[9] The urgency of the situation was highlighted at the L'Aquila Summit which declared that: "many developing countries, particularly in Africa and Asia-Pacific, are still far from achieving sustainable access to water and sanitation and integrated water resource management, indispensable for sustainable development" and committed to support the G8 Evian Water Action Plan and the Global Agriculture and Food Security Programme by pledging US$20 billion over three years for this purpose.

(IFAD, 2018c) suggests: "Climate change as an environmental phenomenon is interrelated with a host of other environmental processes, [to be] addressed in an integrated manner" (IFAD Environment and Climate Change Strategy and Action Plan 2019-2025). The ultimate goal is climate resilience of beneficiary populations, which in turn will be supported among others through resilient infrastructure, natural resources and biodiversity (long-term resource sustainability).

52. The Environment and Natural Resources Management Policy (IFAD, 2012) summarized the best environment and natural resources management (ENRM) practices for infrastructure in terms of: (i) generating synergies between rural infrastructure construction and sustainable NRM, and context-specific and climate-resilient technologies; (ii) ensuring that all new infrastructure investments are climate-smart; (iii) social and environmental mitigation measures; and (iv) community-driven approaches and local employment, especially the creation of green jobs.[10]

53. Environment and climate change, and to a lesser extent NRM, are classical cross-cutting issues that affect all infrastructure categories. At the same time, infrastructure for NRM is a separate infrastructure category to capture various forms of (semi-)permanent land(scape) infrastructure: such as terraces, bunds and other erosion control, water reservoirs and ponds, and rainwater harvesting, often combined with climate-resilient agricultural technologies for better soil and water management (for more examples, see table A4.3.).

Environment and social safeguards

54. **The evolution of safeguards at IFAD.** IFAD adopted environmental and social safeguards some time ago, but their application has been less stringent than in other IFIs. In 2009, comprehensive environment and social assessment procedures replaced IFAD's former "administrative procedures on environment in the project cycle" and brought in new elements, such as resettlement and social issues. By all accounts, the new procedures were not rigidly implemented. Environment and social management plans were often not prepared, implemented and monitored, partly owing to the application of the own procedures of cooperating institutions in supervision (such as the United Nations Office for Project Services [UNOPS] and IFIs) before IFAD took on direct supervision. Another reason was that the type of small-scale infrastructure commonly implemented by IFAD was internally considered to have few risks that would trigger safeguards.

55. A new generation of SECAP was introduced at IFAD in 2015. In its first version, SECAP paid more attention to climate change risks and mainstreaming environment and social issues ("do good") in addition to classical safeguards ("do no harm"). SECAP was revised in 2017 when, for the first time, thresholds for risk categorization were introduced. The newer version also distinguished more clearly between "do no harm," or risk assessments, and "do good," or mainstreaming of environmental, climate and social issues. SECAP is most important for infrastructure projects, but also touches on non-infrastructure project activities through social and labour questions, grievance procedures, and climate change. Where infrastructure investments and subprojects are not clear at design – as their specific form or location would only be decided during implementation – IFAD requires that an environment and social management framework be developed, as an umbrella to guide the application of safeguards in subprojects.

56. Another SECAP draft version was developed for information for the Board in late 2020, updating the 2017 version. SECAP 2020 moves from guidelines to standards. It requests: advanced screening of these environmental, social and climate standards; coverage of emerging and social risks; mainstreaming themes; and more balance between application of safeguards during project design and execution. It

[10] There is no specific reference to infrastructure in the IFAD Strategy and Action Plan on Environment and Climate Change (2018), similar to the one in the IFAD Environment and Natural Resources Management Policy (2012).

also strives to enhance stakeholder engagement and grievance redress mechanisms. The new system has four instead of three risk categories, and revised thresholds for categorization. Moreover, SECAP 2020 mainstreams SECAP standards along with the implementation of the procurement process,[11] to mitigate associated risks and provide projects with the tools to effectively manage, monitor and enforce compliance with all SECAP standards. This approach is aligned to international standards among IFIs.

57. **Institutionalizing safeguards/SECAP in IFAD and in countries.** SECAP responsibilities are spread across three IFAD departments/units, which leads to inefficiencies and potential conflict of interest (particularly for staff in the Evaluation Cooperation Group [ECG]). Financial and human resources for conducting safeguard assessments and monitoring enforcement are scarce. The SECAP **compliance** ("do no harm") and the **mainstreaming** ("do good") parts at IFAD are institutionally split between ECG and the Operational Policy and Results Division (OPR). Safeguards are to be dealt with by ECG, in addition to their other tasks of designing and managing CCA projects. IFAD capacity is particularly low to deal with applying SECAP in subprojects that are developed not at design, but during implementation. Reasons include low awareness about SECAP among IFAD staff and the lack of tracking (monitoring) systems for actual or potential safeguards.

58. IFAD support for governments and cooperating ministries, and early engagement to enhance their safeguard/SECAP planning and supervision capacities are currently minimal. The capacities for SECAP planning and enforcement differ by country. Government follow-through with SECAP is seen as instrumental by IFAD safeguard experts. Experiences from other evaluations (e.g. AfDB, 2019) have shown limited results from efforts to build national safeguard capacities in general; scarce resources would be better spent on project-specific safeguards activities such as implementation follow-up.

59. **Application of safeguards.** Safeguards were not systematically and effectively pursued in IFAD-supported projects before 2015, as capacities were low and IFAD infrastructure was regarded as commonly below the size to have significant negative environmental and social effects. This ESR found only scarce references to safeguards in evaluation, project and supervision documents prior to 2015, when the new SECAP was introduced. Since 2015, safeguards have been included more systematically in project cycle formats and reports. Handling SECAP in cofinanced projects can be challenging, particularly with cofinanciers with less-demanding safeguards requirements (such as the OPEC Fund for International Development [OFID]). When safeguards differ by cofinancier, cofinanced projects customarily try to apply the most stringent safeguards,[12] or, if possible, safeguards could differ by project component where no agreement can be reached among cofinanciers on common safeguards standards. As stressed by staff consulted for this ESR, the implementation of SECAP in cofinanced infrastructure projects can be difficult, for instance, in Malawi where IFAD is partnering with the AfDB in an irrigation scheme (see also chapter IV.B and box 17).

60. A recent OPR portfolio review of 24 projects with high risk in terms of SECAP found several cases where: risks were not well defined, as ESIAs/studies were still missing; there was insufficient time for SECAP studies before Board approval; there were major gaps between national legislation and SECAP that affected how safeguard risks were addressed; and large infrastructure projects done by cofinanciers paid

[11] This has implications for the design, tendering and supervisions of IFAD-supported projects – especially those with an infrastructure component. The upcoming Standard Bidding Documents require compliance with the nine SECAP standards. Through these documents, IFAD will ensure that the contractor/supplier is responsible to the borrowers/recipients for managing environmental and social risks arising from infrastructure works and for delivering the expected outcomes. The borrowers/recipients will require that all contractors engaged in the project operate in a manner consistent with SECAP in their respective contracts.

[12] Of the closed projects classified as category A, 13 were supervised by IFAD and 16 by cofinanciers.

insufficient attention to IFAD specific safeguards. Altogether, the OPR review rated 8 (or one third) of 24 projects as still having substantial risks. For seven projects, no data were submitted.

61. IFAD's attention to the rights of smallholder farmers, such as on land and water security, and its focus on the poorest and indigenous peoples should actually suggest conducting more formal SECAP assessments for a larger proportion of its projects.[13] This would particularly apply for the impact of infrastructure on land ownership, distribution and resettlement, and compensation mechanisms, or the distribution of benefits in out-grower schemes. Land compensation cannot be left with communities, as one staff observed. Rather, it needs to be regulated and enforced by national governments, possibly mediated by local governments where they are available and mandated.

Towards better integration of climate change goals and risks

62. **Emerging priorities for future IFAD infrastructure.** An ongoing IFAD-financed Overseas Development Institute study in the Strategy and Knowledge Department of IFAD identified strong demand for rural investments in three areas: infrastructure; value chains; and climate-smart agriculture. The latter includes microgrid investments, bioenergy and other green energy. The study also suggested engaging more strongly with national rural development strategies at country level in all these areas. Participants in ESR focus groups perceived an increasing demand for innovative and climate-smart infrastructure, such as for climate-smart submersible, concrete-reinforced roads, a larger variety of technical irrigation models to enhance water-use efficiency in climate crises, renewable energy, and more applications of digital infrastructure solutions (see also box 5). These might be considered for future knowledge products.

Box 5
Summary of open-ended responses to the e-survey on climate action for this evaluation synthesis report

E-survey responses. For a large number of respondents to the e-survey the strengthening of climate resilience of infrastructure starts with building on SECAP, but requires to follow-through and enforce SECAP more effectively and update safeguards where necessary. 65 out of 150 open-ended responses on this issue saw the priority in better institutionalizing climate resilience in IFAD design and risk mitigation, building in climate-smart practices and including climate scenarios in design. For these respondents, design is where climate action needs to happen. They request better technical advice, and innovative and best practices at all stages. Continued research during implementation and flexible design could ensure that projects are more organic and adjustable to changing situations on the ground.

Building IFAD basic capacities on climate change was less considered to be an issue than the operationalization and clarification of basic concepts for project designers and to put these into practice. This includes, for instance, developing plain language guidelines.

Another set of comments called for better incentives within IFAD and more awareness raising in partner countries to increase demand for climate-resilient infrastructure and develop long-term national and local resilience plans.

A last concern by respondents was to ensure that potentially higher incremental costs for climate-smart solutions are covered and that they are not deterrent climate action. 13 respondents suggested to attract more climate finance and grants for this purpose, as well as for experimental purposes, and to seek out sympathetic and knowledgeable technical and implementation partners (climate finance and technical agencies such as the Global Environmental Facility (GEF), the Green Climate Fund and the Climate Investment Fund, FAO and certain civil society organizations). It was also suggested by respondents to spread the money not too thinly and allocate specific contingency funds in each project to ensure fast climate change action, repair damages and ensure post-project funds.

For 40 out of 150 responses activities related to country awareness and capacity building among government, beneficiaries and other stakeholders were most important for better

[13] This was debated in a focus group discussion (FGD).

climate action. This would include location specific infrastructure designs that are manageable and getting buy-in from all users, taking into consideration the capacities of implementing agencies. It would mean above all being mindful of the local context, participatory approaches and drawing on indigenous knowledge through documentation and awareness raising for good practices and consultations with all partners.

Several respondents also suggested to build on existing national policies for climate proofing and adaptation of infrastructure and involving or coordinating with the necessary ministries and agencies primarily mandated for climate change

Source: ESR e-survey.

63. **SECAP** is widely seen as an excellent policy and basis for ensuring environmental safeguards in IFAD-supported projects and protecting infrastructure against climate change risks. The 2018 Climate Change Strategy describes SECAP as "state-of-the art" for identifying climate and other risks. For all projects with a "moderate" climate risk classification, a basic climate risk analysis must be conducted during the project design stage and included in the SECAP review note. Adaptation and mitigation measures must be mainstreamed into the project design and project design report. For all projects with "high" climate risk classification, an in-depth climate risk analysis must be conducted during project design and adaptation, and risk-mitigation measures must be mainstreamed into the project design and project design report. How to apply SECAP for infrastructure has been spelled out in the "How to do" toolkit for climate-resilient rural infrastructure.

64. **Climate action plan.** Many of these suggestions are fully in line with the priority actions planned by the 2018 Climate Change Strategy and the proposed refinement of SECAP in this strategy. According to the strategy, they would provide a comprehensive set of tools for: assessment and decision-making to address technical issues and needs, concerning environmental risks and trade-offs; identifying interventions with the greatest benefits; integrating green technology and green value chains; and cooperating with national systems and programme partners. There would be actions on capacity development, knowledge management, horizon-scanning, and resource mobilization. The extent to which this action plan has already been realized is beyond the scope of this ESR but is likely to be evaluated in the ongoing IOE corporate-level evaluation on smallholder farmers' CCA.

65. **Water-related infrastructure.** Drinking water has been an essential part of IFAD-supported projects, and it remains in high demand. Against this background, it is hard to comprehend that IFAD's investments into drinking water have plunged to almost zero in recent replenishments. The need for clean water, often for human and livestock consumption, remains a top priority for women and very poor people in most communities. There is scope to improve the efficiency and sustainability of water-related interventions. Water management and irrigation would benefit from closer attention to natural resources and climate risks (climate-smart design) within landscape and watershed approaches. Stronger efforts should be made to apply more integrated and multiple water-use approaches, improve water-use efficiency, and incorporate climate resilience. This could lead to alternative, innovative and more sustainable types of productive water-use and irrigation systems, for crops and livestock.

B. IFAD portfolio on infrastructure (since 2001)

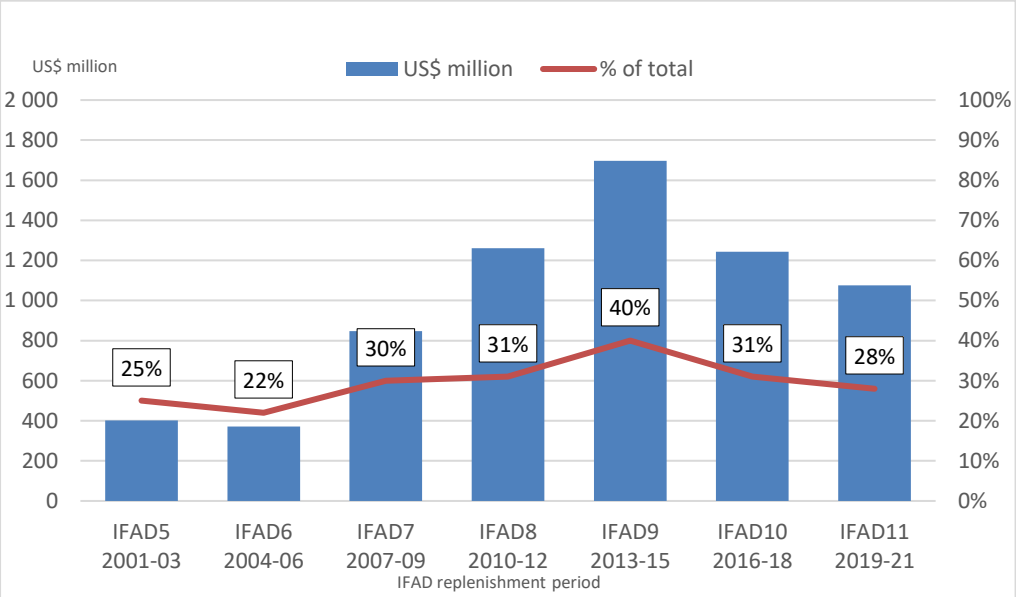
Infrastructure portfolio trends

66. **Overall investments.** The overall 30 per cent of IFAD's investments into projects since 2001 that have gone for infrastructure can be broken down into IFAD's own funds and those cofinanced by international partners.[14] From IFAD loans and grants

[14] The ESR defines infrastructure investments as the sum of IFAD and international cofinancing costs (Grants and Investment Projects System [GRIPS]). This includes all costs associated with 27 infrastructure-heavy subcategories (out of 68 subcategories in total) in the new PMI IFAD categorization matrix. Definitions for each subcategory were

alone, 25 per cent of investments were dedicated to infrastructure. They covered a total of 53 per cent of all internationally financed infrastructure costs in IFAD-supported projects, with international cofinanciers taking on 47 per cent of these costs.[15] IFAD's overall amount for infrastructure also masks some important regional differences. The highest amount of IFAD's infrastructure investments went to sub-Saharan Africa, with 44 per cent of all resources going to WCA and ESA (23 and 21 per cent, respectively), followed by APR (38 per cent), NEN (14 per cent), and trailed by LAC (4 per cent) (see figure A5.1.).

Figure 2
IFAD infrastructure investments by IFAD replenishment period since 2001



Source: GRIPS (2020).

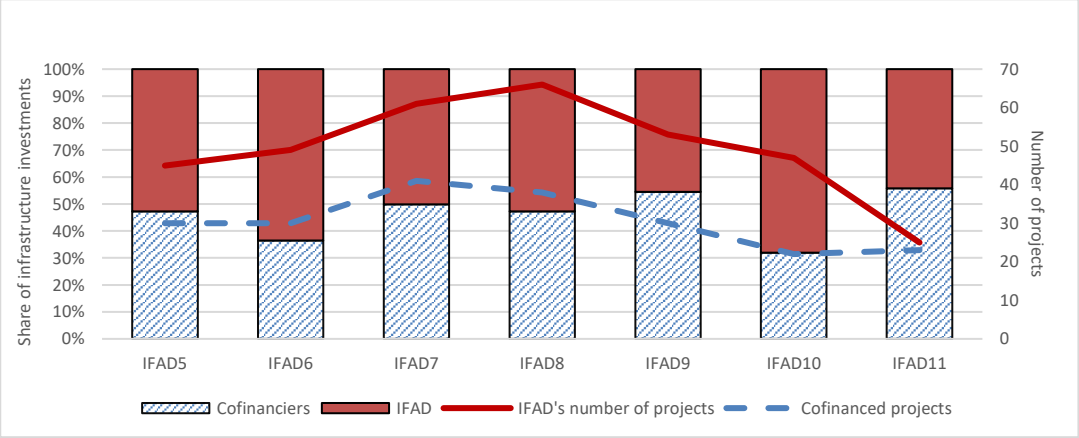
67. **Trends over time.** IFAD infrastructure investments increased significantly with IFAD7 (2007-2009) (see figure 2). This was partly the result of overall increases in IFAD budgets during the 2008-2009 food price crisis and Heavily Indebted Poor Countries Initiative (HIPC Initiative) debt relief in the mid-2000s (Debt Sustainability Framework). Still, the share of IFAD infrastructure costs moved from about 22-25 per cent in IFAD5-6 up to 30 per cent in IFAD7 and has since remained relatively stable, between 28 and 30 per cent. A spike IFAD9, including the infrastructure share, is fully explained by the outlier Indonesia Integrated Participatory Development and Management of the Irrigation Sector Project (US$600 million, including cofinancing).

68. **International cofinancing.** The share of cofinancing for infrastructure investments has been about 40 per cent. The number of cofinanced projects with infrastructure has gone down overtime, following a similar trend in the number of IFAD-supported projects (see figure 3). In IFAD11, 23 out of 25 newly approved projects with infrastructure to date were cofinanced.

used for the ESR to determine infrastructure-heavy subcomponents. This includes two subcategories that only refer to soft infrastructure, irrigation and drainage management, and asset-user group development.

[15] All cofinancing figures are planned, not necessarily actual, costs. Cost numbers are updated during the project cycle, as necessary. GRIPS or other IFAD statistics do not track actual infrastructure disbursements.

Figure 3
Cofinanced infrastructure investment shares and projects by IFAD replenishment period



Note: Only IFAD-supported projects with at least one infrastructure component are included.
Source: GRIPS (2020).

69. The ADB provides the highest share of international cofinancing for infrastructure**,** almost 22 per cent, followed by OFID at 18 per cent. IFIs (such as the World Bank, the regional banks and the Global Environment Facility [GEF]) cover 68 per cent, bilaterals and NGOs another 8 per cent, and other United Nations agencies 7 per cent. In Asia, cooperation with the ADB on infrastructure is perceived as far more advanced and performing better than that with IFIs in other regions.[16] In 2010, IFAD signed cooperation agreements (memorandums of understanding) with the ADB and AfDB. Since then, the total amount of ADB cofinancing for infrastructure has increased from US$101m for 2001-2009 to US$753m, out of which US$600 million came from the Indonesia Integrated Participatory Development and Management of the Irrigation Sector Project.

70. For the AfDB, infrastructure cofinancing went up to US$192m, from US$140m for the 2001-2009 period. AfDB cofinancing was concentrated in IFAD8 and IFAD11, with almost none for IFAD9-10. International financial institutions together provide 68 per cent of all cofinancing for infrastructure**,** with an increasing share since IFAD7 (see figure A5.2.). United Nations agencies are cofinanciers of another 7 per cent of infrastructure investments, and other international partners, such as bilaterals and NGOs, account for 8 per cent.

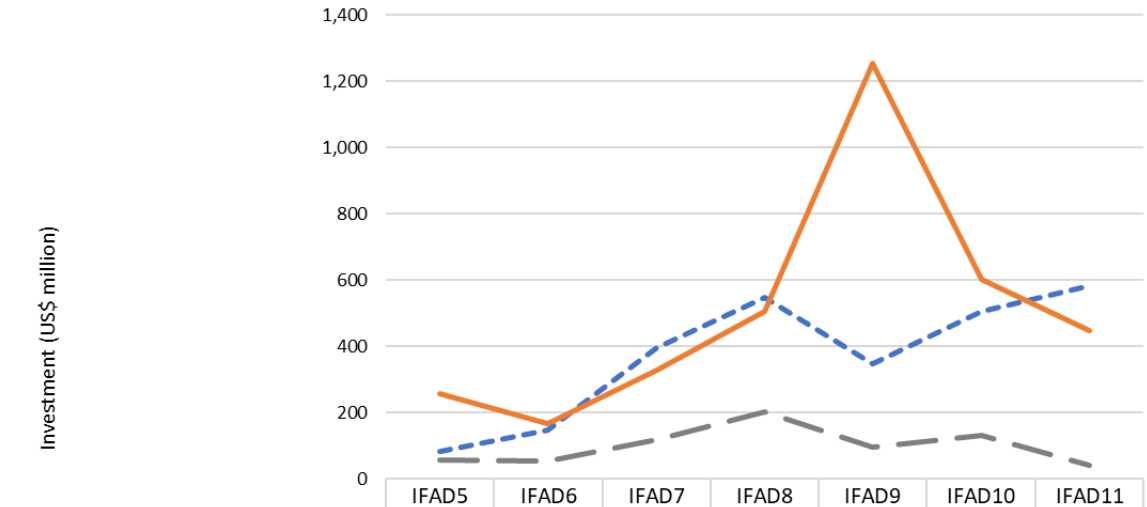
71. **Domestic cofinancing.** Governments contributed a total of 18 per cent[17] in domestic cofinancing for infrastructure between 2001 and 2020. The highest government cofinancing share is found in APR (22 per cent), followed by LAC and NEN (20 per cent each). It is lowest in WCA and ESA (16 and 11 per cent, respectively) (see figure A5.3.).

72. **Trends according to country types.** The total percentage of IFAD infrastructure investments over the period 2001-2020 is highest for the lower-middle-income countries (52 per cent), followed by LICs (38 per cent) and upper-middle-income countries (10 per cent) (see figure A5.4.). The share of infrastructure investments increased for LICs over time, most likely related to the increased finance volume for LICs after the 2008-2009 food price crisis and HIPC Debt Sustainability Framework, as noted for instance in Burundi and The Gambia (case studies). IFAD's infrastructure investments have also increased for the lower-middle-income countries, but not for the upper-middle-income countries (except for a small peak in IFAD8) (see figure 4).The spike in lower-middle-income countries in IFAD9 is almost fully explained by the Indonesia project (US$600m). Infrastructure categories are similar for different

[16] Source: Focus group discussion.
[17] Government costs are given as a share of the sum of infrastructure costs financed by IFAD and international cofinanciers.

country types, except for significantly higher social expenditures in upper-middle-income countries, and a higher percentage for NRM/CCA in LICs (see figure A5.5.).

Figure 4
Middle- and lower-income countries: infrastructure investments trends



	IFAD5	IFAD6	IFAD7	IFAD8	IFAD9	IFAD10	IFAD11
Low-income countries	84	149	398	549	347	507	585
Lower-middle-income countries	259	166	329	507	1254	603	448
Upper-middle-income	59	56	121	204	95	134	42
Grand Total	401	371	847	1260	1696	1243	1075

Source: PMI database (accessed April 2020).

73. **Countries with fragile situations** have received a relatively high infrastructure share of ENRM/CCA investments (16 per cent versus 8 per cent for other countries), and a much lower share of market access infrastructure (see figure A5.6.). This indicates that NRM/CCA infrastructure may be a way to support basic infrastructure investments at farm level in these countries, partly also with the help of food or cash for work (see chapter IV on countries with fragile situations and NRM/CCA).

Infrastructure categories

74. **Typology for infrastructure at IFAD.** The newly released IFAD corporate project categorization by the Sustainable Production, Markets and Institutions Division (PMI) (July 2020) aggregated 12 out of 68 thematic subcategories at IFAD as rural infrastructure in the corporate dashboard There is broad agreement on the main categories and subcategories of production and market infrastructure. There is less agreement on social infrastructure and infrastructure concerned with NRM and CCA (also sometimes referred to as "green infrastructure;" see table A4.6.). For its review of infrastructure trends, this ESR uses the broad categories of production, market access, social and NRM/CCA.[18] In addition, specific infrastructure activities, for example, irrigation, roads and drinking water, are discussed in various parts of the report.

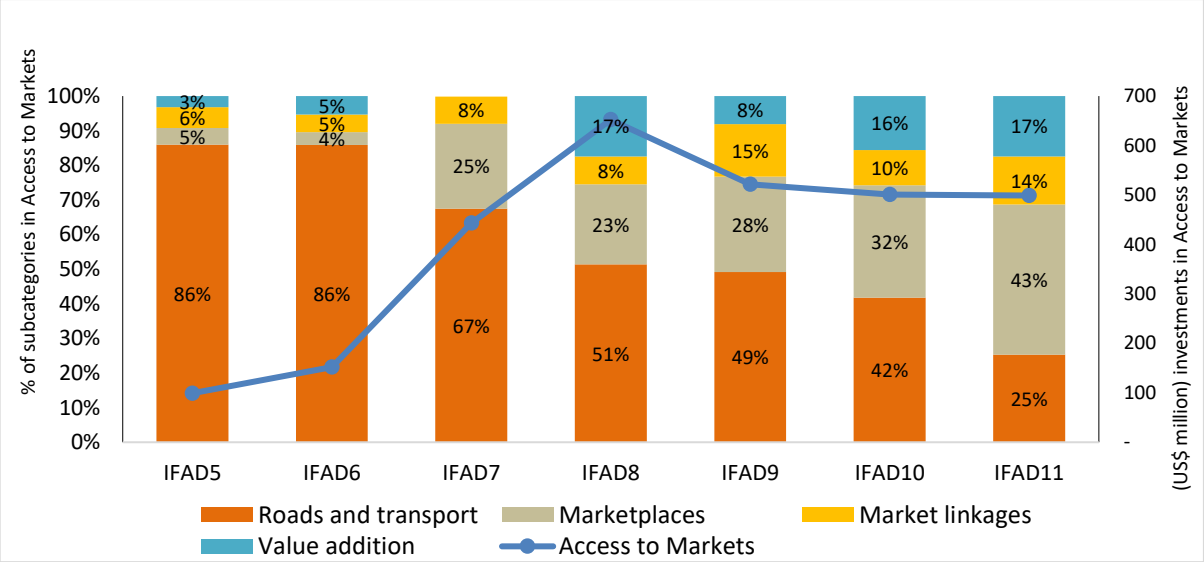
75. **Investments by infrastructure category.** Of all infrastructure investments, 42 per cent went into production and 42 per cent to market access infrastructure. About 10 per cent were allocated to NRM/CCA infrastructure and 5 per cent to social services. There was a noticeable increase in ENRM/CCA and decrease in social sector investments over time (see figure A5.7.). Social sector infrastructure investments are probably underestimated, but the extent is not clear. The reason is that they were often included in the previous "catch-all" IFAD category of "rural

[18] The soft infrastructure categories of irrigation management and development of asset user groups are also included in the following analysis of infrastructure development at IFAD.

infrastructure," and subsumed in subcategories other than "social" in the latest PMI categorization.

76. Between IFAD5 and IFAD11, overall IFAD infrastructure investments in market infrastructure more than tripled (see blue line in figure 5). The share of market access infrastructure funds going to roads and transport declined from 86 per cent in the early years to about 50 per cent in IFAD8-10, and even less in IFAD11, to date (25 per cent). Marketplaces and market linkages (representing the hard and soft components) have become the investment area of choice, covering more than 57 per cent of all market access infrastructure in IFAD11. Value addition has also increased, particularly since IFAD8 (2010) or even IFAD7.

Figure 5
Market access over time: investments by infrastructure subcategory by replenishment period since 2001

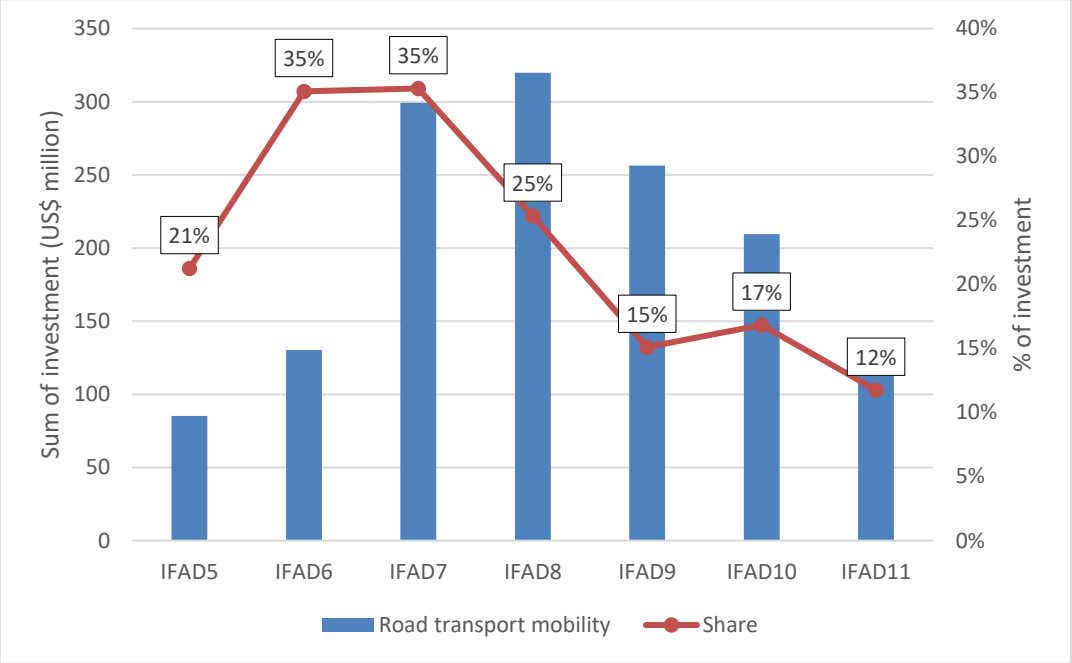


Source: PMI database (accessed April 2020).

77. ESA and WCA had a much higher share of market-related infrastructure than the other regions (see figure A5.8.). APR and NEN focused more on production-related infrastructure, and LAC had a relatively high share of ENRM/CCA infrastructure (but at a rather low absolute level).

78. **Main infrastructure investments.** Roads and irrigation were the main infrastructure investment subcategories for the review period (see figure 6). Total IFAD investments from IFAD5 to IFAD11 were US$1,427m for roads and US$1,417m for irrigation, including cofinancing. Roads constituted the largest share of infrastructure investments from 2006 to 2012 (IFAD6, IFAD7 and IFAD8), between one quarter and one third, but they declined to a low of 12 per cent in IFAD11.

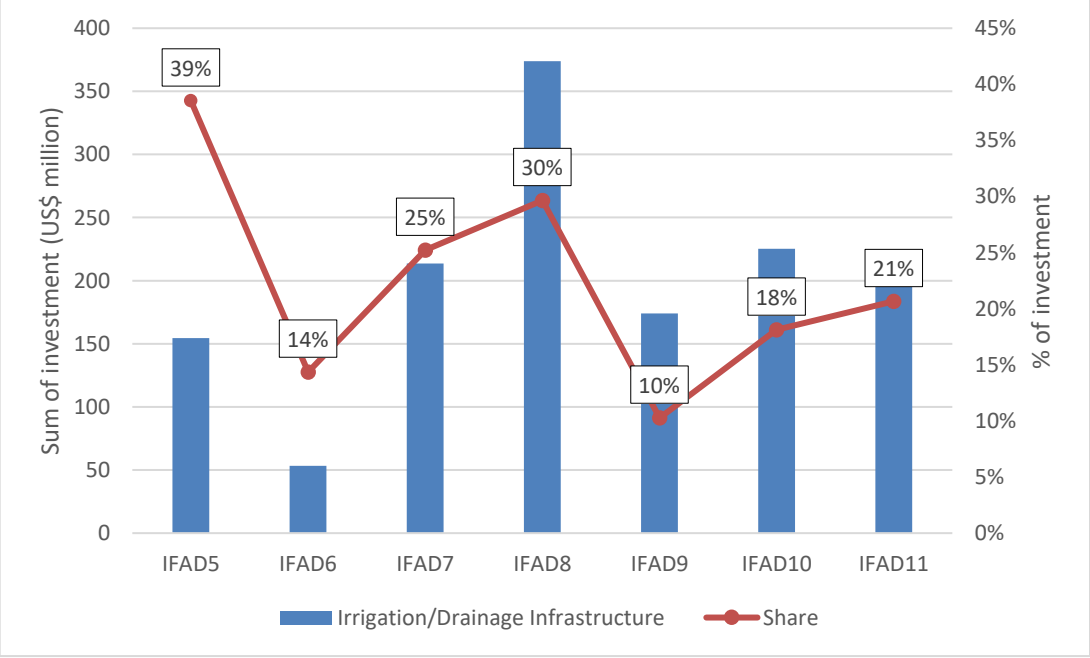
Figure 6
Investment in road transport by replenishment period



Source: PMI database (accessed April 2020).

79. Investments into irrigation (not including irrigation management) have been fluctuating over time (see figure 7), from a low of 14 per cent in IFAD6 to a more recent high of 30 per cent in IFAD8 in the wake of the 2008-2009 food price crisis (apart from the earlier high of 39 per cent in IFAD5, but with much lower total investment costs). They stood at 21 per cent of all investments into infrastructure in IFAD11.

Figure 7
Investment in irrigation and drainage infrastructure by replenishment period

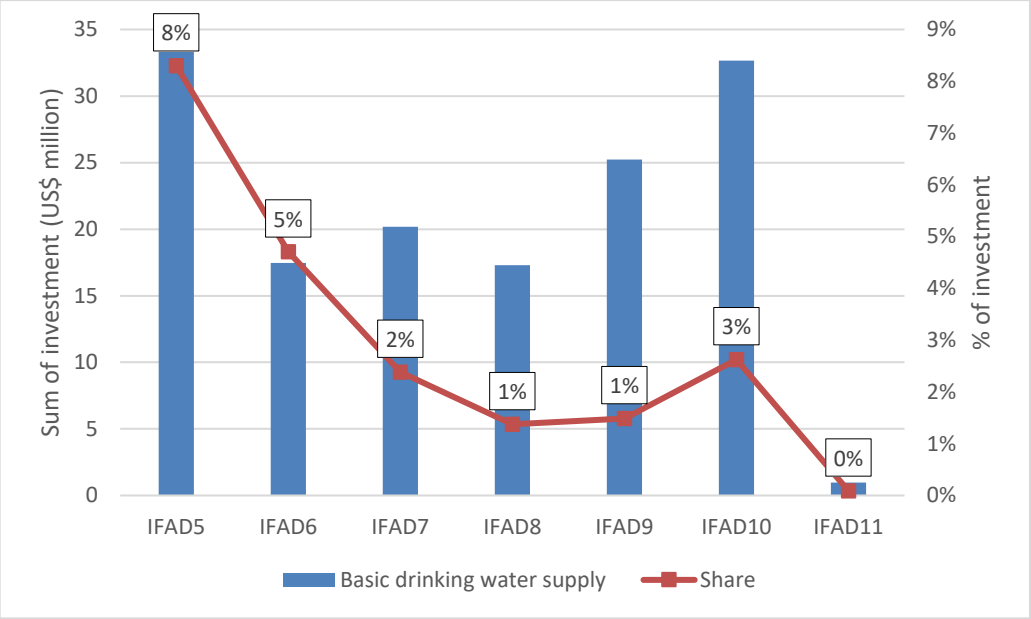


Source: PMI database (accessed April 2020).

80. On the other hand, the share of investments going into drinking water, once a staple ingredient in IFAD's community projects, came down from 8 per cent in IFAD5 to 3

per cent in IFAD10 (see figure 8). Investments into drinking water have been less than US$1 million in IFAD11 (halfway through the replenishment period).

Figure 8
Investment in drinking water by replenishment period



Source: PMI database (accessed April 2020).

C. Corporate capacities, knowledge, and monitoring and evaluation

Corporate technical support capacities

81. IFAD in-house capacities for technical support of infrastructure planning and implementation support and supervision are low. There is currently only a small unit of two technical staff at IFAD headquarters ("water and rural infrastructure desk") who provide cross-cutting infrastructure support services and guidance. The number of staff seems low, given the need to coordinate knowledge management and follow-up on the safeguards and design for infrastructure-heavy projects (category A projects). The staffing situation has not changed significantly over the last two decades.[19]

82. This technical unit is supposed to give technical support for interventions that make up between 20 and 30 per cent of the IFAD portfolio, the majority recently being Track 1 projects (relatively high volume and potential SECAP category A projects). This includes project design and implementation support missions, of which the unit carries out about 8-10 annually. For other projects, the support may involve identification of suitable infrastructure experts. The demand for such support comes from CPMs.[20]

83. The tasks of the infrastructure desk also include the development and implementation of technical grants on infrastructure topics, the production of knowledge and learning products, responses to corporate requests, and partnerships with external organizations. IFAD's participation in external networks reflects its focus on water for agriculture. IFAD is a member of UN-Water, where members of

[19] Efforts to recruit a technical expert for a vacancy for rural infrastructure and renewable energy expert are currently under way.
[20] From ESA, APR, NEN and WCA, in order of frequency.

the infrastructure desk join in knowledge-sharing and coordination.[21] IFAD is also a member of several other water-related groups and task forces, for example, the Global Framework on Water Scarcity in Agriculture.

84. As at headquarters, there are only few IFAD in-house capacities to support infrastructure investments in the regions. There are no technical expert positions among the decentralized regional staff. The regional decentralization was a missed opportunity to establish regional positions for infrastructure experts as had been requested for Africa and for NEN (the latter was a request for a water infrastructure specialist). Moreover, there is no professional network of infrastructure experts or staff with extensive infrastructure experience, similar, for instance, to the IFAD economists' network.

Knowledge products, guidance and studies

85. Over the years, IFAD has developed a number of knowledge products on infrastructure for project design and implementation (see table 5). The topics have responded to the strategic needs and priorities at a given time. The selection is not comprehensive and several of the notes are only available in a draft form. The strategic guidance and knowledge products have not systematically updated and disseminated across the organization.

86. **Knowledge products and guidance.** The knowledge products prepared in 2007 and 2008 reflect IFADs focus on water and roads (see above) and pro-poor targeting. While water has remained a priority for knowledge management, value chains and climate-resilient infrastructure have become a new area of focus more recently. For commodity value chains this includes a comprehensive toolkit with regular references to production and market access infrastructure, including the role of private sector and public-private-producer partnerships (4Ps). PMI also came up with a more recent "How to do" summary guidebook on rural infrastructure investments (2018a). A toolkit on irrigation is available as a draft (2020).

Table 5
Guidance and learning notes on infrastructure

Title	*Year*
Agricultural Water Infrastructure and Management (3.2)	2007
Food Security and Productive Sanitation Systems (7.3)	2007
Rural Water Supply (7.4)	2007
Institutional, Partnership and Empowerment Dimensions of Pro-Poor Rural Infrastructure Investments (7.5)	2007
Local Participation in Pro-Poor Rural Infrastructure Investment Projects (7.6)	2007
Procurement of Goods and Services for Pro-Poor Rural Infrastructure Projects (7.7)	2007
Pro-Poor Irrigation Water Charging and Cost Recovery (7.8)	2007
Learning Notes Series (All)	2008
IFAD-ILO-IFRTD Workshop on Rural Roads, Transportation and Travel – RTT	2008
Commodity Value Chain Development Projects	2014
Public-Private-Producer Partnerships (4Ps) in Agricultural Value Chains	2016
Climate Resilient Rural Infrastructure Toolkit: Rural Infrastructure Investments	2018
Water and Rural Infrastructure: Design and Implementation of IFAD-assisted Irrigation Investment Projects	2019

Source: ESR compilation.

[21] UN-Water is the United Nations inter-agency coordination mechanism for all freshwater-related matters, including sanitation. UN-Water was formalized in 2003 by the United Nations System Chief Executives Board for Coordination. It provides the platform to address the cross-cutting nature of water and maximize system-wide coordinated action and coherence.

87. **Thematic studies.** Some infrastructure categories have been well covered by studies, such as the comprehensive study on rural roads in 2008 (see table 6). Again, water and roads were areas of focus in the earlier part of the review period. Studies on climate resilience and value chains, the latter with a focus on soft infrastructure aspects, are more recent. Overall, given the size of the investments, systematic studies of infrastructure-related themes remain scares.

Table 6
Thematic studies on infrastructure

Title	*Year*
Gender and Water – Securing Water for Improved Rural Livelihoods: The Multiple-Uses System Approach	2006
Comprehensive Review of IFAD Rural Roads, Travel and Transport (RTT) Experiences, 1994-2007	2008
Assignment Report – Implementation Support for IDPPE, Mozambique; Establishing a Mechanism for Social Development	2010
Delivering Public, Private and Semi-Private Goods	2015
Fostering Inclusive and Sustainable Agricultural Value Chains: The Role of Climate-Resilient Infrastructure for Small and Medium-Sized Enterprises	2019
A New Categorization Framework for IFAD-Supported Project Interventions	2019

Source: ESR compilation.

88. Several IFAD publications lay out the set of relevant activities and concerns for climate-smart investments and infrastructure, such as the 2012 Occasional Paper no. 3 *Climate-smart smallholder agriculture: What's different?*, and the 2019 Adaptation for Smallholder Agriculture Programme / Building Resilience and Adaptation to Climate Extremes and Disasters report on climate-smart infrastructure for value chain small and medium-sized enterprises (SMEs). The latter puts emphasizes, among others, on the consideration of local context, equitable access, buy-in of all stakeholders, capacity-building, and consistency with countries national and local priorities.

Monitoring and evaluation of infrastructure-related operations

89. **Corporate data systems.** Identifying infrastructure in IFAD data systems and documents is not straightforward. This is because either the categories are not clearly defined or the investments are not clearly categorized as infrastructure, as mentioned above. Many IFAD infrastructure subprojects are only designed and developed during implementation without being properly recorded in corporate data systems. This makes M&E and safeguards follow-up at corporate level difficult. Tracking of infrastructure is particularly hard for cofinanced projects with parallel implementation that is not regularly updated in IFAD supervision and corporate systems throughout the project cycle. There is no information whether infrastructure investments are mainly focused on rehabilitation or construction of new infrastructure.

90. **At project and country level,** there are few project design and monitoring systems in place to: (i) identify and monitor necessary planning and supervision requirements over the project cycle for infrastructure technical feasibility and safeguards; (ii) adequately phase, implement and monitor soft and hard infrastructure activities; and (iii) track and assess infrastructure investments from a comprehensive technical and social point of view, not only for quantitative targets achieved, but also their technical quality (according to common standards), country locations (GPS), infrastructure utilization, O&M, and access for IFAD's key target groups.[22]

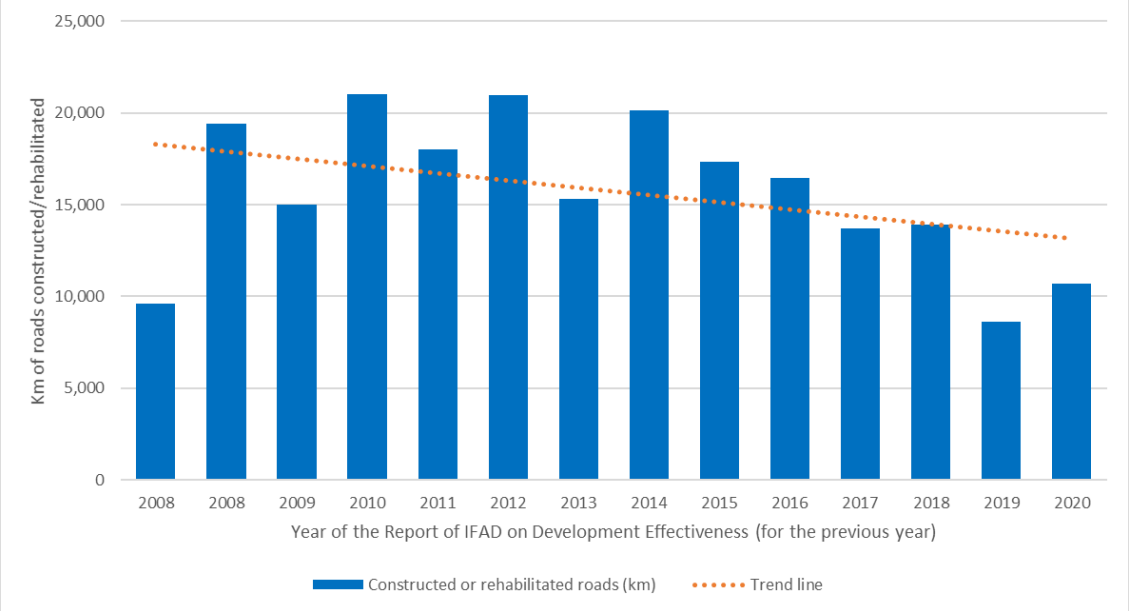
[22] This finding is mainly based on perceptions conveyed in ESR FGDs and from reviews of relevant project design and supervision reports, as well as the limited amount and variety of information provided by evaluations on several of the indicators mentioned in the text.

91. **The IFAD results management framework (RMF),** which was last updated in 2017, provides two key performance indicators for measuring IFAD's infrastructure results (tier 2): newly constructed and rehabilitated roads and irrigated land.[23] Progress on these indicators is reported in the replenishment documents and in the annual Report on IFAD's Development Effectiveness (RIDE) based on project supervisions and monitoring in countries.

92. The RIDEs show declining trends for both indicators (see figure 9).[24] For newly constructed or rehabilitated roads, the trend has been reversed in recent years. A decrease in road construction is fully explained and in line with the decreasing investments over time as reported above. For irrigated land, the strong gyrations of results are less plausible. Irrigation investments were more stable (and without a clear trend) over time and their strong increase in IFAD8 (2010-2012) should actually have borne fruit in about 2016 and 2017, the years for which the decline was most marked (down from about 300,000 ha in previous years to about 50,000 ha).

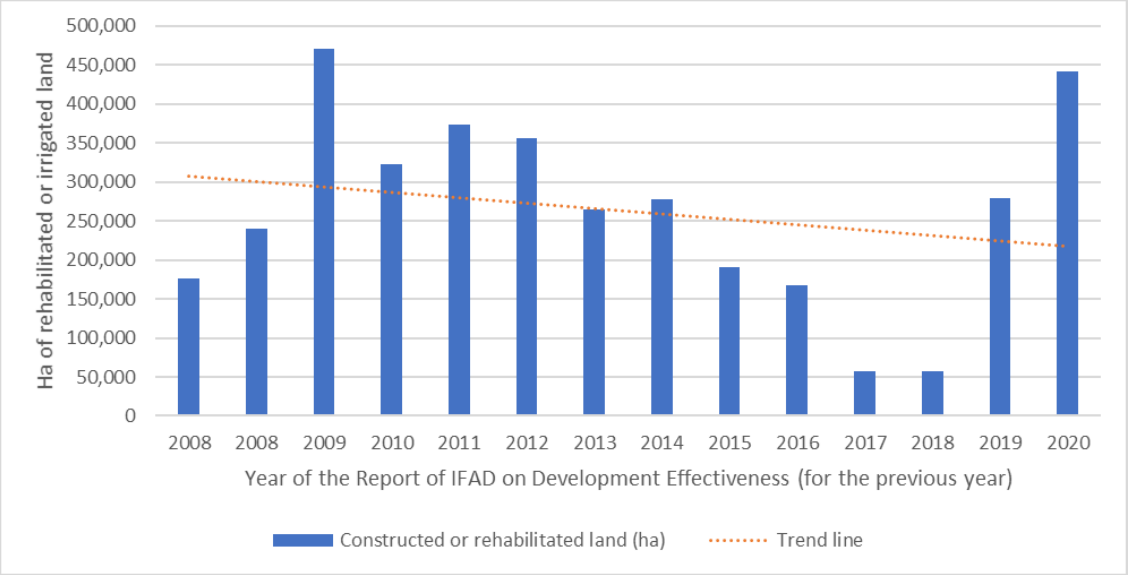
93. Figure 9 shows the updated graphs of the infrastructure indicators over time.

Figure 9a/9b
Constructed or rehabilitated roads and irrigated roads and land



Source: RIDEs 2008 – 2020.

[23] These are a subset of the 21 core indicators approved by the Executive Board in April 2016 in the context of the revision of the 2007 Results and Impact Measurement System (RIMS).
[24] The 2008 RIDE report has only one indicator for rehabilitated irrigated land. The 2009 RIDE report has two values: one from the respective infrastructure projects that actually reported (176,000 ha for irrigation and 9,500 km for roads), and one that extrapolates the numbers for those projects not reporting (based on relative project costs). This increased the total figures for the year to 240,000 ha for irrigation and 19,300 km for roads.



Source: RIDEs 2008 – 2020.

94. At the time of this review, the Operational Results Management System still had core indicators that were not well defined and broadly interpreted. Some projects use other indicators for irrigation and water management outputs; for other projects, the indicator includes area of watershed development, which is quite different from irrigated lands. The bottom-up approach from project logical-framework reporting introduces all types of noise in the formulation of variables, through missing values and errors in the aggregate database.[25] Last, the irrigation indicator sums up project activities that are very different: from new irrigation schemes through to rehabilitation of main canals in old ones to cleaning up of secondary and tertiary canals; and from relatively small vegetable gardens over fodder production to large cofinanced irrigation schemes. While some of this is unavoidable for key performance indicator reporting, their interpretation needs to be undertaken with caution, the more so as such output reporting does not give any indication as to what extent the schemes are actually functioning, being used by target groups, and providing incremental benefits and outcomes (assumptions that need to be questioned based on a closer analysis of outputs project-by-project in the ESR sample). There is also no reference to soft infrastructure indicators.

95. **Monitoring infrastructure outcome performance beyond outputs.** There are no indicators in the corporate IFAD RMF system for reporting on actual infrastructure performance, or its outcomes in terms of functionality and utilization, sustainability and the number of groups and people benefiting. How key RMF impact indicators of people with improved production and market access are related to improved infrastructure is not clear. The RMF indicators reported by the RIDEs measure outcomes in ratings for overall project achievements (PCRs and IOE) and certain broader indicators. The Results and Impact Management System (RIMS) offered several indicators that would be useful for the purpose of outcome reporting. However, they were never defined as core indicators and widely adopted and aggregated (IFAD, 2007). This includes, for instance: the likelihood of sustainability of infrastructure and the groups managing infrastructure (e.g. after three years of operation); group functionality; and water delivered and farmers with secure access. Focusing M&E on a few infrastructure categories and their physical outputs distracts from what IFAD considers its corporate strength, which is a variety of demand-led, small-scale infrastructure with a strong emphasis on soft infrastructure support.

[25] This was evident when the ERS attempted to reconstruct reported numbers over time, which turned out to be impossible.

96. **Impact of infrastructure.** RIA managed to shed light on IFAD infrastructure outcomes and impact, and to address part of the knowledge gap. RIA conducted a series of rigorous impact assessments in selected projects with strong infrastructure investments. These projects cover different infrastructure categories and regions (see table 7). In this commendable effort, RIA identified several beneficiary outcomes of these projects around IFAD's three SOs (production, market access and resilience) and identified a number of constraints and lessons for enhanced impact. The studies also discussed methodological issues and complications of impact assessment in a limited project context. There has been no systematic review (or synthesis) of these studies yet, which would be the next logical and valuable step.[26]

Table 7
RIA impact assessments of projects with significant infrastructure share

Title	*Year*
Impact Assessment of the Irrigated Rice Production Enhancement Project, Philippines	2018
Impact Assessment Report: Guangxi Integrated Agricultural Development Project, China	2018
Impact Assessment Report: Participatory Small Irrigation Development Programme I, Ethiopia	2018
Impact Assessment of the Cereal Banks Intervention in the Programme d'Appui au Développement Rural dans le Guéra, Chad	2018
Impact assessment report: Coastal Climate Resilience Infrastructure Project, People's Republic of Bangladesh	2019
Gente de Valor – Rural Communities Development Project in the Poorest Areas of the State of Bahia, Brazil	2019

Source*:* ESR compilation.

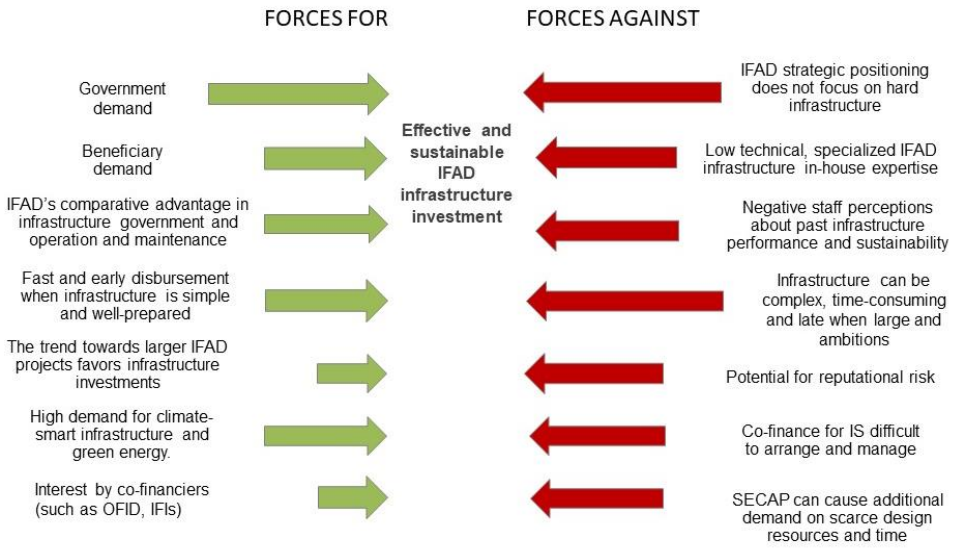
97. **In sum,** M&E of infrastructure at IFAD is, by and large and with the exception of the RIA studies, not looking in the right places. It mainly relies on counting some outputs, mostly on the hard infrastructure side, and mainly for corporate reporting purposes. There is little emphasis on monitoring the soft dimensions of infrastructure, which are hard to measure, such as ownership, capacities and governance.[27] Much M&E is done in a piecemeal way, with little value added for managing infrastructure-heavy projects and not suited to inform management on the value added and ultimate benefits of infrastructure and related investments. Management is not well informed on where and how to invest in infrastructure.

D. Driving forces for infrastructure investments

98. Based on above findings and observations from surveys and focus groups, the most important drivers for IFAD infrastructure investments and its major obstacles can be summarized as a field of forces for and against infrastructure, as follows (see figure 10).

[26] RIA impact assessments have informed the ESR case studies, where available. Findings are synthesised in chapter V of this report.
[27] RIMS initially included a number of related indicators.

Figure 10
Force field: positive and negative factors driving infrastructure investments at IFAD



Notes: OFID: OPEC Fund for International Development; IFIs: international financial institutions; SECAP: Social, Environmental and Climate Assessment Procedures.
Source: E-survey and FGDs.

99. Among the supportive forces, the strong demand by governments and beneficiaries for rural infrastructure is further reinforced through IFAD's long-term expertise and comparative advantage from working with infrastructure user groups, mainly in community infrastructure planning and O&M. Infrastructure is also perceived as disbursing fast when sufficiently and well prepared, and allows early project results in such cases to show. The tendency towards larger IFAD-supported projects favours infrastructure investments as their fund absorption capacity is high. Last, interest from cofinanciers in infrastructure cooperation and related positive co-benefits are another major positive driver, as is the current high demand for climate-smart infrastructure and green energy.

100. In contrast, several negative forces work against more infrastructure investments at IFAD. In particular, these are the relatively weak high-level strategic emphasis of infrastructure at IFAD, and its corporate and project-level technical support mechanisms and capacities. In-house incentives and capacities for planning, managing and supervising infrastructure are relatively low; and where they do exist, they are more tacit and embodied in staff rather than being explicit and with functional responsibilities. Perceptions on performance and sustainability of IFAD infrastructure in the past have been mixed, which limits the enthusiasm for the infrastructure instrument. As a result, the potential for reputational risks are considered as high, such as through poorly implemented schemes and neglect of safeguards. Safeguards can place additional demands on scarce design and time resources, particularly for more ambitious and demanding infrastructure projects. In general, the complexity and frequently delayed implementation of many infrastructure projects are a major potential negative force working against more infrastructure at IFAD. Moreover, despite the generally positive expected effects associated with cofinancing, cofinanced projects are often difficult to synchronize and implement, which can limit their potential usefulness for infrastructure (see chapter IV).

Key points (chapter II)

- Strategy. IFAD does not have an infrastructure policy or a dedicated infrastructure strategy. However, infrastructure is referred to as a key ingredient to achieve IFAD's SOs. IFAD acknowledges the need to collaborate with others in large-scale rural infrastructure to achieve IFAD objectives and to combine public and private financing.
- IFAD sees its comparative advantage in small-scale, last-mile and community-driven infrastructure. Survey respondents see IFAD as having a niche for water for agriculture infrastructure investments as compared to roads and market access, whose performance is seen less favourably.
- A key driver for infrastructure investments is demand from government partners and target groups. Cofinancing partnerships and opportunities are also driving investments into infrastructure, where they are available.
- Safeguards. Application of environmental and social safeguards has been less stringent than in other IFIs. Safeguards were not systematically and effectively pursued in IFAD-supported projects before 2015, as capacities were low. SECAP responsibilities are spread across three IFAD departments/units, which leads to inefficiencies and potential conflict of interest (particularly for ECG staff).
- IFAD's attention to the rights of smallholder farmers, such as regarding land and water security, and its focus on the poorest and indigenous peoples should actually suggest conducting more formal SECAP assessments for a larger proportion of its projects. In particular, this would apply for the impact of infrastructure on land ownership, distribution and resettlement, and compensation mechanisms, or the distribution of benefits in out-grower schemes.
- Portfolio. IFAD infrastructure investments increased significantly with IFAD7 (2007-2009), partly as a result of the overall increase in IFAD budgets during the 2009-2009 food price crisis and HIPC debt relief in the mid-2000s. The total percentage of IFAD infrastructure investments over the period 2001-2020 is highest for the lower-middle-income countries (52 per cent), followed by LICs (38 per cent) and upper-middle-income countries (10 per cent).
- The share of cofinancing for infrastructure investments has been about 40 per cent. The number of cofinanced projects with infrastructure has been reduced over time, following a similar trend in the number of IFAD-supported projects.
- Of all infrastructure investments, 42 per cent went into production and 42 per cent to market access infrastructure. Roads and irrigation were the main infrastructure investment categories for the review period. However, investments for drinking water declined from 8 per cent in IFAD5 to 3 per cent in IFAD10.
- Capacities and knowledge. IFAD in-house capacities for technical support of infrastructure planning and implementation support and supervision are low, on the technical, governance and safeguards sides of infrastructure. There are no technical expert positions among the decentralized regional staff.
- M&E. The corporate data systems for infrastructure M&E and follow-up are weak. Infrastructure subprojects are designed and developed during implementation without being properly recorded in corporate data systems. Information on cofinanced projects with parallel implementation is not regularly updated, and there is no information on rehabilitated or newly constructed infrastructure.
- There are no indicators in the corporate IFAD RMF system for reporting on actual infrastructure performance, or its outcomes in terms of functionality and utilization, sustainability and the number of groups and people benefiting. The RIA studies provide the only comprehensive assessment of outcomes and impact in infrastructure-related projects to date.
- Future direction. IFAD Management sees a high likelihood of significantly increasing future demand to IFAD for hard infrastructure investments, especially in middle-income countries, and with decreasing availability of concessional loans and grants for these countries. Any IFAD niche in infrastructure and increased future borrowing for infrastructure need to stay closely linked to IFAD's mandate to facilitate better access and sustainability.

III. Findings on infrastructure performance

101. This chapter reviews the performance of infrastructure in sample projects, using the IFAD evaluation criteria of effectiveness, efficiency, pro-poor targeting, gender equality and sustainability. Rural poverty impact is reviewed in chapter V.

102. In this chapter, section A examines the performance of hard infrastructure, while section B reviews the soft parts of infrastructure, such as user participation, ownership and capacities. Section C analyses the institutional arrangements for ownership and maintenance of infrastructure in view of the prospects for sustainability.

A. Performance of infrastructure in review sample

103. This assessment mainly draws from the structured review of 35 sample projects and the qualitative evidence gathered through the 10 case studies. Infrastructure activities in these projects were assessed through subcriteria specifically tailored to infrastructure, for example, infrastructure output targets and quality (effectiveness), unit costs (efficiency), O&M, and sustainability, apart from targeting and gender criteria.[32] The case studies provided additional insights on performance issues in relation to these criteria.

104. **Overall performance.** Analysis of sample projects found that infrastructure subprojects overall achieved the set targets. However, technical quality was not as high and arrangements for sustainability were often unsatisfactory. The most frequent infrastructure activities in the review sample – in terms of their numbers, not total amounts – were drinking water (and sanitation), irrigation and transport. Drinking water infrastructure overachieved its targets on average and had high utilization, indicating that this type of infrastructure responded well to the demands of poor households and women. However, technical quality was often mixed, and sustainability was, in the majority of cases, unsatisfactory. Overall, irrigation infrastructure achieved its targets, but technical quality and sustainability were unsatisfactory in the majority of cases. On average, transport infrastructure did not achieve its targets, and technical quality was mixed. While roads had high utilization and benefited the poor, their sustainability was mixed.

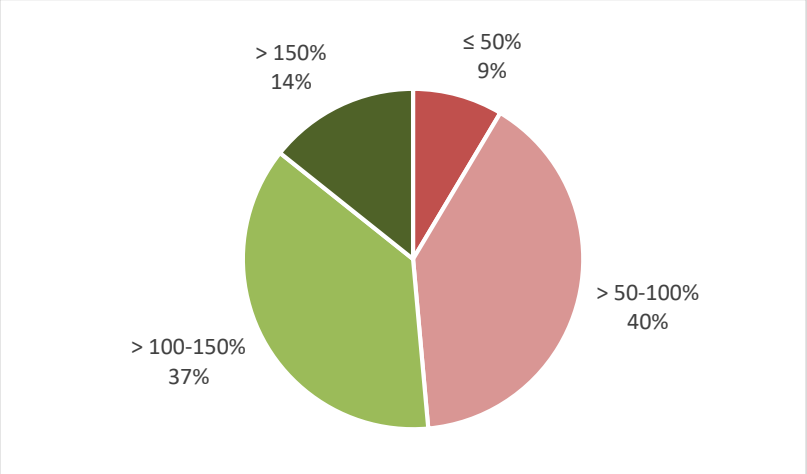
105. The review notes some difference in the performance of infrastructure by project types.[33] For example, CDD projects characterized by the highest levels of user participation overachieved their targets on average; however, infrastructure quality was mixed. Production and market-oriented projects generally performed poorly. They underachieved the set targets and their quality was, overall, more negative. Infrastructure-super-heavy projects overachieved their targets, but the quality was found to be insufficient. The latter two project types also performed relatively poorly in targeting women and poor people.

Effectiveness

106. **Achievement of output targets.** Overall, output targets for building or rehabilitating infrastructure were fully achieved or overachieved in half of the projects reviewed (see figure 11). The sample included five projects (14 per cent) that achieved their infrastructure targets by 150 per cent on average.[34] Three projects achieved less than 50 per cent of the infrastructure targets on average.[35]

[32] See annex VI for details of the review criteria.
[33] See chapter I.F for the definition of project types.
[34] Burkina Faso (#22), Kenya (#8), Nepal (#27), Tunisia (#33) and Turkey (#37).
[35] Burkina Faso (#23), Sri Lanka (#32) and Turkey (#20).

Figure 11
Achievement of physical infrastructure output targets (sample projects)



Source: ESR portfolio sample (35 projects).

107. On average, CDD projects overachieved their targets (115 per cent). For example, in Nepal (#27) infrastructure projects overachieved their targets.[36] Lao People's Democratic Republic (#9) stood out as a community-based project with consistently high achievements. Results in production- and market-focused projects were more mixed. Market infrastructure was found to be ineffective in several projects.[37]

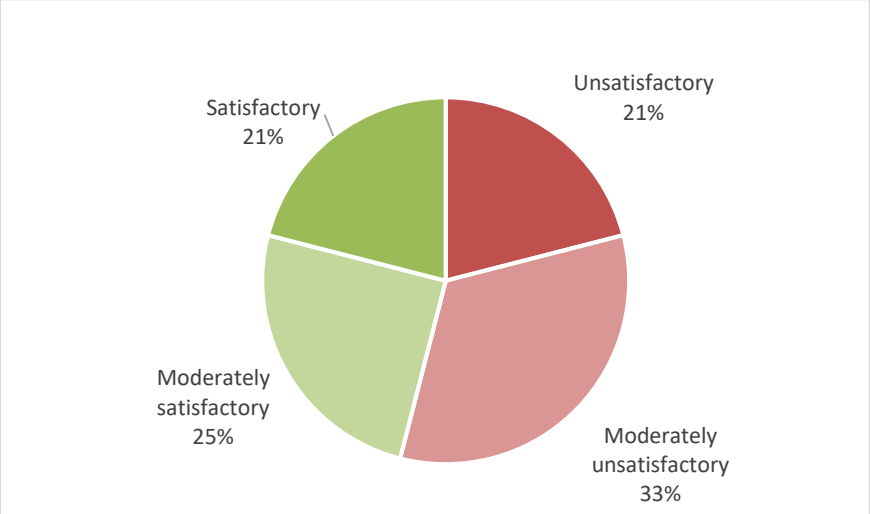
108. Drinking water and sanitation scored well in the sample, with an average of 131 per cent achievement of targets. Production infrastructure was at an average of 108 per cent achievement, slightly below the overall sample average of 115 per cent, while NRM infrastructure scored above average, at 143 per cent.

109. Irrigation, transport and marketplaces recorded a large number of low achievements (less than 75 per cent), although there was significant variation among the projects. Irrigation projects were successfully implemented in Armenia (#1). However, large irrigation activities failed in achieving their output targets in Burkina Faso (#23) and Mauritania (#12), and also in in Sri Lanka (#31 and #32) and Tunisia (#34). In one Sri Lanka case study (#48), 85 per cent of the field canals were not rehabilitated.

110. **The technical quality** of infrastructure according to agreed, contractual standards is often not mentioned in the reviewed project documents.[38] For 31 per cent of projects, the ESR did not find any information on the quality of constructed and rehabilitated infrastructure, and for an even larger number of infrastructure subcomponents/activities in these projects, the data were missing. In more than half of the remaining projects, infrastructure quality was assessed as not satisfactory (54 per cent), and for one fifth as unsatisfactory (see figure 12). This did not affect infrastructure utilization in one way or the other, which in general was high and above 90 per cent.

[36] Except for a "green road" that was not built at all as the World Food Programme pulled out of funding.
[37] For example, in Bhutan (#3), Cameroon (#25) and Kenya (#8).
[38] For ratings criteria and guidelines on assessment of technical quality of infrastructure, see annex VI.

Figure 12
Technical quality of physical infrastructure outputs (sample projects)



Source: ESR portfolio sample.

111. With regard to the technical quality of the infrastructure provided, the majority of production and market projects were found to be unsatisfactory. For the other project types it was more mixed. For example, in Bhutan (#3), the quality of roads was sacrificed for their quantity. Technical quality was also mixed in a number of CDD and community-based projects. In Nepal (#27), the technical quality of infrastructure was very low, although output achievements were very high. Poor quality of infrastructure was also found in Mauritania (#12), as well as in Cambodia (#24). Low quality may be related to weak technical supervision (e.g. Malawi [#38]) or low unit costs (see section on efficiency, below).

112. Overall, irrigation scored relatively poorly for technical quality, with 43 per cent in the lowest category.[39] Larger projects often provided better quality, such as irrigation in Turkey (#20), drinking water in Pakistan (#28), and biogas in China (#26). In United Republic of Tanzania (#19), it was the post-harvest and market infrastructure activities that were noted positively.

Efficiency

113. **Implementation of infrastructure subprojects** requires a number of well-sequenced steps. These are well known and include: subproject design and construction; timely participation of key institutions and beneficiaries: and the putting in place institutional arrangements and capacity-building for O&M well ahead of infrastructure and project completion (see figure A5.9.). All these activities require sometimes complex and lengthy procurement procedures for recruiting construction companies and other service providers. Participatory processes required for the identification and planning of infrastructure subprojects also require time. In the better-performing projects, the high level of beneficiaries' participation was coupled with effective engagement and coordination with the various levels of the governments (see section B below). Other key factors affecting the performance of infrastructure subprojects were adequate project preparation, with feasibility studies in advance of project kick-off, and effective co-funding arrangements and coordination with partner IFIs (see chapter IV.B). The key lessons on infrastructure performance are summarized in box 6.

[39] The quality of irrigation structures was scored poorly, for example, in Burkina Faso (#23), Georgia (#7) and Sri Lanka (#30 and #32).

Box 6
IFAD key lessons on infrastructure performance

The IFAD "How to do" toolkit for rural infrastructure investments of 2018 summarizes **six lessons** from infrastructure experience at IFAD (2018e, p. 6 ff):

Implementation readiness is key for successful rural infrastructure. This refers in particular to efficient and participatory infrastructure design, Social, Environmental and Climate Assessment Procedures (SECAP) and procurement processes.

Identification and involvement of key stakeholders in decisions, which includes not only users but also owners of infrastructure, as well as regulatory authorities, financiers of routine maintenance, and market partners with a stake in infrastructure.

Community-based management of rural infrastructure and community-based organizations need the support of a wider institutional system.

Incomes from construction labour should be targeted to specific IFAD target groups or categories, but attention needs to be paid to works that require advanced skill sets and use of machinery to ensure infrastructure standards and quality.

Appropriate choice of technologies, which includes their cost-effectiveness and maintenance requirements, and the size of their environmental footprint.

Smart procurement distinguishes timely and qualitative realization infrastructure, including the preparation of sound terms of reference and bidding documents for consultants and contractors early on in the process.

Source: IFAD, *How to Do: Toolkit for rural infrastructure investments* (2018).

114. **Implementation delays.** For most of the reviewed infrastructure projects, the ESR found relatively slow and more or less inefficient subproject implementation, specifically in 21 out of the 35 sample projects.[40] Four of these projects ended up with very low disbursements for infrastructure.[41] Evaluations reported significant delays in start-up, and slow project delivery and procurement. The time it takes for delivery, including infrastructure, is usually predictable at appraisal but rarely well respected.

115. Fast project start-up and timely disbursements helped with efficient infrastructure activities in at least 7 out of the 35 projects in the ESR portfolio sample.[42] Reasons for fast implementation included good project management unit (PMU) management and outsourcing of contracted work (Azerbaijan [#2]) and effective NGO service providers that helped with technical and socio-organizational efficiency (Madagascar [#11]). In recent years, IFAD has started to provide "Faster Implementation of Project Start-up" funds to advance technical feasibility and safeguards studies to mitigate infrastructure delays and increase quality.

116. **Unit costs.** Infrastructure unit costs need to be seen in view of infrastructure quality, benefits generated and the number of targeted beneficiaries using this infrastructure. Assessments are not always straightforward, as quality varies and the remote and marginal locations where IFAD often works have conditions under which simple comparisons with other areas are not justified. By and large, infrastructure unit costs in most places were reasonable in comparison with the construction of other infrastructure of similar quality standards in project areas. However, there were also exceptions of cost overruns, as detailed below.

117. In several projects reviewed by this ESR, infrastructure unit costs were found to be comparable to similar other government contracts or IFAD-supported projects, and

[40] Bhutan (#3), Burkina Faso (#23), Democratic Republic of the Congo (#6), Georgia (#7), Kenya (#8), Lao People's Democratic Republic (#8), Malawi (#38), Mauritania (#12 and #13), Morocco (#14), Mozambique (#36), Nepal (#27), Nigeria (#15), Pakistan (#16), Sri Lanka (#30, #31 and #32), Tunisia (#33), Turkey (#20 and #37) and Viet Nam (#35).
[41] Burkina Faso (#23), Georgia (#7), Mauritania (#12) and Morocco (#14).
[42] Azerbaijan (#2), Burkina Faso (#22), Cambodia (#24), China (#26), Lao People's Democratic Republic (#10), Madagascar (#11) and Rwanda (#17).

had been well budgeted.[43] In community-driven projects, beneficiaries' labour inputs often contributed strongly to low unit costs. In Nigeria (#15), the effective mobilization of community members in providing labour was an offsetting factor that reduced the cost of infrastructure works below appraisal estimates. Pakistan (#16 and #28) also reported good value for money, with a tendency of lower infrastructure costs and better quality than in comparable government schemes owing to strong community ownership and good technical oversight. To some extent, such infrastructure cost-efficiency gains came at the cost of the poor, who lost out on other income-generating work. This led to changes when new projects were designed (see box 7).

Box 7

Moving from unpaid community contributions to investments into the poor and future village infrastructure*

Unlike the prevailing practice in community executed schemes, where a community contribution of over 20 per cent is expected, the schemes under Economic Transformation Initiative (ETI) in Pakistan did not require any community contribution of labour or materials (project development report, 2015). The rationale was based on two important lessons. The contribution largely came at the cost of the poor, who ended up working for free and losing wage-labour opportunities on the scheme. Second, it is most often a disincentive for the community to develop the larger irrigation systems with high beneficiary contributions. The (new) ETI programme will pay the full cost, as approved by the programme coordination unit, for labour and materials. However, communities will agree to pay back 50 per cent cost of the scheme into a community-based account for future investments on their own social and economic development priorities in the village. This approach is expected to have a twofold benefit. First, the programme will pump almost half of the subcomponent cost (about US$22 million) into the economy of more than 200 villages in the shape of wages and local materials. Second, the recovered 50 per cent cost (again about US$20 million) will be reinvested in local social and economic development, bringing further economic benefits for the village economy.

* This project was not part of the portfolio sample or case study sample. The case study of a lesson learned in a relatively recently approved project (2015) is meant to illustrate a good practice.
Source: CSPE desk review (2020.

118. For some other projects, unit costs were significantly higher than planned. In Democratic Republic of the Congo (#6), costs were about 60 per cent above those planned for infrastructure rehabilitation, which doubled the unit costs per beneficiary. In United Republic of Tanzania (#19), there were very high warehouse construction costs during the first phase of the project, which were somewhat reduced in its second phase. For the Kenya market project (#8), major cost overruns were caused by the required change in the design of market facilities, which increased the cost of planning and construction. Additional costs were covered through government contributions. In Malawi (#38), the milk-bulking centres were oversized, lacked critical equipment, and were too far away from many producers, especially women. Their planning was poor, existing farmer organizations were not well involved, and private-sector involvement was limited. Other projects experienced delays (see box 8).

[43] For example, in Bhutan (#3), Madagascar (#11), Mozambique (#36) and Nepal (#28).

Box 8
Infrastructure delays and trade-offs in Turkey and Viet Nam

In Viet Nam (#35), the model of decentralizing the construction of infrastructure and selection of contractors seems to have been working reasonably well but required time and a high degree of coordination by local authorities with line ministries, particularly as projects were generally multi-component.

For Turkey (#37), the project was delayed for almost four years and led to a significant trade-off between efficiency and targeting. Delays were caused by difficulties in delivering the project in targeted remote villages, partly due to project staffing problems and the absorption capacity of poor farmers in these communities. During its last three years, the project redirected benefits to farmers' leaders and smallholder farmers in other areas, which made the project more efficient but largely reduced the impact on poor farmers.

Source: ESR case studies (2020).

119. Efficiency in terms of unit costs is relative to quality, and it is important to see it in terms of effectiveness and sustainability of generated infrastructure. There certainly can be a large trade-off between low unit costs on one hand and effectiveness and sustainability on the other. An example from Uganda demonstrates that higher unit costs may indeed lead to longer lasting roads (see box 9).

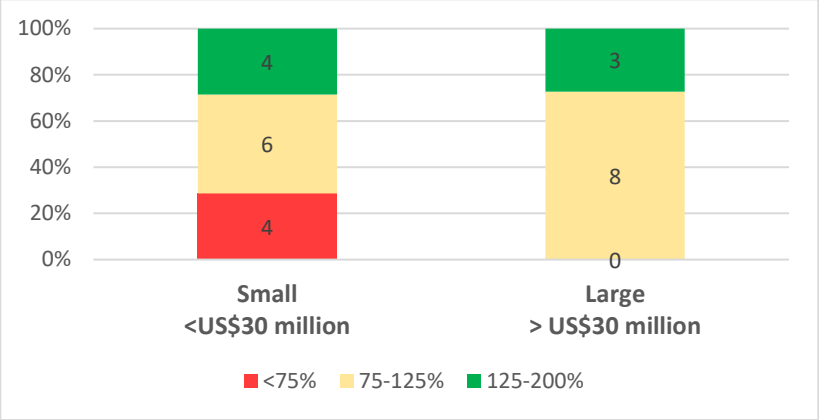
Box 9
Higher unit costs have improved impact and sustainability – roads in Uganda*

Roads are prominent in the IFAD Uganda portfolio. In recent years, IFAD has supported roads in line with class 3 districts roads standards (all-weather). This has been a key element in building more sustainable roads although costs are higher (by up to 76 per cent) and require higher design standards and environmental safeguards. These changes have led to delays in construction and reduced length compared to design. However, access to the Government's road fund and better efforts by local maintenance committees have helped in maintaining road quality. The use of geomapping of agricultural potential has helped place roads in the most appropriate locations, and the road length limit of 12 km has also helped reduce excessive political interference. The recent country strategy and programme evaluation (CSPE) has rated sustainability as high due to the upgraded design to all-weather standard, and therefore inclusion in the road fund for maintenance. Community satisfaction was found to be high across the seven roads visited during the CSPE field mission. There are good results in terms of reduced travel, higher farm-gate prices, and, based on CSPE field mission evidence, the roads have been generally maintained and kept in year-round operation.

*Example taken from the 2020 CSPE Uganda, which was not part of the project sample selection.
Source: CSPE Uganda 2020.

120. The ESR portfolio analysis also showed that infrastructure delivery and quality with project size to some extent increases. Economies of scale are an important part of the efficiency of infrastructure, as they ultimately reduce unit costs. Larger projects in the sample generally performed better in delivering infrastructure targets (see figure 13), which indicates economies of scale in infrastructure. Larger projects also often provided better infrastructure quality, such as irrigation in Turkey (#20), drinking water in Pakistan (#28), and biogas in China (#26). In United Republic of Tanzania (#19), it was the post-harvest and market infrastructure activities that were positively noted.

Figure 13
Infrastructure output targets achieved by project size (no. of projects)



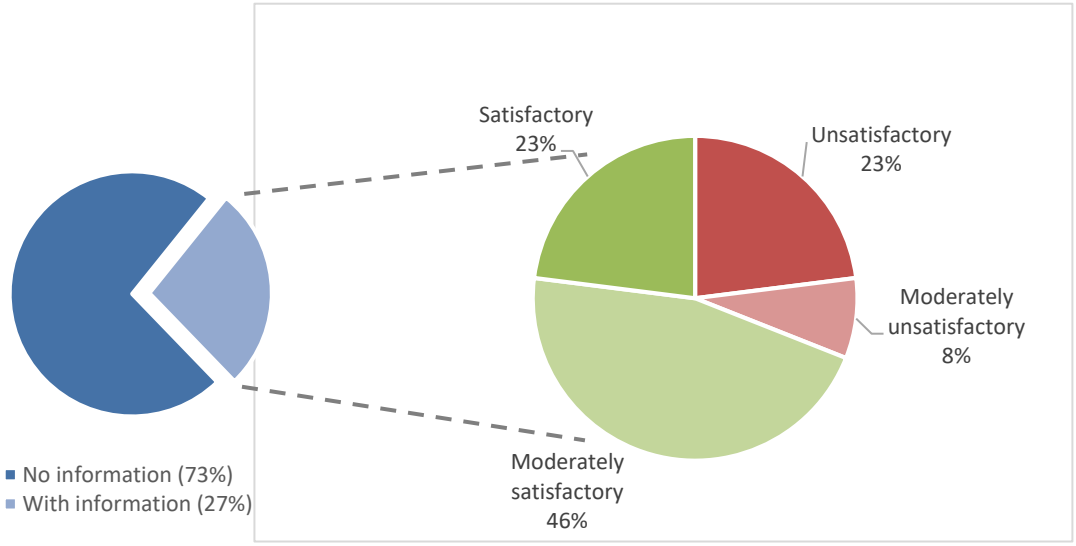
Source: ESR portfolio sample.

121. **Economic internal rate of return.** For many projects, the economic internal rates of return (EIRRs) were calculated, but the independent evaluations that this ESR is based on were mostly sceptical about assumptions made in the calculations. There were only very few projects in the ESR sample with validated positive EIRRs. For instance: PCRs overestimated incremental yields; data based on impact assessments turned out to be unrealistic; or costs for own farm labour were not considered. There also were economic internal rate of return (EIRR) overestimations due to changing timelines, increased project costs that were not incorporated, lower actual outreach numbers than planned, and changes in product prices that were inadequately considered. For Malawi (#37), the EIRR at completion was high but considered as grossly overstated due to the estimate of outreach, poor infrastructure effectiveness (outsized warehouses and limited beneficiary utilization), and missing baseline data. The EIRR calculation was also found to be too complex for the sample project in Lao People's Democratic Republic (#10), given the large range of infrastructure components and few comparable project experiences.

Pro-poor targeting, gender and youth

122. **Targeting.** Projects in the ESR portfolio sample showed generally positive targeting of the poor, but there was very little information in the reviewed reports on to what extent the poorest segments of the communities were actually reached with infrastructure. Information on this topic was missing in 63 per cent of the projects. However, where it was reported, it was mostly positive – 69 per cent of these projects showed moderately or fully satisfactory results for reaching the poor (see figure 14). This was particularly the case for social and NRM infrastructure, which were particularly pro-poor, in contrast to some of the market- and production-focused infrastructure (see figure A7.6.).

Figure 14
Reaching the poorest – performance in sample projects



Note: Score percentages refer to the 27 per cent of all sample projects where information was available in the reviewed reports on reaching the poorest. For 73 per cent of projects, no information was found for this variable.
Source: ESR portfolio sample.

123. **The pro-poor focus** of the infrastructure provided was rated satisfactory for all CDD and community-based projects, e.g. Pakistan (#16) and Rwanda (#17). This highlights the close link between community participation and pro-poor focus, also found by the ESR CDD. Pro-poor focus was mixed in the remaining project types.

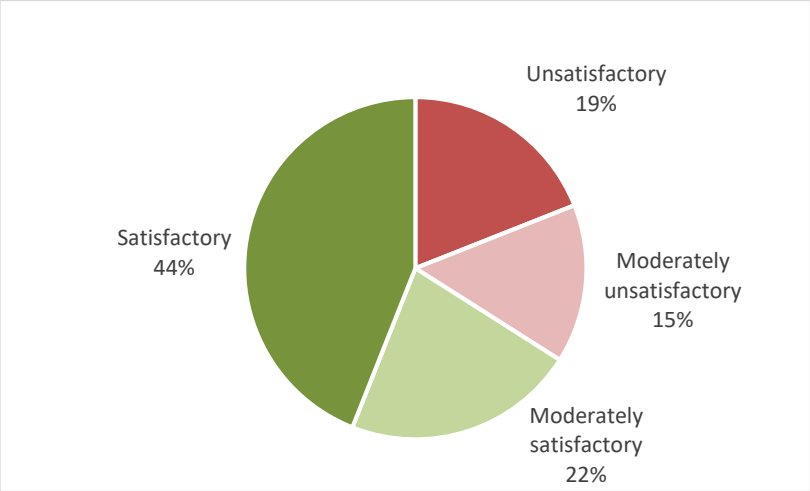
124. **Landless people.** Irrigation projects carried a high risk that those with less access to land would be excluded. For example, Sri Lanka (#48) failed to reach small farmers, poverty groups and women because landholdings were largely skewed towards the larger landholders, and the tenure situation was not sufficiently reflected in the design. Madagascar (#47) targeted primarily the landless and those farmers that owned land, but excluded the whole category of pastoral households. Bangladesh (#40) reached at least some of the poorer households farther from the connecting roads whose incremental incomes from the project were higher than those located closer to the roads. In Georgia (#44), there was a large gender gap for irrigation access and secure land tenure; fewer women owned irrigated land and used water services. The World Bank (2020) estimates that 28 per cent of all water users have a formal water delivery contract. The share is even lower among women water users, with only 18 per cent of them having formal contracts.

125. **Gender focus.** The portfolio analysis found very positive results for women's access to infrastructure. The indicator for targeting and engaging women was scored satisfactory in 66 per cent of all reviewed projects (see figure 15).[44] The focus on women was overall judged to be satisfactory for CDD and community-based projects, mainly because they included a mix of infrastructure activities, including social infrastructure that benefited women.[45] It was unsatisfactory for the majority of production and market projects and infrastructure-heavy projects.[46] Women were actively engaged in all IFAD infrastructure categories, especially social infrastructure, and, most prominently, energy, literacy and housing, and drinking water (with above average ratings and average scores), but also some of the production infrastructure. In contrast, there was a high frequency of low ratings for women's participation in certain other production activities and markets, including post-harvest. This once

[44] Noting that, for 8 of 35 projects, there was no information on this topic.
[45] Projects where women benefited well from infrastructure include Cambodia (#24), Lao People's Democratic Republic (#10), Madagascar (#11), Pakistan (#16) and Sudan (#18).
[46] Projects that scored particularly low included Malawi (#38), Mozambique (#36), Rwanda (#29) and Tunisia (#33).

again demonstrates the need for particular sensitivity to women in these important infrastructure macro areas.

Figure 15
Targeting and engaging women – performance in sample projects



Source: ESR portfolio sample.

126. **Youth.** For IFAD, engaging and impacting young people through its projects has become an important objective. For the reviewed projects, both case studies and sample portfolio, the impact on young people of infrastructure investments was rarely mentioned in the documents, including project development reports. Where it was, youth was often lumped together with women. Brazil (#43) and The Gambia (#46) are notable exceptions, but the results achieved in these two projects with young people were very modest.[47]

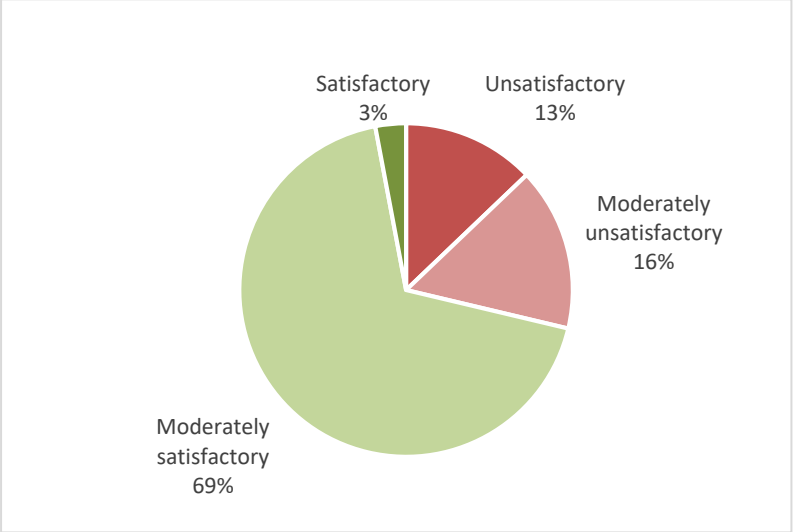
Operation and maintenance and sustainability

127. **Overall,** the review shows that most IFAD-supported projects do put in place some form of O&M arrangements to put the infrastructure to use, at least for as long as the projects last.

128. Institutional arrangements for O&M were found to be satisfactory in more than two thirds of the sample projects of the ESR review (a total of 72 per cent, with 3 per cent assessed as excellent) (see figure 16). There were no major differences in average scores across the major infrastructure categories and activities (see figure A7.4.). However, irrigation and transport infrastructure show more unsatisfactory O&M arrangements than the other infrastructure activities, while drinking water and sanitation, energy and marketplaces have better arrangements.

[47] In Brazil (#43), young people were mobilized to become local development agents and implement project activities at the community level (PCR, project performance assessment and RIA). In The Gambia (#46), the shortage of young people in rural areas was a concern as most of them migrate to urban areas or abroad.

Figure 16
Operation and maintenance performance in sample projects



Source: ESR portfolio sample.

129. O&M arrangements for infrastructure were found to be satisfactory for the majority of CDD and production and markets projects. Examples with overall satisfactory arrangements for O&M include the irrigation project in Armenia (#1), and infrastructure activities supporting marketplaces and village bakeries in Turkey (#20). For the other categories, the arrangements were mixed.[48]

130. Available funds are the biggest problem for operating and managing the infrastructure schemes, as shown by the portfolio sample review. This includes procuring or financing some simple equipment when groups are supposed to maintain infrastructures. Evaluations reviewed by this ESR do not provide a clear picture of the extent of beneficiary fees, contributions to O&M, and reasons for non-payment – which range from group financial management, to disputes over fair contribution amounts, requests of payment for work contributions, and lack of market access to afford cash payments. Roads are most successful where handled by local authorities with budgets for O&M. Social infrastructure is often well utilized but inadequately maintained due to the low capacity of beneficiaries and local administrations, and often due to unresolved questions about roles, responsibilities and infrastructure ownership. Almost nothing was found in the sampled portfolio and case studies on the actual capacity and willingness to pay by beneficiaries for infrastructure O&M.

131. **Sustainability** was not satisfactory in more than 60 per cent of projects in the sample, with 23 per cent found to be very poorly sustained over the long run (see figure 17). Only three projects out of 35 had satisfactory sustainability. In terms of infrastructure macro categories, social infrastructure was found to be least sustainable, with both below average scores and higher frequencies of very unsatisfactory ratings (see figure A7.5.). This is particularly visible in the relatively poor sustainability of health-related infrastructure. Marketplaces also tend to be among those that perform below average in sustainability. In contrast, post-harvest infrastructure is doing quite well, with only 17 per cent being unsustainable (i.e. one out of six projects).

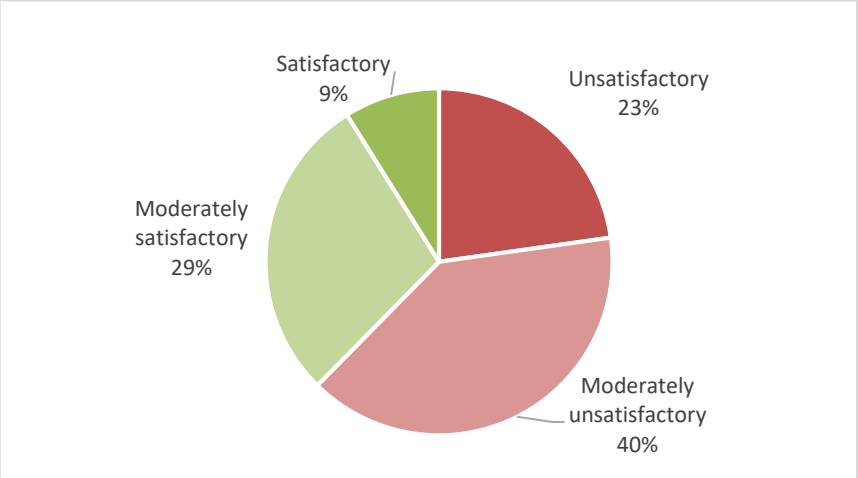
132. The sustainability of infrastructure was found unsatisfactory for the majority of projects regardless of project type. Positive outliers with very good performance on

[48] O&M arrangements were not satisfactory, for example, in Sri Lanka (#32) or Democratic Republic of the Congo (#6). Very poor O&M was found in Cambodia (#24), Cameroon (#25) and Rwanda (#29) for all infrastructure activities, and in Sri Lanka (#32) for irrigation. O&M did not work well for marketplaces in Mauritania (#12), literacy and housing in Nigeria (#15), and transport in Malawi (#38).

exit strategies and sustainability were found for irrigation activities in Armenia (#1), Rwanda (#17), Pakistan (#16) and Sri Lanka (#30), and for market systems in United Republic of Tanzania (#19).

133. Projects in Cambodia (#24), Cameroon (#25), Rwanda (#29) and Sri Lanka (#32) were characterized by particularly poor exit strategies and sustainability, fully aligned with their very poor scores for O&M reported above. The oasis project in Mauritania (#13) had weak sustainability for its irrigation and drinking water activities, more related to the poor quality of the infrastructure work than problems with O&M. Marketplace infrastructure was found to be unsustainable in the Kenya market project (#8) and for milk in Azerbaijan (#2), and there were no exit strategies or good sustainability for road infrastructure activities in Lao People's Democratic Republic (#9), Mozambique (#36) and Malawi (#38).

Figure 17
Performance of exit strategies and sustainability in sample projects



Source: ESR portfolio sample.

134. **Reasons for poor sustainability** include insufficient consideration of infrastructure ownership and maintenance at design, and the poor technical quality of infrastructure (see section on efficiency). Project design elements that would ensure infrastructure sustainability are not necessarily elaborated up front as part of the project design, and hence challenges arise later (for instance, reported in The Gambia [#46]). Infrastructure handover arrangements and ownership are insufficiently addressed in project documents. Ownership rights, for example, for post-harvest infrastructure provided by projects, are often resolved in time (see Malawi [38]). Government ownership and contributions to O&M beyond project end are critically important for sustainability in many of these projects. Such support is often there – maybe not to the extent necessary – but where it is not there at all, infrastructure sustainability is very weak or non-existent as in Chad (#45) and The Gambia (#46). Insufficient attention to capacities for O&M throughout also contributes to weak sustainability. O&M committees were frequently set up too late to be fully ready and capacitated to carry on after project completion. Complex infrastructure, such as an irrigation system, was more difficult to run and maintain, technically and management-wise, and also required appropriate institutional and policy frameworks in order to be sustainable.

B. User participation, ownership and capacities for operation and maintenance

135. **User participation and ownership.** Community mobilization and participation in subproject identification and planning is a common feature in most IFAD-supported projects. The main purpose is to enhance local ownership for the infrastructure built (see box 10). However, the extent and depth of participation may differ. Strong user participation and ownership are a key feature of CDD projects, and they are

expected to translate into enhanced capacity and responsibility for O&M of infrastructure. Community mobilization usually aims to strengthen demand orientation and ownership in infrastructure subprojects. Participation in construction is mainly focused on short-term employment benefits, without longer-term ownership. There were also cases without any user participation, resulting in a lack of ownership.

Box 10
Community ownership and sustainability in CDD projects

"Community ownership has enhanced the sustainability of community infrastructure." World Bank evaluations found that in community-driven development (CDD) projects there are often insufficient resources from the government and communities to ensure their operation and maintenance. Pressure to meet short-term targets often detracts attention from institutional reforms necessary to make service delivery systems sustainable in the longer term. The evaluation synthesis report (ESR) on CDD (2019) found that the participatory processes fostered community ownership of natural resources management and physical asset investments, which then helped to ensure their sustainability. However, larger capital investments, such as the expansion of irrigation schemes, could not be covered by the communities on their own without government support.

Source: ESR CDD.

136. **Community-driven approaches ("full participation").** Strong user participation throughout the entire project cycle is a key feature of community-based projects. Moreover, the ESR CDD identified those projects where communities had been given full responsibility to decide over the use of community development funds and manage the implementation process. A significant share of these funds was usually allocated for community infrastructure. Brazil (#43) used a participatory demand-driven approach to support a range of project activities that contributed to improved household and community welfare, including access to drinking water, improved agricultural productivity and social empowerment – particularly for women (impact assessment report 2018).

137. **Community mobilization (case studies).** User participation in other (non-CDD) projects mainly focused on needs identification and on planning and participation in construction activities. In Burundi (#42) and The Gambia (#46), there was a clear agenda to promote social mobilization with the aim of supporting participatory planning, of which infrastructure formed a part. In a number of other projects (Chad [#45], China [#41], Philippines [#49] and Sri Lanka [#48]), social mobilization was done, but no participatory plans prepared. In Chad (#45), the participatory pastoral assessment secured the buy-in of the transhumant population and ensured participatory decision-making with regard to water structures, in line with the communities' needs, as well as access rights for pastoralists. It also helped to identify the roles of women and youth in the pastoral activities, ways of conflict management, and well management, and enabled assessment of environmental consequences.

138. **Participation in construction.** In a number of cases, users actively participated in the construction of infrastructure projects. In Burundi (#42), water users and irrigation committees were trained by local NGOs to supervise the construction of infrastructure and manage its maintenance. In Bangladesh (#40), the participation of IFAD target groups in infrastructure subprojects was limited to their implementation, specifically through labour-contracting societies (LCS; see box 11), which enlisted destitute villagers in the construction work for small and medium-sized marketplaces and certain types of roads (block roads).

Box 11
Labour contracting societies in Bangladesh

In Bangladesh (#40), labour-contracting societies (LCS) hired destitute women (79 per cent), as well as men (21 per cent) to construct road and market infrastructure under the Coastal Climate Resilient Infrastructure Project (CCRIP). The LCSs promoted the principle of equal pay for equal work between men and women, although in some instances women beneficiaries still felt that the payment system was unfair. Payment delays of wages were also reported, with women having to resort to borrowing money at high interest rates. Moreover, accidents occurred involving LCS members and their children, after which the project made provisions for work-related insurance for LCS members.

LCS employment improved the economic status of some of the poorest households, and enhanced the skills and confidence of poor and vulnerable groups of women to some extent. However, the effects were mostly short-term due to difficulties finding further employment and a lack of complementary support for income-generating activities. Moreover, an RIA impact assessment found that the conservative sociocultural values and norms and family-related responsibilities were barriers to some women's participation in LCS, and acted as a constraint on women's economic empowerment more generally.

A countrywide policy study on LCS commissioned by IFAD in 2017 found that women often lacked a clear plan for investing the capital from LCS profits and needed more capacity-building and mentoring in order to make best use of the money. At times, LCS members subcontract skilled workers for tasks they are unable to do, frequently having to pay higher rates than allowed for in LCS contracts. Moreover, their contracts do not include provisions for price adjustments when material or labour costs increase as a result of project delays and seasonal or climatic factors (particularly common in the coastal region), which affects profit margins and can occasionally lead to LCS incurring financial losses.

Source: ESR case studies.

139. **No user participation.** There were also cases where users did not participate sufficiently. In these cases, the infrastructure was government-led only. For example, in Bangladesh (#40), the identification and planning of the infrastructure subprojects were undertaken at central level, with activities pre-selected and pre-approved by the Ministry of Local Government, Rural Development and Co-operatives in support of the Government's infrastructure investment planning. Similarly, in the case of Georgia (#44), rural infrastructure projects were selected in accordance with government (ministry, municipalities and the Georgian Amelioration Company) priorities/preferences, and did not include at least 50 per cent determined based on the value chain choices, as had been planned.[49]

140. **Capacity-building.** Project allocations for capacity-building are hard to quantify. Some projects may have a dedicated capacity-building component, but often training and capacity-building are also included in other components. The ESR identified budget allocations to capacity-building for sample projects, where possible.[50] For projects that had an allocation for capacity-building, it appeared that CDD projects had allocated up to 46 per cent of the project budget (15 per cent on average), followed by production and markets (up to 23 per cent, 15 per cent on average) and community-based projects (up to 22 per cent,13 per cent on average). The lowest allocations were found in the infrastructure-heavy projects (up to 10 per cent, 6 per cent on average).

141. The strengthening of community-level organizations through a long-term empowering approach was often a key feature of CDD projects.[51] In other cases, capacity-building was noted as insufficient (e.g. Sri Lanka [#48]), thus casting doubt on sustainability prospects. The same was noted in the case of the predecessor

[49] Insufficient user participation was also noted for Georgia (#7) (irrigation), Lao People's Democratic Republic (#8) (roads), and Lao People's Democratic Republic (#10) (social infrastructure). Women did not participate sufficiently in social infrastructure in Morocco (#14) and Turkey (#37).
[50] No budget allocations were found for 2 CDD projects, 4 production and market projects, and 3 infrastructure-heavy projects.
[51] Mauritania (#13), Nepal (#27), Nigeria (#15), Pakistan (#16) and Viet Nam (#35).

project to The Gambia (#46), which led to a need for the continued support to the farmers' organizations, women and youth *kafos* on managerial, governance and technical skills. The same happened in Madagascar (#47), where the project was extended for several reasons, one of them being the realization that the user groups were not strong enough to ensure the sustainable management of the infrastructure.

142. **User groups.** The formation and strengthening of user groups (e.g. WUAs) is an important mechanism for the involvement of the users in the governance/O&M of infrastructure. Support to WUAs and farmers' organizations helps farmers to mobilize and tackle common issues, also providing a mechanism for IFAD to channel capacity-building assistance. Within the sample of 35 projects, 25 were supporting user groups. In the successful cases, the user groups were able to prepare their organizational O&M and financial plans (Philippines [#49]) and were capable of bookkeeping and ensuring supervision of their activities (Chad [#45]). WUAs are an important way of organizing farmers for sustainable water management. However, IFAD's experience with WUAs is mixed, as summarized by the ESR on water (see box 12).

Box 12
IFAD's experience with water users' associations

As an instrument of representative and participatory governance, water users' associations (WUAs) are something that IFAD has strongly and consistently promoted over many years. It can be justifiably proud of this successful and widely adopted institutional innovation. WUAs are the preferred institutional arrangement for management of group- or canal-based irrigation projects. However, IFAD's experience in regard to WUAs is mixed. IFAD has learned that for a WUA to function effectively and sustainably, several key factors must come together, such as: a reliable and adequate supply of water and energy that is fairly distributed; adequate social capital and good leadership; technically sound design with easily manageable technologies deployed; long-term security of land tenure and water rights; viable returns on agriculture; women actively participating in decision-making; value addition and efficient farm-to-market value chains; an enabling legal framework; and availability of sound technical and managerial skills.

Source: ESR Water Conservation and Management Evaluation (2014).

143. Often, capacity-building was not sufficient to ensure the sustainability of the infrastructure built (see the discussion on in section A, above). The project sample includes seven cases where capacity-building was found insufficient. In another four cases, user groups were found to be inactive or too weak. Finally, there were also cases where user groups were not able to access the financial or material resources to become effective. More generally, user groups were stronger in community-driven and community-based projects. They were often not sufficiently strong to perform their roles in production and market-access projects.[52]

144. For example, in Azerbaijan (#2), support for livestock producers' associations through better storage capacities, marketing and packaging facilities and processing outlets has not been working well as the project simply allocated insufficient resources and time to it and saw it more as an add-on subcomponent to the main irrigation activities (which also helped, but mainly with livestock drinking water). For Turkey (#20 and #37), there was little attention given to support and strengthening

[52] In four cases, user groups were found to perform very poorly (Kenya [#8], Mauritania [#13], Rwanda [#29] and Sudan [#18]). In five cases, they performed very well (Armenia [#1], Lao People's Democratic Republic [#8], Madagascar [#11], Nepal [#27] and Rwanda [#17]).

farmers and farmers' organizations institutionally across a wider range of livestock-related activities, which at least partly explains their lack of competitiveness.[53]

Box 13
Strengthening user groups in Burundi

In Burundi, producers' organizations and collection/processing centres for livestock and milk products show some positive results after several years of support through various IFAD-supported projects. However, there are continued concerns about: the matching of changing market demands; the legal ownership of collection, storage and processing infrastructure; institutional capacities of producers' organizations and cooperatives; regular member financial contributions; and stimulation of and networking with the private sector. One of the more recent developments has been a partnership agreement with a private sector actor (Modern Dairy Burundi) for milk collection, which is currently being evaluated in the ongoing country strategy and programme evaluation (CSPE).

In Burundi (#42), programme interventions initially showed some signs of sustainability due to the high degree of programme ownership by local populations, participative community development approaches, good financial returns on several activities, and partnerships with NGOs and other IFAD-supported projects. However, ultimately, the weak capacity of operation and maintenance user groups (and the viability of community groups in general) was seen as limiting infrastructure sustainability. Membership in these groups was often motivated by project incentives (such as payments for work), and their rapidly changing composition was challenging. (This information is based on the Rural Recovery and Development Programme 2011-2012 project performance evaluation and project completion report validation.)

After completion of Burundi (#42) and similar experiences in other projects, the 2016 Burundi country strategic opportunities programme (COSOP) acknowledged that: "limited arrangements for infrastructure maintenance do not allow for sustainability" of infrastructure projects. The COSOP identified a number of very specific constraints, including institutional and governance challenges, and suggested, among others, a policy dialogue should be initiated for a stronger enabling policy and regulatory environment. This should support sustainable infrastructure investments through institutionally and legally strengthened user and producer groups and clearer ownership arrangements. Progress on results concerning these and other institutional strengthening objectives will be documented in the 2020 CSPE Burundi (forthcoming).

Source: ESR case studies.

145. Strong (capacitated) user groups are important prerequisites for sustainability, but capacity needs to be understood widely. Training, even if delivered on time and enough, is not sufficient. These groups need clear mandates, operational guidelines, and clear engagement rules with the governments (see box 13). They need clear financing mechanisms, aiming at self-sufficiency and cost recovery. However, if government subsidies are needed, they need to be transparent and non-distortionary (better in the form of output-based aid and for connection rather than operation purposes). The role and performance of user groups in the O&M of infrastructure is further explored in the following section.

C. Institutional models and sustainability

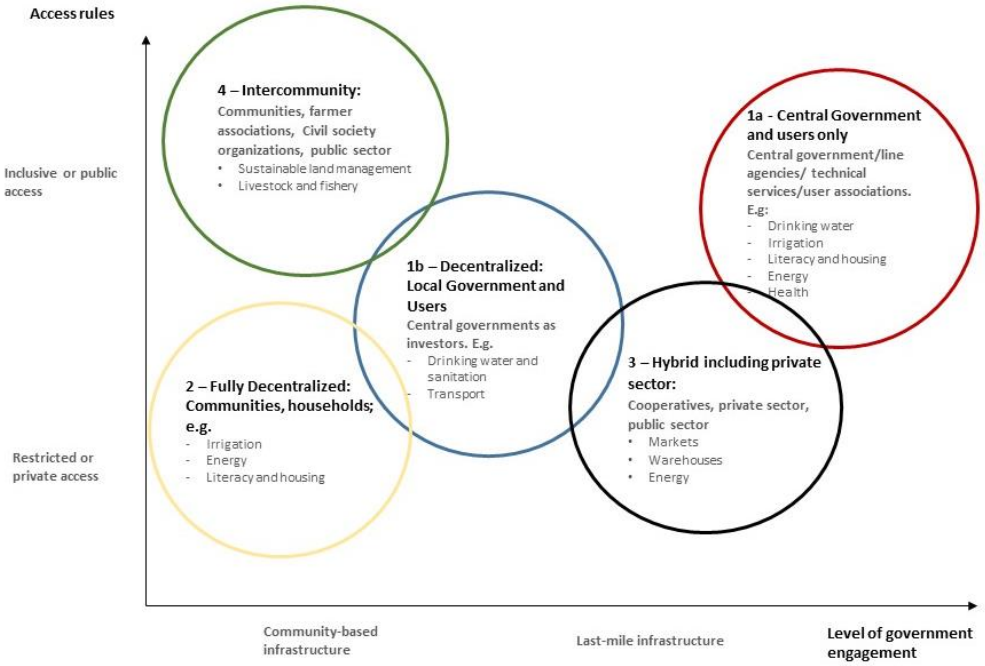
Institutional ownership and management models for infrastructure

146. **Types of ownership and governance.** The ESR identified five basic types of institutional ownership and governance arrangements for infrastructure that have major consequences for its planning, user participation and access, O&M, and sustainability (see figure 18). Each model has a different composition of institutions

[53] In the Ardahan-Kars-Artvin Development Project (#37), the associations established by the project for milk collection could not compete with existing privately-owned milk collectors, and four milk collection centres were not functioning at the time of the PPE. Private collectors had the advantage that they made advance payments to dairy producers for six months, although such payments were later offset by lower unit costs for purchased milk. In the Agricultural Marketing Systems Development Programme (#20), the smaller milk tanks supplied to farmers quickly became obsolete as private-dairy supply chains and farm-level milk collection became more firmly established, and as larger tanks substituted for on-farm ones.

and users that provide capital for construction, are responsible for O&M and its costs, and own infrastructure assets in the end: model 1a involves mainly central government and infrastructure users; model 1b relies on decentralized local governments and users; in model 2 infrastructure is fully decentralized to communities and households, without major government involvement except for providing the basic capital investment (for instance, in the form of community development funds); model 3 is a hybrid version with potential actors from various government levels, users and private sector entrepreneurs or cooperatives; and model 4 includes different actors that join across communities, for common natural resource planning, utilization and related infrastructure ("intercommunity").

Figure 18
Institutional models in review sample



Source: ESR compilation.

147. These models have different forms of governance, government involvement and beneficiary participation, as well as access rules. The first three models (models 1a, 1b and 2) covered 88 per cent of all infrastructure activities in the review sample. They were commonly linked to CDD and community-based projects, but also found in other projects. The hybrid models including the private sector and intercommunity arrangements were more common in production-, market- and value-chain-oriented projects. A majority of infrastructure activities (68 per cent) were decentralized to local governments and communities (models 1b and 2).

148. These are explanatory models; they are not prescriptive; and they are also **not** mutually exclusive. Often, several models are found in a single project, depending on the different categories and types of infrastructure.

Strengths and weaknesses of institutional arrangements

149. **Centralized model (model 1a).** This model has been most common for irrigation and drainage infrastructure; with central government line ministries or agencies responsible for the main canals and WUAs in charge of secondary or tertiary canals. However, centralized models were also common for certain social infrastructure (e.g. education, government-operated health centres, and housing). Much of social community or district infrastructure is staffed, equipped and maintained by line ministries, such as schools, or set up by central government agencies after emergencies, such as housing. Ownership stays either with the government as a

public good, or is shared with users; the same holds for O&M (see box 14). Access could be free or may require an obligatory user fee.

Box 14
Government retains a central role in irrigation in Georgia

For **Georgia (#44)**, the Georgian Amelioration Company (GAC), a government agency, is responsible for O&M of irrigation systems down to the farmer level. Individual service contracts are signed annually with each landowner for water supply. In the absence of formal local water users' organizations, most irrigation systems rely on informal local arrangements to distribute water and clean ditches. Current local water delivery is scheduled upon demand from farmers, relayed to a ditch-level GAC "regulator" and then aggregated upward.

Source: ESR case studies.

150. Government engagement and the extent of beneficiary participation depend a lot on the governance context. This model often has been top-down, but it could also involve community-based approaches and user groups. In terms of performance, this model appeared the most inclusive and had the highest number of satisfactory scores for targeting women in the review sample (see various figures on model performance in section III of annex VII). Targeting criteria were often more stringently applied in this set-up. Membership criteria and user fees were sometimes barriers for use, especially for the poor. In the review sample, sustainability was satisfactory under this model for energy, transport, livestock and fishery, irrigation and post-harvest infrastructure. In other cases, government was not involved in O&M after project completion, and sustainability was weak as a result.

151. Central government has shown strong ownership in some places and taken over an active role in O&M, for example, through common guidelines (China [#47]), a GIS-based inventory of irrigation systems (Sri Lanka [#48]), or extensive technical and thematic training (Madagascar [#47]). In Philippines (#49), the Government invested in infrastructure, in parallel to IFAD, through the Farmers' Equity Fund and facilitated the convergence and horizontal integration of participating agencies in project implementation – thus maximizing resources and ensuring more focused interventions to rice productivity.

152. In some other case studies, government ownership and capacities on the ground were reportedly not strong enough. In Chad (#45), for example, the mobile schooling stopped even before the end of the project as the Department of Education did not take over operations as planned. Similarly, for The Gambia (#46), the Government did not have the capacity and political will to contribute to the long-term technical and financial sustainability of agricultural water infrastructure. While moving to sturdier and durable infrastructure for lowland rice production, IFAD has not yet convinced the Government to adopt the infrastructure as a public good in order to ensure its sustainability.

153. **Decentralized model, with local government (model 1b).** In the case of the decentralized model, local government is the public entity that owns and manages the infrastructure together with users to various degrees, depending on its administrative and finance capacities. Typical examples are intra- and inter-community roads, markets and some forms of communal social infrastructure, for instance, in health, occasionally with fees being raised to pay for maintenance. In the review sample, this was the most common model for transport and drinking water and sanitation infrastructure.

154. In this model, infrastructure is directly managed by local governments or potentially by multi-stakeholder governance arrangements, for instance, in market management committees or road user associations that are supported through local governments, but also in irrigation (see box 15). Sustainability depends on local government's ability to raise O&M funds. Sustainability under this model was scored

satisfactory for all infrastructure categories, except for markets and livestock and fishery. The effectiveness of targeting was more variable in this decentralized, local government model and it scored lower on targeting women than model 1a, but was overall satisfactory on the latter.

Box 15
Institutional arrangements on markets, roads and irrigation

Markets: In Bangladesh (#40), the maintenance of marketplaces is ensured through the collection of fees from traders by the local government (Upazila). Twenty-five per cent of these lease fees are earmarked, passed on to market management committees, and used for long-term maintenance. Better-managed markets with more participants collected higher rents that were used to operate and maintain the markets in a sustainable manner (study by the Research and Impact Assessment Division). No major issues were noted regarding the allocation and use of these funds, other than leases being set at too low a rate in some instances and proving insufficient to cover the costs of maintenance. However, there is a trade-off between sustainable financial fees for market stalls and their effective use by IFAD's target groups. Policy measures would be needed to address this trade-off, specifically in view of poorer beneficiaries, e.g. through varied rates, and closer collection points. There were instances when the farmers were trading outside the market, and not inside, to avoid paying rental fees.

Roads: Local or provincial government are usually in charge of operation and maintenance (O&M), in some cases also user associations. Local and provincial governments were in charge of the maintenance of the roads and bridges in Bangladesh (#40), Georgia (#44) and Sri Lanka (#48), partly financed through central government general budgets. In Madagascar (#47), the rural roads were under the O&M of road users' associations, which worked in partnership with the communes. The latter collected taxes on market days, with associations joining in collecting contributions and tolls, as well as mobilizing the communities to maintain the roads. Beneficiaries preferred to maintain the roads on a voluntary basis rather than through these institutions.

Irrigation: In Madagascar (#47), various farmers' organizations* are in charge of the O&M of the irrigation network (and roads) under the supervision of local administrations. For the water structures (irrigation and flood control), before construction started, the local authorities helped establish water users' associations to manage and maintain them on a fee basis. At project completion (the end of Phase I), 55 per cent of the user groups were judged as having advanced financial and operational autonomy, and so many of them were still supported by the communes

*Very diverse, depending on the common interests: "users associations for water, roads, or association of rice producers, vegetables, fishermen, dressmaker, craftsperson and so on" (Project Development Report, para. 109, p. 31). The most documented are the first two.
Source: ESR case studies.

155. **Fully decentralized model (model 2).** This refers to a situation where users alone own, operate and maintain the infrastructure. This is often the case in CDD projects, and could include local wells, water tanks and small-scale irrigation and feeder roads, but also some social infrastructure where the state is not very present and active. It also refers to household-level infrastructure, such as certain forms of water and sanitation or decentralized, renewable energy. In this model, users are usually fully responsible for O&M and replacement. In the review sample, this model was most frequently found for irrigation infrastructure, drinking water and roads.

156. This model usually involves high participation and ownership by community-based organizations as well as by households themselves. In certain cases, user fees could be a barrier for infrastructure use as well as favour elite capture. Sustainability is an issue for public goods that do not charge fees, or fees that are below O&M and replacement costs, or when household owners do not have the resources to take care of such infrastructure. This is less of a problem for revenue-generating productive and market infrastructure than for social infrastructure.

157. The fully decentralized model had a mixed performance on inclusion. It was able to include women in about half of the cases. However, women often remained underrepresented in WUAs (IFAD IOE, 2014).

158. Technical quality and achievement of targets have been mixed. Sustainability was scored unsatisfactory for all infrastructure categories, except for land management and livestock and fishery. This is mainly related to insufficient capacities of user groups to maintain the infrastructure, and their often incomplete integration into institutional frameworks such as irrigation networks.

159. In some cases, the decentralized model resulted in insufficient buy-in from government. This was the case in Brazil (#43), where municipal governments were not involved in planning and implementing project activities, nor in infrastructure O&M. Coordination and sustainability of the infrastructure activities were weak as a result and missed out on synergies.

160. **Hybrid model, with private sector participation (model 3).** This model is usually the way how market and value added infrastructure is organized and governed, except for roads and other transport links. It often relies on small entrepreneurs (micro, small and medium-sized enterprises [MSMEs]), private-sector (SMEs) and farmers' organizations or cooperatives beyond community level, sometimes in multi-stakeholder and public-private-producer partnerships). It could also involve local and central government agencies depending on their capacities, local presence, and mandates. This governance model would typically refer to non-government-run storage facilities, local and regional markets, other product aggregation facilities (such as for milk collection) and value-adding processing centres. There could be a wide range of asset ownership and sharing of costs, with assets being publicly or privately held and usage fees being charged. Access and benefits could be limited to group members (e.g. in cooperatives).

161. This model requires functioning farmers' organizations, cooperatives and MSMEs/SMEs that are capable and willing to engage with one another other and the project. For market infrastructure, the potential for public-private partnerships depends on the commodity subsector, existing private sector operations, and the specific type of infrastructure and linkages. These partnerships are more likely where there is no competition and there are mutual benefits for value chain actors (such as in out-grower schemes, processing or the dairy industry) or where product quality matters a lot. There could also be public-private partnerships in production, which sometimes happens on the input side, but is relatively rare in infrastructure ownership and management in IFAD-supported projects. Private enterprises are mostly engaged in infrastructure construction, rarely in O&M.

162. This model relies on clear rules and enforcement of governance and access, often by governments, to offer good opportunities for smallholder farmers and women. Elite capture could be an issue, for instance, in collection, storage and processing, and unfavourable conditions could be generated for IFAD's target groups.[54] The advantage of this model is that it is revenue-generating, which increases the likelihood of sustainability. For market access, market fees could be access barriers for the poor and for women. Other barriers could take the form of distance to markets/processing centres or elite capture (e.g. in Bangladesh [#40]).

163. Only a few cases have been found for this model in the ESR portfolio (e.g. Malawi [#38]), and none in the case studies, but it seems to work for sustainability of energy, markets, value addition and post-harvest infrastructure. Please also refer to chapter IV.A for a discussion on how market access and value chain infrastructure operated.

[54] For example, Malawi (#38) reported that there were still unresolved ownership issues that prevented community members from using one of the warehouses built.

164. **Intercommunity model (model 4).** This model is mainly concerned with NRM, such as watershed infrastructure, larger soil and water conservation schemes, and access infrastructure that requires intercommunity planning and management beyond the individual community. This could involve local and central governments, where available, interested and mandated. It often includes specialized civil society organizations. Generated structures could be community, group or individually owned. Typical cases for this model are watershed management or NRM projects.

165. This model is potentially highly participatory but requires a lot of understanding and awareness-raising of the issues at stake and of the various technical options for necessary infrastructure and water/soil management investments and their impacts. Different and diverging interests will have to be mediated through establishing and managing multi-stakeholder platforms, which local governments are unlikely to have the capacity for. Allocation of investment funds is likely to be difficult. Unless buffered by continued local or regional support, technical and financial sustainability are likely to be an issue (see box 16 for two examples of this model). In the review sample, this model worked well on sustainability of drinking water and sanitation, and for sustainable land management.

Box 16
Example for institutional arrangements on natural resources management

In **Chad (#45)**, intercommunity committees ensured the management, technical maintenance and protection of wells, ponds and other hydroinfrastructure that were far from the villages and nomad camps and used by several communities. They ensured adherence by all users to the transhumant corridors (190 km) marked out by the project, and the management of potential conflicts. The user populations were in charge of day-to-day management. Contributions other than in-kind were not deemed necessary; and users took care of buckets and ropes as well as water-drawing. Operation and maintenance (O&M) management built on traditional practices.

In **The Gambia (#46)**, the sustainable management of the tidal irrigation schemes as part of O&M was beyond the capacity of farmers' organizations. This was because proper drainage required floodgate management according to tides and rains and the intervention of a technician. Community-prepared watershed management plans were a precondition for communities and water users' groups to be eligible for project support. However, they were drawn up for individual villages and not by watershed involving all communities and beneficiaries of the irrigation scheme. This reduced their usefulness. Similarly, beneficiary contributions for O&M were, in the end, insufficient to operate and maintain infrastructure without continued government support.

Source: ESR case studies.

166. Some other aspects and examples of this models are presented and discussed in other parts of this report.

167. **Concluding overview.** Table 8 shows the exit strategies and prospects for sustainability for different governance models, as observed in the review sample.[55] It shows that the decentralized model, with local government, worked well for most types of infrastructure. However, the limited (human and financial) resources of local governments were also noted as limiting sustainability in a number of cases (see chapter IV.A) Communities on their own were not able to maintain most types of infrastructure, with the notable exception of some productive infrastructure. Centralized governance models worked for infrastructure, such as transport, energy and irrigation. Private sector participation was beneficial for post-harvest, value addition, market and energy infrastructure. Intercommunity models helped to strengthen the sustainability of NRM and water-related infrastructure.

[55] For 129 infrastructure categories scored in 35 projects.

Table 8
Exit and sustainability performance by institutional model and infrastructure (sub)categories

	Centralized model	*Decentralized model with local government*	*Fully decentralized to communities*	*Hybrid model with private sector*	*Intercommunity model*
Production					
Irrigation	+	+	-	-	+
Livestock and fishery	+	-	+		-
Post-harvest		+	-	+	
Market access					
Transport	+	+	-		
Markets		-	-	+	
Value addition		+	-	+	
Social					
Drinking water and sanitation	-	+	-		+
Literacy and housing	-	+	-		
Energy	+		-	+	
Health	-	+	-		
Natural resources management					
Sustainable land management	-	+	+		+
Overall	+	+	-	+	+

Legend:		
	+	Satisfactory scores
	-	Non-satisfactory scores
		No case observed

Source: ESR compilation.

Dynamic ownership, management models and sustainability

168. Institutional models for infrastructure ownership and management are not static but dynamic, as already noted for fully decentralized models that usually benefit from some form of local government involvement, particularly for sustainability. Changes or the absence of certain institutional players also change the dynamics and affect, in particular, sustainability. For instance, in Philippines (#49), the continued operation and sustainability of infrastructure has become a concern in recent years since cost recovery switched from "irrigator service fees" collected through project/government agents to an "irrigator association management fee" under the responsibility of user groups (Arslan et al., 2018, p.33). This arrangement reduced the fee amounts collected from farmers. In Sri Lanka (#48), farmers' organizations were supposed to be in charge, but they were unwilling to take on management of the field canals that were rehabilitated only to 15 per cent.

169. The uncertainties associated with certain de facto decentralized models, and partial government ownership but with unclear mutual expectations (and capacities) is apparent in Burundi and The Gambia. Sustainability of infrastructure benefits was a challenge in most IFAD-supported interventions in The Gambia, particularly in water and irrigation development (IFAD 2015/16 CSPE The Gambia). This includes with all likelihood case study #46, which is still ongoing. The reasons are found in the absence of beneficiary ownership, the virtual absence of government O&M contributions beyond project completion, along with poor quality and therefore underutilized water infrastructure.

170. In Madagascar (#47), the importance of land ownership was an issue, as also in other countries. In Madagascar, the project proactively promoted improved land rights, with support to land offices and a land certificate system. However, there is

lingering uncertainty about the land certificates, as small producers have show little interest in land securitization in the project's sparsely populated areas, and few have been willing to pay for them. This has been compounded by a slowdown among national land offices, and the law on contractual land rights is not yet in force.[56]

[56] Madagascar CSPE 2020, p. 26, paras. 85 and 86 (June version).

Key points (chapter III)

- **Effectiveness.** About half of the projects reviewed have achieved or even overachieved their infrastructure targets. CDD projects achieved their targets for all types of (social and productive) infrastructure. Results in production- and market-focused projects were more mixed. Market infrastructure was found ineffective in several projects.
- **Technical quality.** With regard to the technical quality of the infrastructure provided, the majority of production- and market-focused projects were found to be unsatisfactory. For the other project types, the situation was more mixed. Technical infrastructure quality is often not sufficiently monitored and reported.
- **Efficiency.** Evaluations reported significant delays in start-up, and slow project delivery and procurement. The time it takes for delivery, including infrastructure, is usually predictable at appraisal but rarely well acknowledged. Reasons for rapid implementation included good PMU management and outsourcing of contracted work, and effective NGO service providers that helped with technical and socio-organizational efficiency.
- **Targeting.** The pro-poor focus of the infrastructure provided was rated satisfactory for all CDD and community-based projects. Irrigation and road projects were prone to "placement biases," with a risk of excluding the very poor.
- **Gender focus.** The portfolio analysis found very positive results for women's access to infrastructure. Focus on women was overall satisfactory for CDD and community-based projects, mainly because they included a mix of infrastructure activities, including social infrastructure that benefited women.
- **O&M.** Available funds are the biggest problem for operating and managing the infrastructure schemes as shown by the portfolio sample review. This includes procuring or financing some simple equipment when groups are supposed to maintain infrastructures.
- **Sustainability.** Sustainability was not satisfactory in more than 60 per cent of projects in the sample. O&M committees were frequently set up too late to be fully ready and capacitated to carry on after project completion. Complex infrastructure, such as an irrigation system, was more difficult to run and maintain. Infrastructure handover arrangements and ownership were poorly described in project documents.
- **User participation, ownership and capacities for O&M.** Community mobilization and participation enhanced local ownership for the infrastructure built.
- **Institutional models and sustainability.** The ESR identified several basic types of institutional ownership and governance arrangements for infrastructure.
- The **centralized model**, with central government in charge of the implementation and (to varying degrees) O&M, appeared the most inclusive and had the highest number of satisfactory scores for targeting women in the review sample. Sustainability was found satisfactory under this model for energy, transport, livestock and fishery, irrigation and post-harvest infrastructure.
- The **decentralized model**, with local government owning and managing the infrastructure together with users, was scored satisfactory for all infrastructure categories, except for markets and livestock and fishery.
- **Hybrid models, with private sector participation** seem to work for sustainability of energy, markets, value addition and post-harvest infrastructure.
- **The intercommunity model** is highly participatory but requires substantial awareness-raising and capacity-building. In the review sample, this model worked well on sustainability of drinking water and sanitation, and sustainable land management.

IV. Findings on partnerships and cofinancing

A. Government partners and partner performance

Government demand and transaction costs

171. The review of the CSPEs for the Top Ten infrastructure portfolios provided some important lessons on the opportunities and limitations for IFAD to scale up its infrastructure investments. Opportunities are mainly related to governments' demand (and preference) for investments into tangible assets that provide lasting economic returns. The limitations are related to the partnerships required, which often lead to higher transaction costs.

172. The CSPEs noted governments' preference for (hard) infrastructure investments in several cases, e.g. Bangladesh, Cambodia, Egypt and Uganda. In some countries the focus on infrastructure was driven by a long-term partnership with a particular infrastructure-oriented government agency, for example, the Local Government Engineering Department, or the Palli Karma-Sahayak Foundation in Bangladesh. In Democratic Republic of the Congo, the default partner is the Ministry of Rural Development, which provides specialized technical services, such as the national rural hydraulic service, the directorate for feeder roads, and the national service for urban and peri-urban horticulture.

173. Transaction costs are in particular required for dealing with social and environmental safeguards. There is a perception among IFAD staff and management that SECAP discourages regional directors and CPMs from pursuing certain infrastructure investment demands in their projects. For some countries, client governments are reportedly reluctant to engage with IFAD in infrastructure, in particular for category A projects. Category A projects have the highest standards and requirements for risk assessments and mitigation. This may partly explain why there have been few category A projects to date at IFAD.[57] IFAD staff in the field and government clients are also concerned about the additional costs for assessments, possible delays and reputational risks. There may be complications from grievance mechanisms and liability during implementation, in particular in countries with strong civil societies.

174. In countries where IFAD maintains long-standing partnerships with other IFIs, safeguards were often taken care of by the cofinancing partners. These cofinancing partnerships were found in all Top Ten infrastructure countries. The partnership with the ADB was the most common one, found in Afghanistan, Bangladesh, Cambodia, Philippines and Sri Lanka.[58] However, engagement with a large number of partners also increased the transaction costs for IFAD and the government, as shown in box 17. This was similar in Uganda, where the country programme evaluation (2013) noted the increased transaction costs of the IFAD-AfDB partnership.

[57] Nine out of 236 projects in IFAD's active portfolio are classified as category A (4 per cent), and 2 out of 37 projects in IFAD's current pipeline of projects are classified as category A (6 per cent). Four ongoing category A projects are in ESA: Angola, Ethiopia, Malawi and Uganda.

[58] Cofinancing partnerships were also with the World Bank (e.g. Afghanistan and Niger), AfDB (Uganda), and OFID (Democratic Republic of the Congo).

Box 17
Cofinancing – experience from Indonesia

The Indonesia Integrated Participatory Development and Management of the Irrigation Sector Project, approved in December 2015 by the IFAD Board, is the **largest-ever project cofinanced by IFAD, at a total project cost of US$828 million**. The project design was innovative insofar as it built on the past experiences of the Asian Development Bank (ADB) and IFAD and knowledge generated in Indonesia to strengthen the links between agriculture (IFAD's main intervention area) and the rehabilitation of irrigation systems (ADB's main intervention area, including hard and soft elements). IFAD provided US$100 million, consisting of a loan for US$98 million (third-party financed through KfW) and a grant for US$1.5 million. The ADB provided US$600 million. The Government's contribution at appraisal was estimated at US$128 million. The main obstacles for effective implementation were the institutional partnership arrangements. IFAD and the ADB dealt with two different ministries (Ministry of Public Works and Housing, and Ministry of Agriculture). The synchronization of activities in terms of time and locations did not work out well although a basic agreement on 750 schemes existed. All this led to delays in disbursements. IFAD staff in Jakarta have drawn three lessons from the experience to date: (i) the need for a stronger practical and flexible partnership approach for cofinancing; (ii) IFAD should have some hard infrastructure itself and not just rely on cofinancing partners; and (iii) timing is key – if there is cooperation in a project of this kind, infrastructure rehabilitation needs to start in year 1, and agriculture services should not come in before year 4 (depending on the pace of rehabilitation).

Sources*:* Interviews with IFAD and ADB country staff and Government officials in Jakarta; Integrated Participatory Development and Management of the Irrigation Sector Project Supervision Report 2018.

175. Partnerships with a broader range of government agencies have created opportunities for infrastructure investments, but also led to higher transaction costs. For Indonesia, the 2014 CSPE noted the high transaction costs resulting from interacting with so many government counterparts.[59] Diverse partnerships with a large number of implementing partners were also noted for Philippines (2017 CSPE) and Sri Lanka (2019 CSPE), where a dozen ministries or departments were been involved in implementing the post-tsunami projects.

176. Egypt is a notable exception within this group of Top Ten infrastructure countries. In Egypt, infrastructure remained a focus despite the almost exclusive partnership with the Ministry of Agriculture and Land Reclamation.[60] The Egypt CSPE (2017) noted this rather narrow partnership as the main factor limiting the effectiveness of IFAD's investments in on-field irrigation and WUA capacity-building. In Egypt, the lack of wider partnership opportunities was clearly limiting the opportunities for IFAD to expand and scale up its investments into (soft) infrastructure. The CSPE also noted the absence of a meaningful policy engagement with regard to WUAs.

Government partner performance in project sample

177. **Lead agencies in project sample.** The ministry of agriculture (MOA) was the most prominent implementing partner in the project sample, leading a total of 19 projects (see table 9). Six projects were led by local governments and 10 were under other ministries. The majority of CDD projects included in the sample were led by local governments (four projects). MOAs have led the majority of projects classified as "community-based" and "production and market."

[59] In Indonesia, IFAD worked as a partner with several government agencies and a wide range of counterparts in different government ministries and at various levels of government (central, provincial, district and even subdistrict). This included the Ministries of Agriculture, Marine Affairs and Fisheries, Home Affairs, Foreign Affairs, Finance, and Planning.
[60] The Ministry of Water Resources and Irrigation has been added in recent years (since 2012), and mainly through the joint-donor-funded platform for on-farm irrigation development.

Table 9
Lead agencies in project sample across project types

	Community-driven development	*Community-based*	*Production and markets*	*Infrastructure-heavy*
Ministry of agriculture	2	7	8	2
Local government	4	0	1	1
Other ministries	1	4	3	2

Notes: Ministry of Agriculture: 19 projects (average domestic cofinancing: 34 per cent); Local government: 6 projects. (average domestic cofinancing: 19 per cent); Other ministries: 10 projects (average domestic cofinancing: 25 per cent). Source: ESR analysis.

178. **Government cofinancing (sample projects).** MOA-led projects had higher than average domestic cofinancing (34 per cent), while those led by local government had lower than average domestic cofinancing (19 per cent). Relatively few infrastructure activities were cofinanced by governments. They were mainly for roads and irrigation but also social, NRM and livestock infrastructure investments. Particularly high domestic government cost sharing (> 50 per cent) was found for irrigation in Azerbaijan (#2) and Mauritania (#12), livestock in Turkey (#20), transport in Rwanda (#17), energy in China (#26), and social in Democratic Republic of the Congo (#6) and Nigeria (#15).

179. **Institutional arrangements for implementation.** Management of infrastructure subcomponents has usually been delegated to local PMUs and/or sector departments. For example, in Sri Lanka, these were the Provincial Irrigation Departments (in the case of the Iranamadu Irrigation Development Project) or Department of Agrarian Development (in the case of the Dry Zone Livelihood Support and Partnership Programme).

180. The institutional arrangements required for the implementation of infrastructure subprojects were complex and required a certain degree of coordination and oversight. This is where projects often underperformed. In the National Agricultural Land and Water Management Development Project (The Gambia), the project support unit did not clarify the roles and responsibilities of the design team, the supervising engineers, and the construction company in charge of implementing the civil work. As a result, there were no design plans, equipment or construction management forms at the construction site, and the supervising engineer present was not aware of the details of the project under construction. The technical specifications were vague.

181. Projects that included a number of different infrastructure activities required more complex implementation arrangements. For example, in China (Guangxi Integrated Agricultural Development Project), the provincial project management office played the key role in the management of project implementation. It took overall responsibility of the project planning, coordination, management and guidance to the lower levels. The county project management offices mainly focused on planning, coordinating, M&E, and reporting of the project. Implementation of project activities remained with the designated implementing agencies.[61] A similar arrangement was found in Lao People's Democratic Republic (#9), where at central level, the Department of International Cooperation of the Ministry of Planning and Investment was the contact point for coordination with IFAD. The project was jointly implemented by planning offices and five line agencies at provincial and district levels.

182. **Implementation capacities.** Capacities for implementation were often noted as insufficient. The complexities and novelties of infrastructure design and participatory processes with high capacity requirements reportedly slowed start-up and delivery.

[61] Implementing agencies included the Bureau of Water Resources, Bureau of Transportation, Bureau of Agriculture, Bureau of Livestock, and rural energy offices.

They were related to the number of different infrastructure components in some projects, such as Rwanda (#29), unfamiliarity of PMUs with specific infrastructure categories, particularly markets, as in Kenya (#8), Malawi (#38) and Viet Nam (#35), and general weaknesses in project infrastructure design (Sri Lanka [#32]). This led to unplanned and sometimes lengthy design and feasibility studies during implementation.[62]

183. Projects often relied on local consultant companies, for example, for the preparation of design documents. Moreover, the detailed specification for infrastructure projects was usually done by local consulting companies. In some cases, independent engineering consultant groups were engaged for technical auditing of designs, bills of quantities and engineer's cost estimates, and construction. This proved very effective in enhancing diligence and cost-effectiveness of designs and quality of the works. In the Iranamadu Irrigation Development Project (Sri Lanka [#48]), the Provincial Irrigation Department did not hire an external consultant to supervise the works of the rehabilitation works contracts as proposed originally. The rehabilitation works include a large number of small canal structures that are geographically scattered within large areas of the irrigation system. Works on those structures have to be carried out concurrently and require a large number of supervisory technical staff on site at any given time. The CSPE found the staffing and resources available for quality assurance of the works inadequate for the large volume of works executed during a five-year implementation period. This may have somewhat compromised the quality assurance of the works.

184. Local capacities for construction contract work by service providers were often low, as was PMU capacity to procure and supervise such work, which often takes place in distant target areas.[63] These deficiencies were partly dealt with at later project stages through recruiting technical assistance. National procurement norms were sometimes not well adapted to the complexity of the infrastructure tasks (Mozambique [#36]), and procurement manuals were inadequate and had to be established first before work could start (Lao People's Democratic Republic [#9]). Some projects encountered more generic administrative problems that caused delays for infrastructure, such as the late provision of IFAD funds due to lengthy withdrawal applications (Mozambique [#36] and Pakistan [#16]).

185. PMUs often did not have the required expertise to oversee the infrastructure subprojects. In the National Agricultural Land and Water Management Development Project (The Gambia), the absence of irrigation and rural infrastructure engineering expertise within the project support unit negatively affected the quality of work and the sustainability of infrastructures. The project relies mainly on the Soil and Water Management Services of the MOA and contracted supervising engineering companies to design and review the infrastructure works under this subcomponent.

186. **Performance of implementing partners.** Projects led by MOAs scored higher on gender and targeting criteria.[64] Women were targeted well in the MOA-led projects in Madagascar (#11), Rwanda (#17), Sudan (#18) and Turkey (#20). The very poor were well targeted by the MOA-led projects in Rwanda (#17) and Turkey (#20). However, the combined effectiveness criteria (achievement of outputs, and technical quality) were best achieved by ministries other than MOAs or local government.[65] The two projects in Lao People's Democratic Republic (#9) and China (#26) had similar implementation arrangements involving different line agencies, and they were noted for their good infrastructure quality. The performance of local

[62] Noted for Kenya (#8), Nepal (#27), Sri Lanka (#32) and Tunisia (#33).
[63] Democratic Republic of the Congo (#6), Lao People's Democratic Republic (#8), Mauritania (#12), Morocco (#14) and Mozambique (#36).
[64] Altogether, six projects scored satisfactory on the targeting criteria (gender and pro-poor). These included four under MOAs: Madagascar (#11), Nigeria (#15), Rwanda (#17) and Turkey (#20).
[65] For example, in China (#26), Lao People's Democratic Republic (#8) and Pakistan (#28),

governments was assessed positively only in Viet Nam (#35).[66] Projects implemented by local governments were noted for their weak sustainability in several cases, for example, in Cambodia (#24) and Sri Lanka (#32).

187. **Institutional and policy issues.** Studies highlight the extent to which the performance of infrastructure is hampered by institutional issues related to decentralization of services within the sector (see box 18). Shortcomings with regard to implementation and coordination capacities and the insufficient involvement (and capacity) of private sector service providers and water users have been highlighted in the case studies above. They need to be seen against the background of the more systemic issues affecting performance in the infrastructure sector. The case studies highlighted IFAD's limited attention to and engagement on policy issues in relation to infrastructure, such as irrigation and roads.

Box 18
Reform of irrigation sector in Georgia

Georgia has a complex history of institutional change in the irrigation and drainage sector. Primary irrigation and drainage canals and most secondary canals (off-farm systems) were owned and managed by the Department for Amelioration Scheme Management until 2006, when the Government of Georgia replaced it with four regional state-owned limited liability companies (LLCs). Attempts to privatize these LLCs started in 2010, but did not attract enough interest. In March 2012, these four regional companies were merged into a single state-owned entity called the United Amelioration Service Company for Georgia. In 2015, this entity was renamed to Georgian Amelioration LLC, and it is currently responsible for irrigation infrastructure management in Georgia.

Source: ESR case study (2020).

B. International cofinancing

188. Cofinancing partnerships have played a pivotal role in IFAD's investments in infrastructure, but they have come with their own challenges. While many of these partnerships were built on complementarities, as anticipated in IFAD's strategies, they were often difficult to implement at operational level.

International partnerships and cofinancing in project sample

189. The 35 sampled projects had internationally cofinanced infrastructure activities in 18, or about half, of them, with OFID being the partner of choice in 8 projects, the World Food Programme (WFP) in 6, IFIs in 3 (ADB, AfDB and GEF), and other, mainly bilateral partners, in 7 projects. Three projects had more than one cofinancier. Most international cofinancing was found for roads and irrigation, and some for market access, social and soil and land management.

190. Overall, the evaluations contained little information on the integration of project activities with cofinanciers to achieve better design, safeguards, results and scaling up. One impression from the qualitative review was that cofinancing for infrastructure is difficult to synchronize and often siloed, something that also was confirmed by the e-survey and the case studies (see below). Joint supervision is not well described in the documents. In a few cases, cofinanciers pulled out of projects, mostly for reasons of poor disbursements or general project performance (Democratic Republic of the Congo [#6] and Morocco [#14]).

191. **Performance by international cofinanciers.** For OFID, as the cofinancier with the largest number of cofinanced projects and relative high infrastructure investment contributions overall, positive infrastructure outcomes were found in half of the projects: in Armenia (#1, energy), Burkina Faso (#22, sustainable land management), Tunisia (#33, mainly roads) and Turkey (#20, markets). However, OFID-cofinanced infrastructure activity outputs did not work out satisfactorily in

[66] Projects under local government overachieved their targets in Lao People's Democratic Republic (#10), Mozambique (#38) and Pakistan (#28). The poor quality of infrastructure was noted, for example, for Malawi (#38), Nepal (#27) and Sri Lanka (#32), all led by ministries of local government.

Burkina Faso (#23, irrigation), Malawi (#38, markets/transport), Mauritania (#12, roads) and Rwanda (#29, roads/drinking water), partly due to overall poor project performance. In some projects where outputs were satisfactory, OFID-financed infrastructure was not well targeted to IFAD target groups (Armenia [#1] and Tunisia [#33]), but then these two projects were not well targeted overall.

192. WFP cofinanced projects in six countries with mostly positive outcomes, except for some problems in Cambodia (#24). WFP contributions were comparatively small in size, limited to food and cash for work, and half of them were for roads. GEF fared well on soil and land management infrastructure in Burkina Faso (#22) and Tunisia (#34). The number of bilateral cofinanciers was relatively large (eight), but their contributions tended to be small (except for Agence Française de Développement (AFD) in Tunisia [#34], and Japan in Sri Lanka [#30], where they reached about 10-15 per cent of total) and with mixed results, largely depending on overall project performance.

193. The ADB, AfDB and the European Union cofinanced one project each in this sample, all of which performed satisfactorily. In Pakistan (#16), the ADB had the lead and supervising function for IFAD in a project that covered multiple infrastructure subsectors and was mostly implemented in the 2000s. More recently, the AfDB provided significant cofinancing with IFAD in United Republic of Tanzania (#19), a market-oriented project that performed quite well. This project took a sector-wide approach to improving post-harvest and market access, also involving other parallel financiers. In Madagascar (#11), the European Union was scheduled to contribute about one quarter of donor funds to IFAD's successful production and market access project, but funds were delayed for political reasons (a coup in 2009).

194. **Performance of cofinanced versus non-cofinanced infrastructure activities.** For the 35 sample projects, the ESR conducted a quantitative analysis of the frequency of scores for infrastructure performance compared with infrastructure exclusively relying on loans and grants from IFAD except for the usual government and beneficiary contributions. Some differences were found, but they should be interpreted with caution as some underlying numbers are not very large.[67] The analysis suggests that project cofinancing as such makes some, but relatively weak, differences in the performance of infrastructure activities (see table A4.8.).

195. **UNOPS** provided (partial) implementation and supervision services to 7 of the 35 infrastructure projects that were reviewed qualitatively. Projects supervised by UNOPS performed well on technical quality, pro-poor targeting, and gender.

196. In Democratic Republic of the Congo (#6), the main infrastructure works were implemented by UNOPS. In Lao People's Democratic Republic (#9), the supervision and implementation support to the project in the first four years was deemed to be good, with a smooth handover to direct supervision by IFAD. UNOPS project supervision was also done satisfactorily in Mauritania (#13) and United Republic of Tanzania (#19) until IFAD took over. In a second project in Mauritania (#12), UNOPS supervision was reportedly executed in accordance with the scheduled timeline.

197. In contrast, in Pakistan (#16), the limited frequency and follow-up by UNOPS supervision (one mission per year) during the first implementation year was described as constraining project delivery improvement. In Rwanda (#29), UNOPS supervision missions were generally appreciated by the project coordination units, with good performance in loan administration and fiduciary aspects, but procurement reviews were in some instances not timely. UNOPS performance was generally characterized by limited involvement and ownership, and by repeated delays in dealing with withdrawal applications and no-objection requirements.

[67] For details, see tables A4.9. and A4.10.

Challenges in cofinancing partnerships

198. The e-survey produced some useful open-ended answers on problems and opportunities in IFAD-cofinanced projects[68] that also were analysed in the case studies. Comments and observations covered three topics: (i) the timing and synchronization of activities by cofinanciers; (ii) the question of how safeguards are handled; and (iii) the consequences of IFAD being a junior partner in cofinanced projects, as sometimes happens (see box 19).

Box 19
E-survey responses on cofinancing

Timing and synchronization. The largest number of comments refer to complications of cofinanced projects in planning, coordinating and synchronizing activities, in timing the flow of funds, and in dealing with each institution's own administrative procedures **(n=45+ responses counted)**.

Safeguards. Several respondents noted some problems concerning safeguards in cofinanced projects **(n=7+)**. Safeguards sometimes differ for cofinanciers, and then it is not always clear which ones to follow. Quote: "No clear common approach on what is acceptable to both parties – which safeguards would apply to the infrastructure, how the gaps in meeting both IFAD and cofinanciers safeguards requirements will be met, and roles and responsibilities." IFAD may also be held accountable for cofinanciers' safeguards that sometimes are more stringent than IFAD's safeguards.

IFAD as a junior partner. "When IFAD is too small in relation to the cofinancing partner, IFAD's priorities may not carry through as well as they should." Several respondents see a dilemma when IFAD is the junior partner in cofinanced infrastructure projects (n=5+). On the one hand, IFAD has too few resources to meaningfully carry out major public infrastructure projects on its own; on the other, IFAD may find itself in a junior position with cofinanciers where it does not have sufficient influence and control over the project to pursue its own objectives ("we lose control over outcomes"). In this context, a number of respondents were specifically concerned about beneficiary participation and benefits (n=5+). IFAD beneficiaries and specific objectives were not always reached and achieved in cofinanced projects, as partners may not have had the same focus. Quote: "The size and number of experts in IFAD make it difficult to be more proactive in agenda setting, not enough engagement at heads of agency level reduces IFAD's influence and share of the portfolio, greater efficiency and systems in place internally to manage cofinancing would increase efficiency and ability to report."

Source: ESR e-survey (2020).

199. **Synchronization and coordination.** The main problems encountered in cofinanced projects are the need to clarify mutual expectations with cofinanciers from the start, and the clarity of roles, responsibilities and (donor) leadership in cofinanced projects. This may require a long time for advance planning. A major point raised by several respondents was that, in principle, IFAD investments for soft infrastructure should precede cofinancing of hard infrastructure. However, in design, too much attention is often paid to starting construction, in part because cofinanciers may have shorter project durations (such as OFID).

200. Reconciling different donor cycles, the alignment of timing of funding, and delayed cofinancing pose another common problem according to many respondents. This is compounded by different policies, procurement and administrative rules for procurement and financial management, which can lead to complexity and delays. Cofinanciers have their own administrative culture. Joint supervisions are often difficult to organize, and if they happen, supervision teams may be too large and focus on too many internal administrative issues to allow for meaningful debates of substance, beneficiary interactions, and participation. Last, different monitoring and reporting requirements may lead to difficulties in IFAD monitoring and capturing the overall project results, including those achieved through cofinancing.

[68] In the e-survey, the question was: "What is working well, and not so well, in IFAD's cofinancing partnership?"

201. The case studies illustrate the challenges in synchronizing cofinanced activities within the same project. In the case of Burundi (#42), the late release of the OFID and WFP funds led to serious delays in implementation of cofinanced activities. In the case of Madagascar (#47), the European Union and the United States Millennium Challenge Corporation withdrew (and UNDP provided only half of the planned amount) due to political developments (a coup in 2009). In the case of Chad (#45), both AFD and the Swiss Agency for Development and Cooperation withdrew from the project, with IFAD having to reallocate some of the funds.

202. Parallel funding of related projects provided its own challenges even when managed by the same government units. In The Gambia (#46), loans and grants from the Islamic Development Bank and the AfDB run in parallel with the IFAD-supported project, but synergies between the interventions of the three donors remained weak and spread over different sites (MTR).[69] In the case of Georgia (#44), the project has been affected by the lack of functioning WUAs, which are under the mandate of the World Bank's Irrigation and Land Market Development Project. Parallel cofinancing seems to have worked well in Bangladesh (#40), where IFAD's component focused on union and village roads and bridges, and on community and village markets; the ADB component financed larger-scale *upazila* roads, large markets and growth centres; and KfW provided support for cyclone shelters and other climate-resilience needs.

[69] The Islamic Development Bank also suspended its financing for about two years (from mid-2015 to mid-2017). This was because of the Government's request to allocate 87 per cent of the budget to procure heavy equipment and machinery.

Key points (chapter IV)

- **Government partners.** In countries where IFAD-supported programmes included high shares of infrastructure investments, partnerships with specialized line ministries or agencies drove those investments. However, engagement with a large number of partners also increased the transaction costs for IFAD in these countries.
- Within the project sample, MOAs were the predominant partner. Management of infrastructure subcomponents was usually delegated to local PMUs and/or sector departments.
- The institutional arrangements required for the implementation of infrastructure subprojects were complex and required a certain degree of coordination and oversight. This was often where projects underperformed. Projects that included a number of different infrastructure activities required even more complex implementation arrangements.
- Capacities for implementation were often insufficient. The complexities and novelties of infrastructure design and participatory processes with high capacity requirements reportedly slowed start-up and delivery. Local capacities for construction contract work by service providers were often low, as was PMU capacity to procure and supervise such work.
- The analysis of performance by lead agencies indicates some trade-offs between the effectiveness of infrastructure provision and the focus on social inclusion. The combined effectiveness criteria (achievement of outputs, and technical quality) were best achieved by ministries other than MOAs or local government. Projects led by MOAs scored higher on gender and targeting criteria. Sustainability was weakest for projects implemented by local governments.
- **Cofinancing partnerships.** Partnerships with the ADB drove cofinancing on infrastructure in several of the Top Ten infrastructure investment countries (Afghanistan, Bangladesh, Cambodia, Philippines and Sri Lanka).
- The review of CSPEs showed that these cofinancing partnerships were critically important for increasing IFAD's support to infrastructure, and they were found in every single case in the Top Ten infrastructure countries.
- Comments from the e-survey refer to challenges of cofinanced projects to plan, coordinate and synchronize activities, to time the flow of funds, and to deal with each institution's own administrative procedures. Parallel funding of related projects provided its own challenges even when managed by the same government units. Safeguards sometimes differed for cofinanciers, and then it was not always clear which ones were to be followed. Respondents see a dilemma when IFAD is the junior partner in cofinanced infrastructure projects.

V. Findings on rural poverty and gender impact

A. Infrastructure linkages with poverty reduction

203. **Direct and indirect impacts.** Studies have shown that infrastructure linkages with poverty reduction are direct and indirect, and that they are mutually reinforcing. Increased agricultural productivity may have a positive impact on food availability and nutrition. Access to water and easy access to health facilities, through improved roads and transportation, help reduce mortalities. School enrolment is also enhanced by better transportation (UNDP, 2005).

204. Investments into soil and water management, livestock shelters, storage and others help to increase productivity. Indirectly, productivity can also be raised through investments in social infrastructure, with the goal of improving living standards in poor rural areas. For example, more efficient and affordable basic household services – water and sanitation, household electricity, access to affordable health care, basic education, and public transport services – may improve the productivity of farm workers and managers (FAO, 2008). Construction of market facilities and roads directly improve connectivity and market access. In this way infrastructure enhances agricultural productivity, reduces transportation costs and may also generate more jobs.

205. A UNDP report (2005) emphasizes the importance of the soft elements of economic infrastructure (termed "infrastructure services") that are particularly important for O&M, and that are seen as particularly relevant for poverty reduction. Capacity development and governance are necessary in order for infrastructure projects to be beneficial to poverty reduction.

206. **The RIA studies** found that projects with a strong theory of change exhibit stronger impacts. Projects that are focused and consist of interlinked activities and objectives can generate larger impacts than projects with more diversified or unlinked interventions. Infrastructure-based interventions have been found to generate positive impacts. However, impacts are maximized when infrastructure interventions are combined with marketing activities (as in the case of the Guangxi Integrated Agricultural Development Project in China). Value chain projects can be very effective, and the impacts can be even greater when combined with support for market access, agroprocessing and rural finance. The analyses show that projects implementing agricultural production and marketing activities along with infrastructure activities may lead to stronger production and economic mobility impacts.

207. Projects with diverse and unlinked activities were found to have less impact. This could be explained with the potential dilution of project impacts resulting from the high heterogeneity and small scale of interventions across project areas. These are, for example, some of the CDD projects, which often address the most-pressing and immediate needs as expressed by the communities. However, the approach often translates into clustering needs around similar thematic areas within which stronger impacts could be found (IFAD, 2019).

208. The detailed findings from the RIA studies (see box 20) are reflected in the case studies presented in the sections below.

Box 20
Lessons from studies by the Research and Impact Assessment Division of IFAD-supported projects with infrastructure components

- Improved communal irrigation systems have potential to increase rice yields.
- Communal irrigation system management can improve significantly with sufficient training.
- Building in ex ante measures to manage risk of extreme events (weather or other natural hazards) is crucial, especially in highly vulnerable regions.
- Irrigation is transformative, making farmers resilient to climatic shocks. It acts as a risk management strategy by increasing well-being and building resilience.
- To maximize high-value crop production, irrigation needs to be bundled with marketing and market access activities.
- Impact will be greater if infrastructure is combined with marketing- and/or production-oriented activities.
- An integrated approach covering both production and marketing aspects can specifically target those at the lower end of the income distribution.
- Group membership increased in all where management training for maintenance was at group level.
- Infrastructure benefits may accumulate over time through multiplier and long-run effects, or decline after a large initial impact for different reasons.

Source: RIA presentation during ESR FGD.

209. **Sample performance on rural poverty impact**. For an assessment of project-level poverty impact, the ESR referred to IOE ratings. Within the sample of 35 projects, 9 had received a "satisfactory (5)" IOE rating on poverty impact,[70] while 6 had received "unsatisfactory" ratings.[71] The remaining 19 projects were rated "moderately satisfactory (4)."

210. Notably, projects with a strong focus on agricultural productivity *and* markets had received higher ratings on poverty impact. Irrigation, livestock and fishery, marketplaces and transport were the most frequent infrastructure activities in these projects rated 5 on poverty impact.[72] This observation is in line with RIA findings that infrastructure bundled with production and marketing support yields better results, a finding that is also supported by the case studies.[73]

211. Two production and markets focused projects in the sample also received unsatisfactory ratings on poverty impact. The main issue there was that infrastructure activities were not sufficiently linked to achieve a notable poverty impact.

B. Rural poverty impact in case studies

212. **Agricultural productivity and incomes.** The case studies confirmed that improved community infrastructure for irrigation and market access (particularly roads) led to an increase in the productive capacity (see box 21), to extended irrigated lands and, ultimately, higher incomes in China (#41), Madagascar (#47) and Philippines (#49). In Sri Lanka (#48), the combined effort of small-scale irrigation rehabilitation and interventions to increase soil productivity contributed to expanded cultivated land and productivity. In Burundi (#42), better swampland, irrigation and watershed infrastructure, combined with socio-economic community infrastructure and better access to improved seeds and fertilizers, helped self-sustaining rural households.

[70] #1, #2, #3, #17, #19, #33, #26, #35 and #36.
[71] This included 4 "moderately satisfactory (3)" projects (#7, #25, #27 and #38) and 2 "unsatisfactory (2)" projects (#15 and #23).
[72] Armenia (#1), Azerbaijan (#2), Bhutan (#3), Mozambique (#36) and United Republic of Tanzania (#19).
[73] RIA presentation shared during ESR FGD.

Production and incomes improved, but less than expected due to lack of equipment and management problems.

213. **Food security.** Where incomes increased, this did not always translate into reduced levels of poverty and better food security, especially undernourishment. For example, in Sri Lanka (#48), the expectation was that higher agricultural productivity and production would improve availability of food and cash incomes. In the cases of China (#41) and Madagascar (#47), some improvement in food security and assets was noted, but this had only marginal impact on undernourishment. In Philippines (#49), only 7 per cent of the poor managed to move above the poverty line of US$1.90 a day (RIA).

214. **Social infrastructure** contributed to improved livelihoods through safe water supply and sanitation, community health centres, schools and libraries, and household biogas units, digesters, and eco-stoves.[74] Brazil (#43) invested a substantial part of its Social and Cultural Investment Fund in social infrastructure. In this project, improved community water supply was linked to better-performing productive backyards (and, hence, food security), as well as better health outcomes, indirectly affecting households' ability to work and provide for their incomes. Energy infrastructure (at community and household level) was also linked to better-performing backyards.

215. These examples demonstrate complementarities between productive and social infrastructure in community-led projects. A similar overlap was found in Chad (#45), where pastoral wells were also used for domestic purposes.[75] Pastoral hydroinfrastructure (e.g. boreholes and livestock drinking water) led to higher livestock productivity and declining herd losses, with newly accessible pasture lands, more water points and safe transhumant corridors, with positive impact on livelihoods. Brazil (#43) also supported, inter alia, water reservoirs for animals, which contributed to improved livelihoods.

216. **Market infrastructure.** Improved market access through better roads and marketplaces increased sales and incomes, but not necessarily for the poorest or those furthest away (#40, #47 and #48).[76] The rehabilitated roads led to improved access to agricultural markets and sales because they were combined with productivity and pro-poor measures, contributing to more equitable increases in incomes in the case of China (#41).

Box 21
Lessons on poverty impact of infrastructure from the Top Ten case studies

Pro-poor results (e.g. food security for the poorest) do not necessarily follow from increases in income, and do not imply that. For community development projects, to ensure that improved self-sufficiency matures into increased incomes, more emphasis is needed on boosting income-generating activities and small enterprise formation.

For market access projects, agricultural productivity does not necessarily increase with improved access to output markets. Further support should be provided to improve agricultural productivity and encourage crop diversification. This can be achieved by providing farmers with training, improved technology, and better access to and more-affordable inputs.

Barriers to women's empowerment need to be thoroughly analysed and addressed, with an attention to measures to free their worktime. Access to safe water and sanitation

[74] Arguably, this helped households to have better access to sustainable agricultural practices and to improve their livelihoods, for instance, through better health outcomes (Brazil [#43], Burundi [#42], China [#41] and Madagascar [#47]).
[75] However, the same project (#45) is also a case where the component on social services was not well aligned with the other two components, with limited impact (PE, paras. 85 and 106, p. 26).
[76] Owing to improved market access, farmers in Bangladesh (#40) were 11 per cent more likely to sell at markets than at farm gate, sold 5 per cent more of their harvest, and were 8 per cent more likely to cultivate high-value crops, leading to increases in household income of 11 per cent. These impacts were less pronounced for the farmers too far from the markets and for the poorer ones, with the missing link to livelihoods building as a potential factor.

is a basic need and priority for many women. Women can be better reached with the right partners.

User groups in charge of infrastructure O&M need sufficient training and capacity-building, as well as clear rules of operation, ownership and member bases, with clear identification of the roles of government (including in terms of financing). Expectations from the user groups with regard to O&M need to be commensurate with their capacity.

The policy and institutional framework also affects the extent to which the poor are able to access infrastructure. Engagement in policies is needed to ensure that the barriers for the project aims are removed, working jointly with the governments, for example, as related to land rights.

Source: ESR case studies.

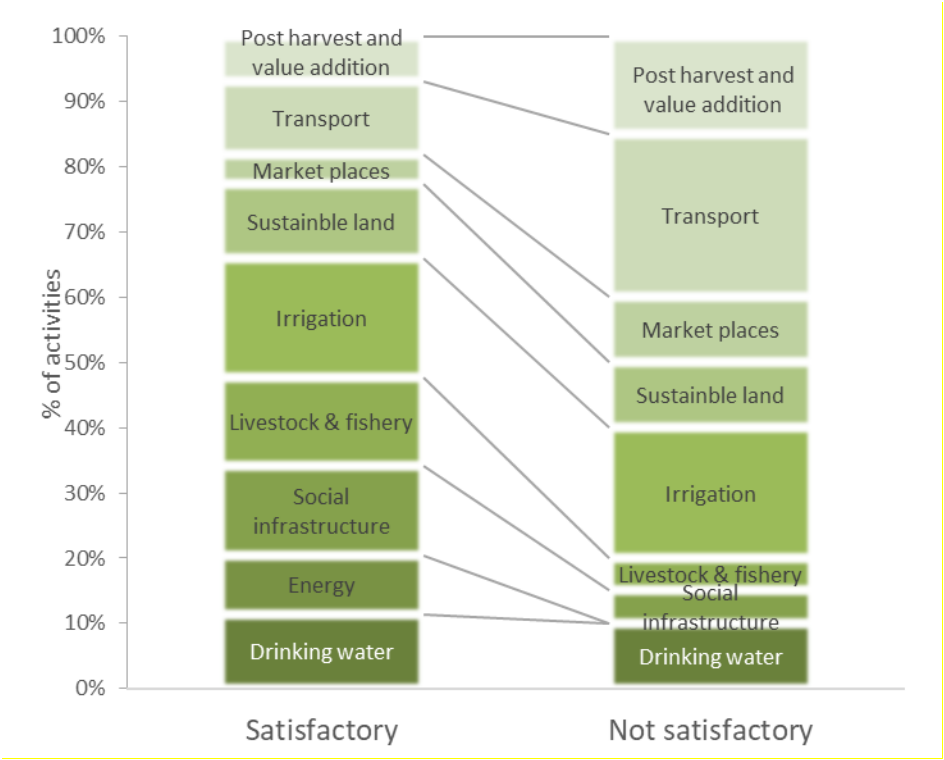
C. Gender equality and women's empowerment

217. **Infrastructure targeting women.** The ESR on gender equality and women's empowerment (IOE, 2017) found that provision of infrastructure can address some root causes of gender inequality, such as time poverty, and that it can galvanize group action to also empower women. The study identified infrastructure that simultaneously provides conditions for economic growth and reduces women's time burden as important. For example, the construction of roads decreased the time needed for children to reach school and for household members to reach health services, and improved access to markets and employment (e.g. in Bhutan). Similar impacts were found through the construction of bore wells and water storage tanks (e.g. in Ghana and Kenya). Technological improvements typically have gender dimensions. They can have transformative potential for women, as they can help to simultaneously enhance women's production and reduce their time burden. Freeing up women's time allows them to engage in income generation and decision-making (e.g. in India), and can contribute to poverty reduction.

218. **Gender focus in sample projects.** The review of the 35 sample projects in this ESR showed that social infrastructure (education and health), energy, and livestock and fisheries were successful in reaching women (see figure 19). Transport, marketplaces, post-harvest and value addition infrastructure were rated not satisfactory in the majority of cases reviewed. Drinking water and irrigation showed a mixed performance with regard to gender. Women benefited particularly from infrastructure on drinking water and sanitation, energy, literacy and NRM.[77]

[77] For example, in the community-based projects in Lao People's Democratic Republic (#10), Nepal (#27) and Viet Nam (#35).

Figure 19
Evaluation synthesis report scores on gender by activities



Source: ESR analysis of review sample (35 projects).

219. **Special measures to reach out to women.** The case studies draw attention to special measures that are needed to facilitate women's representation in infrastructure projects. In Burundi (#42), the engagement of NGOs helped to correctly identify the target group – farmers – and also include women-headed and doubly orphaned households managed by children. Community-based projects performed particularly well on engaging women throughout all the different infrastructure activities.[78]

220. Projects that had made very few provisions for women and largely failed to engage them were those in value chains and in specialized infrastructure projects.[79] Choosing the existing organized groups of producers led to the exclusion of some potential beneficiaries in The Gambia (#46). In Mozambique (#36), the drinking water, literacy and housing infrastructure activities showed very disappointing engagement and results for women. In Malawi (#38), women were not benefiting much from post-harvest activities.

221. **Access to water.** Provision of drinking water is a priority for many women. Women and girls are responsible for fetching water in four out of five households where a drinking water source is off premises (World Health Organization, 2019). Many IFAD-supported projects include the provision of water, as drinking water, for livestock or for irrigation. However, the extent to which women are able to benefit from access to water varies. The most obvious benefit, which is consistently noted in evaluation, is related to the time-savings resulting from the greater proximity of water sources (see below). The often-insufficient quality of drinking water in community-operated facilities limits those benefits.

222. For example, the recent PPE of the Khatlon Livelihoods Support Project in Tajikistan (2020) found that the quality of drinking water facilities was poor and often did not meet the standards for safe and clean water. Moreover, the facilities primarily

[78] In Cambodia (#24), Madagascar (#11), Pakistan (#16) and Rwanda (#17).
[79] For example, in Sri Lanka (#32), Tunisia (#33), and Turkey (#37).

designed and built for drinking water supply systems were often also used for irrigation and livestock as well. As a result, hygiene standards were low and the water often not sufficient to meet all those demands.

223. Where access to water has improved, women also require additional activities to realize the full economic benefits. For example, Brazil (#43) led to greater capacity to meet households' water needs for household consumption, produce more with less land, produce staples for household consumption, and improve dietary diversity. However, only those beneficiaries who also participated in other activities, beyond the provision of a cistern, experienced significant gains in total cultivation value (IFAD, 2019f).

224. Women's benefits are also limited due to their insufficient participation in WUAs. The ESR on water (2014) cites, as one of the causes for lower participation of women in WUAs, the fact that the issue of multiple uses of water is not adequately addressed by these bodies. Women have clear preferences about how an irrigation system should be operated – irrigation operations and scheduling of water deliveries – constrained as they are by home workload, childcare responsibilities and security reasons. Not addressing these concerns effectively disincentivizes them from actively participating in WUA functioning even when representation is statutorily mandated.

225. **Access to energy.** Energy has received less attention in IFAD, but it has the potential to yield significant benefits, as the review shows. Eight of the 35 projects implemented energy infrastructure activities. Four of these had primarily positive impacts for women, while, for the remaining four projects, the information available regarding gender-specific project outcomes was not specific to energy infrastructure.[80] Women were actively involved in the planning and construction of the biogas systems, and utilization of this technology was closely related with a reduction in women's workloads.

226. **Access to marketplaces.** Marketplaces may exclude women, unless specific measures are taken. In Bangladesh (#40), the PPE (2020) found that the project had only minimal effects on the multiple barriers to women's equal participation in rural markets because the benefits of infrastructure development were largely channelled towards men, as the main users of markets and roads. The ESR on gender cites another project from Bangladesh as a good practice, creating safe spaces for women in markets (see box 22).

Box 22
Bangladesh: Market Infrastructure Development Project in Charland Regions

In the Market Infrastructure Development Project in Charland Regions, safe spaces in the markets for women, and their representation in market management committees enabled more women to trade in market areas and encouraged more women buyers to visit these markets. Women report feeling safe going to the market because the markets are cleaner, better organized and better connected to surrounding villages (after road construction). The volume of trade in markets and trader income are reported to have increased (although data are not disaggregated between men and women). The increased income has been used to improve housing, purchase assets, and improve food security. Overall, the increased income and improved job opportunities from all project market development interventions have changed women's status. Decisions in the households, for instance, on purchasing food or cleaning products, are now made jointly. In some communities, women participate more than before in community meetings and decision-making.

Source: ESR Gender case study (IFAD IOE, 2017).

227. **Equitable workloads.** There could be potential negative impact from infrastructure on women, particularly in the context of increased labour demand during construction. The 2008 study on rural roads, travel and transport (RTT) (IFAD,

[80] For example, through micro projects on gas storage in Mauritania (#12), biogas in China (#26) and Rwanda (#17) , and water mills in Nepal (#27).

2008a) emphasizes that the system for recruitment and remuneration of women and men in RTT works should introduce gender-sensitive criteria for fairness and transparency to avoid exploitation of women workers. Experiences from a number of countries in sub-Saharan Africa, including United Republic of Tanzania and Zambia, have shown that in RTT works the ratio of women to men is always high where communities are required to contribute unpaid labour as compared to paid works.

228. Not putting extra demands on women's time (e.g. through labour contracts) has played a positive role, e.g. The Gambia (#46). Most case studies mentioned only positive impact from freeing up time that used to be spent on household chores that could be used for training and community activism. In Chad (#45), there was a reduction in the workload, on water and wood fetching, which benefited women (although perhaps better results could have been achieved with a dedicated gender strategy based on solid analysis). Similarly, in Brazil (#43), women's workloads were reduced by facilitating access to basic rural services (with potable water tanks close to their houses and the introduction of eco-efficient stoves and biodigesters).

229. The Gambia (#46) shows how difficult it sometimes is to achieve a reduction in the workload, especially when women are directly addressed with productive infrastructure that actually demands more of their time. Helping women to reduce household chores with basic infrastructure and more disposable income from small backyards can improve food security, as in Brazil (#43). However, poverty reduction is not straightforward, due to factors including the lack of transformative business impact and unequal access to productive capital.

230. **Empowerment.** Even very high levels of women's participation did not ensure their equal representation in high-level management roles in several projects, such as China (#41) and Sri Lanka (#48). Brazil (#43) enhanced women's social empowerment and increased the number of women in leadership positions as well as the respect for them as sources of influence and local authority. The Rural Recovery and Development Programme (Burundi [#42]) had a positive impact on women overall through the emergence of 845 female rural leaders who have become respected personalities in their communities. They play an important role in the management of social conflicts and sensitization of communities about women's rights and equality.

Key points (chapter V)

Rural poverty and gender impact

- **Rural poverty impact.** The RIA studies found that projects with a strong theory of change exhibit stronger impacts. Projects that are focused and consist of interlinked activities and objectives can generate larger impacts than projects with more diversified or unlinked interventions. Projects with diverse and unlinked activities were found to have less impact.
- The case studies confirmed that improved community infrastructure of irrigation and market access (particularly roads) led to an increase in productive capacity, to extended irrigated lands, and, ultimately, to higher incomes. However, where incomes increased, this did not always translate into reduced levels of poverty and better food security.
- Social infrastructure contributed to improved livelihoods, through safe water supply and sanitation, community health centres, schools and libraries, and household biogas units, digesters and eco-stoves. These examples demonstrate complementarities between productive and social infrastructure in community-led projects.
- The need to combine livelihoods and market activities was also noted for the value chain-oriented projects.
- **Gender impact.** The review of 35 sample showed that social infrastructure (education and health), energy and livestock and fisheries were reaching women in a satisfactory manner. Transport, marketplaces, post-harvest and value addition infrastructure was rated not satisfactory in the majority of cases.
- The case studies draw attention to special measures needed to facilitate women's representation in infrastructure projects. Even very high levels of women's participation did not ensure their equal representation in high-level management roles in several projects.
- Provision of drinking water is a priority for many women. However, the extent to which women are able to benefit from access to water varies. The often-insufficient quality of drinking water facilities in community-operated facilities limits those benefits. Where access to water has improved, women also require additional activities to realize the full economic benefits. Women's benefits are also limited due to their insufficient participation in WUAs.
- Energy has received less attention in IFAD but has the potential to yield significant benefits. Eight of the 35 sample projects implemented energy infrastructure activities; these had primarily positive impacts for women.
- Infrastructure subprojects may have a potentially negative impact on women, especially in the context of increased labour demand during construction. Not putting extra demands on women's time (e.g. through labour contracts) played a positive role in the case studies.

VI. Findings on themes of strategic importance

A. Infrastructure for smallholder market access and value chains

231. Better market integration and commercialization of smallholder agriculture has been a long-term goal for IFAD. Most of the projects analysed in this ESR (portfolio sample and case studies) supported market access of smallholder farmers in different ways, much of it through various infrastructure elements.

232. **Production-only projects.** Several projects included infrastructure for increased commercialization, product diversification and income generation of horticulture and gardening, particularly for women producers. However, many of these projects focused more on production.[81] The little attention to market access was often seen as a missed opportunity, and one of the main reasons why investments into productive infrastructure were ineffective and beneficiary interest and engagement were low.[82]

233. **Market-related infrastructure.** The most common and generally satisfactory market infrastructure was the construction of roads, bridges and other forms of transport to and from markets.[83] These ubiquitous roads were often among the most appreciated and successful investments of IFAD-supported projects.[84] The construction of enhanced marketplaces, stalls, warehouses and other storage facilities accounted for many market infrastructure resources.[85] Some projects were particularly dedicated to improving either marketplaces or storage capacities, such as the Bangladesh Coastal Climate Resilient Infrastructure Project (CCRIP; #40), the Mozambique Sofala fisheries project (#37), investments into Kenya's horticulture (#8), and the market programme in United Republic of Tanzania (#19).[86]

234. **Value chain approaches.** Only a few projects in the sample and case studies took a true value chain approach.[87] There were some exceptions, where the focus was on whole value chains, originating from the goal of enhancing producer linkages with the final demand through markets and traders; and with production being mainly supported through improved supplies of inputs, advisory services, crop protection and veterinary services, and finance.[88]

235. **Livestock and dairy value chains.** Many IFAD-supported market-oriented activities in sample projects and case studies supported livestock production, aggregation and processing for dairy and meat products.[89] Often, this was coupled with production support and input services for fodder, animal housing and veterinary services (see box 23). For most projects, support to livestock producers' organizations and cooperatives was an integral part of their activities. However, the dairy sector is often highly regulated, and it is difficult for producers' groups to raise

[81] For example, fruit and vegetable nurseries in Nepal (#27), micro- and drip-irrigation in Burkina Faso (#23), and watering and fencing in The Gambia (National Agricultural Land and Water Management Development Project case study).
[82] For Armenia (#1), transport infrastructure was necessary but not sufficient for improved marketing, overall project performance and impact. Missing market opportunities and arrangements also affected productivity and efficiency in the Sudan irrigation project (#18).
[83] Significant transport investments were found in 12 out of 15 CDD projects, and in 6 of the 10 case study projects (CCRIP [Bangladesh], GIADP [China], AD2M [Madagascar], AMMAR [Georgia], IIRP [Sri Lanka] and the National Agricultural Land and Water Management Development Project [The Gambia]).
[84] There were also a number of CDD projects that successfully included market access infrastructure, such as livestock slaughter-houses in Mauritania (#12), marketplaces in Viet Nam (#35), various market activities for crops and livestock in Rwanda (#17, KWAMP) and processing facilities in Nigeria (#15).
[85] Village-based product processing was found in Nigeria (#15). In Democratic Republic of the Congo (#6), only 32 out of 200 planned processing units (15 per cent) were handed over to beneficiary groups, with low sustainability.
[86] In other projects, the role of marketplace infrastructure was relatively small but in high demand (Bhutan [#3] and China [#41]).
[87] Defined as broad investments in and support of "a set of enterprises, stakeholders … [and activities] to bring a product from the initial input supply stage, through the various phases of production, to its final market destination" (CPE Value Chains 2019).
[88] Kenya horticulture (#8), Mozambique fisheries (#37), and United Republic of Tanzania marketing (#19).
[89] Azerbaijan (#2), Burundi (#42) Malawi (#38), Rwanda (#17 and #29), Tunisia (#33) and Turkey (#20 and #37).

their stakes in the market. For example, in Malawi (#38), farmers' groups remained relatively weak vis-à-vis the large (private sector) processors and were not able to raise their incomes accordingly. The more successful projects had integrated production/market approaches with a strong focus on institutional capacities of producers' organizations and cooperatives, mostly in situations where the private sector was relatively embryonic.[90]

Box 23
Success and failure of market infrastructure in Turkey's Ardahan-Kars-Artvin project (#37)

Success: "The Ardahan livestock market started functioning in May 2015.* It was the first one of its kind in Turkey and offered innovative features and services. For instance, it provided temporary accommodation for the livestock that could not be sold, saving the owner the cost of transporting each animal back to the village and again to the market the next day. It offered in-house veterinary services to identify animals with illnesses, initiated the practice of disinfecting incoming cattle to prevent the spread of diseases, and offered parking spaces for the vehicles of users."

Failure: "Four milk collection centres were established by AKADP [Ardahan-Kars-Artvin Development Project], yet none were functioning at the time of the mission visit. This was because the project did not recognize the strength of the traditional arrangements that dairy producers had with privately owned milk collectors (*mandiras*). These arrangements enabled suppliers to receive six months of milk provided in advance in cash, and a lower unit sale price. Consequently, the associations that took over the administration of the milk collection in Benliahmet (Kars) and Ardahan could not compete with the existing *mandiras*, and these centres could not become functional."

* In Ardahan, 68 per cent of the households relied on livestock sales for their entire income. Prior to the project, 80 per cent of households in this province used the traditional livestock market. Citing unhygienic conditions, poor facilities for users, and poor management among the main reasons, 93 per cent of the users of the traditional market reported dissatisfaction.
Source: PPE (2020).

236. **Engaging the private sector.** IFAD has been recognizing the importance of engaging the private sector (see box 24) for better resourcing, management and sustainability of market and other infrastructure since its first Strategy on Private Sector Development and Partnership in 2005 (IOE ESR 2011 on the subject). IFAD's most recent strategy sees the two important roles for the private sector in crowding in private finance, and for IFAD to advocate for and develop inclusive value chains with private sector partners, preferably in 4Ps. IFAD has also reviewed institutional and 4P implementation arrangements in a number of publications since 2015 and developed valuable propositions for implementation approaches (IFAD, 2015). However, the ESR found only a few cases in the infrastructure portfolio sample where projects successfully managed to engage the private sector as a partner and cofinancier in market operations for market access for smallholder farmers. This is partly due to the fact that most of the reviewed projects were designed, implemented and evaluated before the expansion of private sector instruments and 4P project arrangements at IFAD.

237. One of the notable exceptions was the Dry Zone Livelihood Support and Partnership Programme (Sri Lanka [#30]), which established strong linkages between buyers and producers through public-private-partnership marketing infrastructure. The project mainly cofinanced the establishment and collection of processing centres (e.g. milk, fruits and vegetables) with private and public companies (Cargills, Nestlé and Milco). This reduced transport costs and helped with better information for farmers on production techniques and post-harvest handling of the produce. The partnership with the private sector became a flagship for the Sri Lanka portfolio as

[90] As seen in Rwanda (#17 and #29) and various projects in Burundi.

a whole. There were, however, some questions in the PPE about the additionality in partnering with the private sector in Sri Lanka.[91]

Box 24
IFAD definition of private sector

> For IFAD, the private sector includes for-profit private business companies, private and institutional investors, commercial banks, investment funds, and certain state-owned enterprises. Private companies can be local, regional or global. They span the spectrum of size, from micro, small and medium-sized enterprises (MSMEs; including cooperatives, corporate farms and social businesses) to large multinational companies. Local MSMEs and rural entrepreneurs are predominately the end beneficiary and target group, as well as a source of knowledge, innovation and additional investments.

Source: *IFAD Private Sector Engagement Strategy 2019-2024*. EB 2019/127/R3 (IFAD, 2019).

238. **Strategic design and implementation problems.** A lack of strategic design and planning for better market access and value addition, limited know-how by design and implementation teams about markets and required investment costs and efforts, and strategic attention to markets within broader project contexts have been among the main problems for improved market infrastructure and systems in many countries (e.g. Georgia [#7] and Malawi [#38]). Difficulties in market infrastructure planning and capacity support were significantly underestimated even in projects that focused fully on markets (see box 25), such as Kenya (#8) and United Republic of Tanzania (#19).

Box 25
Issues of strategic design in market-oriented projects

> For Kenya (#8), launch and construction of the critical marketplace infrastructure for local horticulture sales was stalled early on in implementation. Outsourcing of design was required as the project management unit in the Ministry of Agriculture was not familiar with the planning for market access. At midterm, there was no evidence that market structures had undergone any rigorous economic and financial feasibility assessment. In the end, only 34 per cent of the planned marketplaces were fully operational and 18 per cent partially, even after a year of extension, and almost half were not operational or stalled. The evaluation notes the different views of business owners, producers and consumers, which were not informed by solid feasibility studies.
>
> For United Republic of Tanzania (#19), the project had to reduce its targets significantly an initial 120 to only 24 marketplaces, as they had not been well planned and budgeted for. For IFAD, the main lesson from this project was that facilitating and supporting private enterprises (microfinance institutions, producer/trader groups, and agribusiness) and value chains requires special skills and substantial resources. In the end, many marketplaces worked relatively well as they were effectively handed over and managed by local district councils adequately trained in operation and maintenance, together with beneficiary community groups. Marketplaces were fully integrated into district annual budgets and maintenance programmes.
>
> The sample project in Malawi (#38) evidently designed its warehouse and produce collection centres poorly, and many ended up unused or underused. Warehouse design was standard across communities ("one size fits all") and not necessarily adjusted to the commodities they were used for. Again, a lack of know-how and the late recruitment of value chain and agribusiness advisers caused many problems for the market access component. Structures sometimes led to crowding in of other initiatives and partners working on the ground, but the project did not take an active approach in planning or managing these complementarities.
>
> Insufficient attention to market components is also cited in other projects as the reason for poor performance. In Georgia (#7), enhanced commercialization and the development of associated rural enterprises was a primary project goal, with women being explicitly targeted. However, the project developed no strategy for business development and

[91] "Additionality" is about whether private investment and associated impact would not have happened anyway, without IFAD support.

product diversification and commercialization, except for investing into transport infrastructure hardware (e.g. bridges).

Source: ESR case studies.

239. Support was less frequent for expanded and new forms of product aggregation and processing, producers' organizations, and public-private partnerships. Often, this took place in projects and project components that specialized on livestock, fisheries or horticulture. Sometimes, expansions into markets emerged out of village users' associations that tried to add value to their production activities.

240. **Observations from the ESR on Smallholder Access to Markets and the Corporate-level Evaluation on IFAD's Engagement in Pro-poor Value Chain Development.** This ESR confirms many earlier observations by the ESR on smallholder market access (IFAD IOE, 2016) and the corporate-level evaluation on value chains (IFAD IOE, 2019) on the importance of the interplay between production and market infrastructure in value chains and that of physical infrastructure, and the building of capacities, institutions and other "intangibles" for achieve lasting impact and infrastructure sustainability.

241. Infrastructure is not only seen as important for vertical market integration and lower marketing risks but also for upgraded production and reduced production waste and storage losses (IFAD IOE, 2019). Combining a production and market infrastructure approach allows increased revenues for O&M and replacement of infrastructure (IFAD IOE, 2016).

242. There is no set combination of infrastructure needs that leads to greater access for smallholder farmers to markets achievements. This is a challenge for project design and implementation. Effective choice of what should be offered is often the outcome of extensive social and economic analysis of target populations, including the flexibility to adapt rapidly to market-driven changes (IFAD IOE, 2016).

243. There are implementation challenges in the choice of infrastructure technology and approaches, sequencing, participation, O&M, and sustainability. This suggests that each infrastructure element is rolled out as required to support the overall programme schedule (IFAD IOE 2016).

B. Infrastructure for natural resources management and climate change adaptation

244. IFAD has long experience with environmental issues, NRM, renewable energy resources and climate change. IFAD's specific experience and performance of NRM/CCA infrastructure based on the ESR portfolio sample and case studies is reviewed here, concerning climate-resilient infrastructure and renewable energies, and improved natural resources management, with special reference to water.

245. **Climate-resilient infrastructure.** Climate-proofing of infrastructure against future climate risks is a centrepiece of climate-smart actions, based on SECAP assessments (IFAD, 2018a). Given the expected long service life of small-scale infrastructure of from one to two decades, there is a clear need to redesign and overhaul it to withstand the strain of changing climates, recurrent droughts, floods, windstorms and warming temperatures (see box 26).

Box 26
Climate resilient infrastructure in Bangladesh and Sri Lanka

The Coastal Climate Resilient Infrastructure Project in Bangladesh (#40) is the only project in the ESR sample that explicitly aimed at climate-proofing infrastructure, specifically: coastal roads and market infrastructure to withstand cyclones, heavier monsoon rains and anticipated maximum flood and storm surge levels. This meant raising road levels by 20 cm and sturdier construction of marketplaces.* Climate-proofing allowed uninterrupted access to markets and contributed to increased incomes for the beneficiaries. The 2020 project performance evaluation (PPE) confirmed through spatial imagery and ground observations that the climate-smart construction proved effective during the 2020 cyclone.

Another example of protecting infrastructure from climate risks was seen in the Iranamadu Irrigation Development Project, Sri Lanka (#48). There, excess water from heavy rainfall was channelled through drainage canals, reducing the flood damage risks to constructions and paddy lands, and recapturing it for use. Releasing water from water storage places once every two weeks during the off-season helped to maintain groundwater levels and protect flora and fauna with longer-term resilience effects.

* The PPE says nothing about the technical aspects of climate-proofing for marketplaces, nor for roads beyond the 20 cm in increased height. Additional costs are not discussed.
Source: ESR case studies.

246. **Renewable energy.** Of particular interest in the context of climate change are renewable energy sources that allow rural communities and households to adapt their energy utilization to climate change and mitigate through the use of low-carbon, renewable energies. The review identified 11 projects that had some form of (mainly) renewable energy (see annex VIII).[92] Performance of renewable and other energy sources in these projects ranged from relatively marginal or ineffective[93] to those doing well and having a clear impact.[94] Those activities that were doing well were usually based on locally known technologies (hydroelectricity or biogas) that were scaled up, occasionally with some technical and social improvements. Projects provided mostly decentralized, small-scale, and often household-based technologies. Some other projects clearly suffered from poor analysis, planning and O&M, resulting also in poor demand, particularly regarding solar panel pumps and other installations.[95,96]

247. **Natural resources management and watersheds.** Eight projects in the portfolio sample and two case studies explicitly included NRM infrastructure activities.[97] All of these projects also aimed to develop some irrigation and drainage infrastructure, sometimes combined with NRM in a watershed approach, sometimes in more parallel ways.[98] In general, performance of NRM activities was good. NRM projects often showed some good results in increasing soil fertility, increasing upland water efficiency, and in reclaiming and stabilizing lands and forests.[99] Yet, objectives of linking NRM and irrigation management in a watershed approach worked only in some countries.[100] In other projects, it did not work out this way. For example, in The Gambia (#42), irrigation and most NRM activities took place in different project site locations and were unconnected.

248. **Integration through watershed development.** IOE reports raised a number of concerns about the relatively low integration and joint planning of NRM activities with

[92] Some solar energy activities were on a pilot basis only (e.g. #13, #33 and #37).
[93] Cameroon (#4), Malawi (#11), Mauritania (#7 and #8) and Tunisia (#10).
[94] Brazil (#12), China (#26), Nepal (#6), Pakistan (#16) and Rwanda (#17).
[95] Madagascar (#47), Malawi (#37), Mauritania (#13) and Tunisia (#33).
[96] Occasionally, high prices for other energy sources deterred beneficiaries, particularly the poor (Armenia [#1] and Mauritania [#12]).
[97] Burkina Faso (#22), Burundi (#42), Gambia (#46) Morocco (#14), Pakistan (#16 and #28), Rwanda (#17), Sri Lanka (#32) and Tunisia (#33 and #34).
[98] Burkina Faso (#22), Morocco (#14) and Tunisia (#33).
[99] For example, Burkina Faso (#22), Morocco (#14), Pakistan (#28) and Tunisia (#33).
[100] Rwanda (#17) and Sri Lanka (#32), and to a lesser extent Burundi (#42).

irrigation development, in a watershed approach (see box 27) or integrated in other ways. The PPEs/CSPEs called for "innovative integrated watershed approaches and sustainable natural resource management."[101] For projects with irrigation in the ESR sample, the reports called for much better integrated water management and watershed approaches.[102]

Box 27
The need for an integrated approach to watersheds (Burkina Faso)

The Burkina Faso project (#22) was fully oriented towards natural resources management (NRM). It successfully developed both degraded upland and lowland areas, mainly through relatively simple techniques, such as zaï planting pits, demi-lune microcatchments, stone barriers, dykes and some reforestation. Despite its strong NRM orientation, climate change was not sufficiently considered, with too little attention to microirrigation and water and soil conservation/soil protection and restoration. Lowlands should be more strongly considered as an entry point to NRM, as they generally mobilize rural communities for working in the subwatershed as a whole. Broader country experience (country strategy and programme evaluation) suggests that there are unresolved problems with land tenure security that can affect development and sustainability in NRM and watershed activities, especially for lowlands.

Source: ESR case study.

249. IOE reports recognize that integrated watershed development is very difficult, especially in many of the low-capacity and marginal areas where IFAD tends to work, as it requires integrated planning and implementation, across communities, and the reconciling of many different interests. Stakeholder interest, know-how and capacities of country local implementation partners cannot be taken for granted, nor can those of communities and farmers, as awareness is often low and interests diverge. Rwanda is a positive example of a country that introduced watershed approaches in most of its projects, including institutional structures for their implementation (#17, and to a lesser extent #29). Experiences from operations suggest making increasing use of GIS spatial and geographical data for watershed decision-making and monitoring, and to support the necessary capacities in countries (see box 28).[103]

Box 28
E-survey feedback on environment and natural resources management and climate change adaptation

The importance of watershed and landscape approaches was also raised in open-ended responses to the ESR e-survey question on climate change and resilience. Several comments concerned nature-based solutions and the reconciliation of the interests of upstream and downstream users. Among specific suggestions made were: include climate and environment assessments upstream in strategy and project design to affect choice of irrigation projects, partners and locations; consider not only the hardware design but also the services offered by nature-based solutions to protect hardware, i.e. landscape restoration to reduce erosion and siltation of canals; cross-disciplinary (i.e. natural resources management [NRM], engineering and gender) and inter-modal planning (i.e. land and water-based transport options). One respondent drew attention to multifunctional infrastructure for NRM and climate change adaptation goals: "Look not only at the protection of infrastructure against climate risks but make infrastructure multifunctional and proactively contribute to resilience – for instance, in roads for water – whereby roads are used not only for transport but also to contribute to water harvesting and water management."

Source: ESR e-survey.

[101] Examples include Morocco (#14), Pakistan (#16 and #28) and Tunisia (#33). In Tunisia, salty groundwater brought about soil degradation which was not adequately addressed in the project. For Pakistan, the environmental and NRM issue was brought into stark relief by a major earthquake when landslides in mountainous areas increased due to low forest coverage.
[102] Such as in Cameroon (#25), Georgia (#7), Mauritania (#12 and #13), Sudan (#18) and Viet Nam (#35).
[103] Based on Management comments on the draft final report.

250. **Water infrastructure for multiple purposes and water efficiency.** The sample of 35 projects included 21 projects that provided water infrastructure for different purposes. Water infrastructure straddles various categories, from domestic water supply to crop and horticulture production (including rainfed and irrigation), livestock drinking water and rangelands, fisheries and aquaculture, markets, and soil and water conservation. In most cases, there was no (evident) common framework of water resources planning, infrastructure provision and services for the different purposes. Usually, they were executed and carried out separately.[104]

251. A thorough water availability assessment – and of potentially competing interests – should be conducted the start of a project, to address demand peaks, for instance, in an oasis (Mauritania [#13]), or for seasonal vegetable gardens (Burkina Faso [#23] and Pakistan [#16]). An integrated approach is also required around livestock water facilities that are also used by people. In Sudan (#18), the construction of a new community water pipeline was simultaneously designed to provide water for 20,000 households and for animals. In a semi-arid ecosystem in Chad (#45), many different interests of pastoralists, settled communities, humans and livestock were taken into account in designing the system.

252. However, integrated management of water and other resources can be complex, especially for remote and fragile areas (Nepal [#27]).[105] Integration of different water supply systems and joint planning also often involves different agencies with specific mandates and jurisdictions, which are not always easy to coordinate and involve.[106] Transfer of responsibilities for water to local government areas could facilitate integrated planning, provided they have the capacities (Armenia [#1]).

253. **Towards multiple water-use systems.** The ESR Water (2014) concluded that water should be addressed in a more systematic and strategic manner, and that multisectoral infrastructure systems should be prioritized. An earlier IFAD (2006) report pointed to the benefits and costs of such multiple water-use systems, but also recognized that these systems tended to be more expensive than single-purpose water delivery systems (see box 29) (IFAD, 2006).

Box 29
Multiple-use water systems for sustainable and equitable water management

Water systems that provide services for multiple uses of water were promoted as a potential approach for achieving the Millennium Development Goals. While a livelihood approach is central to developing multiple-use water systems, there are technical (water sources and quality) and cost issues that need to be addressed if this approach is to work in poor rural communities. In order to promote more sustainable and equitable water management practices, water systems designed for delivering services for multiple uses tend to be more expensive than single-purpose water delivery systems. However, multiple-use water systems also have a greater potential for more user commitments in operation and maintenance. This is because they are able to provide a wide range of services to different users. The costs of designing, constructing, operating and maintaining such systems must be covered by water charges (which differ depending on the use) and subsidies.

Source*: Securing Water for Improved Rural Livelihoods: The Multiple-Uses System Approach*. Gender and Water (IFAD, 2006).

254. In sum, climate-smart infrastructure is more than climate-proofing and ensuring there is no harm for safeguards. Such infrastructure includes broader watershed and landscape planning and complementary climate-smart technologies, and it works for

[104] The reports identified separate and unrelated systems for water supply for irrigation, human consumption and livestock, such as in: Lao People's Democratic Republic (#9 and #10), where completely separate systems exist for drinking water, through tanks and gravity, and lowland irrigation; and Mauritania (#12), where irrigation is based on recess water of the Senegal River, and village water supply relies on boreholes.
[105] In Sudan (#18), works related to building ponds for livestock were suspended due to a lack of clarity regarding policy and responsibilities for O&M of stock watering.
[106] In Mauritania (#13) and in Morocco (#14), IFAD did not have the right government partners involved.

positive NRM/CCA objectives and externalities for resource protection, environment and climate resilience.

255. Second, for IFAD, climate-smart infrastructure is less about the "what to do," and more about: how to do it (design and country capacity-building); who to do it with (the right partners at corporate level and obtaining buy-in from countries and project sites); how do deal with some of the more complex planning requirements (multisectoral and intercommunity); and how to share incremental costs and benefits (i.e. additional costs and costs for external benefits). Last, and importantly, climate-smart infrastructure is about how IFAD's particular target groups are involved and can benefit.

256. If successful, IFAD can use climate resilience and green infrastructure as important forward-looking and innovative themes to contribute to "next-generation infrastructure" and related technologies, also in view of contributing to SDG 9, which is about innovation and infrastructure.

C. Infrastructure in countries with fragile situations

257. The IFAD Strategy for Engagement in Countries with Fragile Situations (2016) has a clear definition of fragility and its main drivers: "Fragility is a condition of high vulnerability to natural and man-made shocks, often associated with an elevated risk of violence and conflict. Weak governance structures along with low-capacity institutions are a common driver and consequence of fragile situations." Countries with fragile situations are commonly characterized by weaker governance systems and by institutions that lack the capacity and the ability to respond to shocks. The 2005 Senior Level Forum on Development Effectiveness in Fragile States highlighted in its definition that fragility is characterized by situations where "the state power is unable and/or unwilling to deliver core functions to the majority of its people: security, protection of property, basic public services and essential infrastructure" (IOE, 2015).

258. **Infrastructure choices.** Infrastructure in fragile and conflict-affected situations is important to alleviate low economies of scale, communities in isolation, high costs of accessing markets, and poor basic social services (ADB, 2013). Economic returns to infrastructure investments in post-conflict environments are likely to be very high. IFAD-supported projects in countries with fragile situations that were sampled in this ESR had a strong focus on the rehabilitation and development of productive infrastructure, particularly related to water and watershed management/NRM and that of social infrastructure. Transport also appeared in several cases.

259. **Water management and irrigation.** Large- and small-scale irrigation infrastructure can contribute significantly to food security when well managed and coupled with market access. The greatest potential returns in countries with fragile situations are expected from the rehabilitation of existing but damaged irrigation infrastructure, and from stimulating community-led, small-scale, agricultural water management (UK Aid, 2012). Case studies and sample projects with watershed management and rehabilitated irrigation include Burundi (#42), The Gambia (#46), Georgia (#44), Sri Lanka (#48) and Sudan (#18). Two other countries with fragile situations, covered by the CSPE sample, were Afghanistan (only recently approved)[107] and Niger. They have significant irrigation schemes and are among the Top Ten IFAD countries with infrastructure investments.

260. The review shows that irrigation and watershed projects in these countries reported problems with technologies[108] and the sustainable management of these schemes.

[107] In Afghanistan, the Arghandab project (approved in late 2019) focuses on small-scale and well-targeted river valley irrigation schemes that are owned, operated, and maintained by village communities.

[108] The technologies were either too low-tech and short-lived (Burundi and The Gambia [early schemes]), or the projects were ones that introduced relatively high-technology and high-cost systems that required too much technical maintenance support, operational management and expenses (The Gambia, Georgia, Niger [earlier schemes] and Sudan [later schemes]).

In Sudan, irrigation management was transferred to WUAs, but low profitability and lingering uncertainties about tenancy undercut these organizations and beneficiaries' interest. There were large efforts for institutional strengthening of government irrigation scheme managers (for river off-take and main canals), but governance of secondary and tertiary canals remained weak. In recent projects in Niger, too few resources have been invested in WUAs and communal management for rehabilitating small-scale irrigation infrastructure and ensuring economies of scale in these schemes. Many of these problems require capacities and support that are often in particularly short supply in countries with fragile situations.

261. In countries with fragile situations, IFAD has invested relatively more (see portfolio analysis in chapter II) into natural resources infrastructure for soil and water management, for example, in Burundi, The Gambia and Niger. These are often plot-specific activities to increase productivity, with small water-retaining structures and erosion control (e.g. bunding, contours, terracing, tree planting). However, they also include the promotion of integrated watershed and landscape management solutions that include lowland irrigation schemes (Burundi and The Gambia). Their advantage in fragile situations is that they usually use mainly local materials and are labour-intensive. They offer the opportunity of food and cash for work for farmers to increase their income sources and assets. At the same time, farmers can learn about new NRM and climate-sensitive soil and water management methods. These activities were usually well carried out and adopted (Burundi and Niger), although their lasting effects and adoption by farmers was occasionally questioned (The Gambia). Some technologies were too costly and low-yielding for farmers to be adopted (terracing in Burundi). Capacities for watershed or landscape planning are often weak in countries with fragile situations.

262. **Social infrastructure** (schools and health facilities) is relatively easy to construct in fragile contexts, but the impact is highly dependent on adequate services provided in the new facility, for which institutional strengthening as well as access to the facilities are prerequisites (UK Aid, 2012). Social infrastructure is also in high demand in fragile situations. When well managed and delivered, social infrastructure can galvanize interest in a project and community participation at a point when productive infrastructure is just starting to deliver.

263. The review found that social infrastructure has clearly contributed to rural poverty impact and enhancement for women, in particular in the form of education, health, and household water supply (Burundi, Democratic Republic of the Congo and Sudan). In Sudan, significant benefits came from the project's integrated water access for households, supported by a community development and empowerment component and enhanced livelihood options through access to finance, with a focus on women. In Chad, social capital improvements were found through the mobile education and basic health infrastructure for pastoralists. However, the ultimate impact was disappointing in terms of delivery and targeting, although physical targets were mostly reached.

264. In principle, social infrastructure construction and rehabilitation are technically relatively simple, but their realization and impact were not always easily achieved. Social infrastructure was sometimes relegated in projects to cofinanciers that did not deliver well, did not deliver on time, or pulled out. These cofinanciers included: OFID in Burundi, which delivered very late due to outstanding government arrears; the Belgian Fund for Food Security in Democratic Republic of the Congo and in Niger, where either quality or delivery of infrastructure was not satisfactory and led to discontinuation; and AFD and the Swiss Agency for Development and Cooperation, which were supposed to take on the social infrastructure component in the project, but then decided otherwise.

265. The physical quantities of delivered structures were not always high (Democratic Republic of the Congo and Niger) and the quality of services and beneficiary

participation were questioned, in particular when established in a rush or when plans were changed (Burundi and Chad). In Niger, the planning and functioning of social infrastructure was hampered by complex participatory planning and, ultimately, official ministry validation processes, which led to discontinuation.

266. **Road and other market access infrastructure.** Road and other transport construction and maintenance can provide significant short-term employment opportunities, as well as boosting economic opportunities, but sustainability requires institutional strengthening. For the reviewed sample, Democratic Republic of the Congo, The Gambia and Niger included rural roads, with varying emphasis over time. In Niger (CSPE 2011 and CSPE 2020), roads were built in good quality, but at higher costs than expected and with questionable maintenance arrangements. Many roads were not built with the specific purpose of linking farm producers to their markets. However, Niger is the only country in the sample that also invested in infrastructure to avoid produce losses through better storage and to achieve higher prices, which worked relatively well. In Democratic Republic of the Congo, fewer roads were built than planned at design (only 30 per cent), and user groups and local governments were not well equipped for their maintenance.

267. **Institutional choices.** The review examined CDD as an effective modality in fragile and post-conflict situations. Community mobilization and participation for infrastructure design and operation from the outset, and beneficiaries' continued involvement in user groups are paramount for functioning and sustainable infrastructure. In many countries with fragile situations where central or local government structures did not work well, the CDD approach worked better (ESR CDD).[109]

268. For the sample cases reviewed in this ESR, several projects had very positive experiences when relying on community development as the post-conflict starting point of mobilization (Burundi), working with existing community organizations to generate and operate infrastructure (Democratic Republic of the Congo and The Gambia), and investing heavily into the capacities of communities and community organizations (Chad in particular). In Afghanistan, capacity-building for community-based and beneficiary-governed institutions is an explicit part of the country programme's strategic objective 3 (Country Note).

269. In Burundi, community development has been noted as an essential pillar since the early 2000s today (Burundi COSOP 2008 and COSOP 2016). In The Gambia, IFAD worked with traditional work groups (*kafos*), in particular of women, with positive results for the continuity of project activities and results. In Chad, the Pastoral Water and Resource Management Project in Sahelian Areas generated a complex but workable system, with separate committees for the management of wells, the surveillance of ponds, and the long-term maintenance of hydroinfrastructure. The main tasks of these committees were to: ensure access for all intended users and the proper use of the generated infrastructure; prevent and manage potential conflicts among different users; and ensure periodic maintenance. As in The Gambia, community building efforts did not start from scratch but relied on past work by other projects with the same or similar communities.

270. **Capacity and governance constraints.** Four factors deserve particular attention for effective community mobilization and development based on observations in countries with fragile situations. First, capacity-building in the form of training was often done as a one-time activity. However, to be effective, it usually requires continuous follow-up, booster training and engagement with groups (The Gambia).

[109] Provision of infrastructure through CDD as part of a post-conflict/post emergency approach was effective in Cambodia (#24), Pakistan (#16) and Nepal (#27). Nepal (#27) was originally designed in 2001 within a fragile political situation (i.e. Maoist insurgency). In Pakistan (#16), the massive earthquake in October 2005, with a death toll of about 75,000 people, meant that the priorities of the Government and the population shifted to relief, reconstruction and rehabilitation. In Nigeria (#15), the project effectively delivered infrastructure in a fragile situation in the country's terrorism-threatened north.

Second, in reaching IFAD's main target groups, some trade-offs had to be made. In Democratic Republic of the Congo, it was not possible to work in the more remote and poorer areas that IFAD usually targets, partly due to the security circumstances. The project primarily worked in areas closer to urban centres and major roads. In The Gambia, the fact that IFAD was working with long-established community groups limited access to project benefits by some poorer community members that were not part of these groups. Third, it was challenging to convince different community groups and service providers to work together, across communities and activities, for better results, exchange experiences and address common intercommunity objectives. This was often not sufficiently the case or encouraged by project management (Chad and The Gambia). Last, a major constraint in effective institutional support for rural infrastructure, in particular infrastructure involving land and water and major improvements of these basic resources, takes the form of land tenure issues and water rights, which often became particularly sensitive in settings with fragile and post-conflict situations. Several projects reported that social and land tenure complexities had been considerably underestimated (Burundi, Niger and Sudan). In particular, this was the case in Sudan, where the intended land tenancy reform process remains incomplete and continues to have a negative effect on project performance.

271. **Working with government counterparts and other implementing organizations.** Building institutional capacity in state institutions requires a long-term strategic perspective. There may be difficult choices to be made about how far it is worth supporting short-term investments that are carried out in ways that do not build (and may weaken) capacity, given the need for institutional capacity if sustainable impact is to be achieved (UK Aid, 2012).

272. The review shows that IFAD worked with several kinds of intermediaries, always including certain government agencies that were available in one way or another in all countries, as well as with civil society organizations (in particular, in Burundi and Chad), and some private and semi-private service providers (Afghanistan, Chad and Democratic Republic of the Congo). In all sampled projects cases with fragile situations, government played a major role. The involvement of line ministries that have a mandate for the specific activities that the project works in is absolutely critical for moving ahead with infrastructure construction and operations without major delays and complications. For instance, aligning and having cooperation from different ministries are seen as key for project success in Afghanistan, concerning the Ministry of Agriculture, Irrigation and Livestock and the Ministry for Rural Rehabilitation (Country Note).

273. **Weak governance.** An extremely weak institutional environment in many countries with fragile situations creates difficulties for the management of procurement processes using the normal procedures of international development agencies, and this has contributed to delays in implementation because of fiduciary risk aversion. Bypassing normal procurement and management processes can fuel corruption, which may itself have been a driver of conflict and undermined peacebuilding and state-building efforts. Equally, bypassing government systems in order to reduce the risk of corruption can lead to a lack of local ownership and, hence, affect the sustainability and future maintenance arrangements.

274. Poor government capacity led to very low disbursements and outputs in Democratic Republic of the Congo: 56 per cent, and only 36 per cent for infrastructure. Projects in Chad and The Gambia faced heavy and prolonged procurement and delayed execution of works due to government capacities for planning, execution and supervision of subcontracts. This was compounded by limited capacities of infrastructure construction companies and other service providers to provide proper bids and implement the work. There is scope for capacity-building of such companies, which has not been widely applied so far. However, not all strengthening of state planning and management capacities bears fruit. In Sudan, large efforts were made

to institutionally strengthen government irrigation scheme management (such as for river off-take and main canals), but other key institutions, complementary production and market activities remained weak and prevented the irrigation schemes from performing well. Projects in Democratic Republic of the Congo and The Gambia did not manage to keep themselves insulated from political perturbations and fiduciary management interference, including very frequent changes of senior government officials and managers, even arrests.

275. In the recently approved projects in Afghanistan, the risk-mitigation measures taken for weak government capacities for project management and poor fiduciary management are: intensified capacity-building of government institutions and that of service providers on project management; the recruitment of "reputable national and international service providers;" and a participatory community approach to enhance transparency at the field level.

276. **Sustainability.** Sustainability of all forms of infrastructure is the weakest link in countries with fragile situations, where institutional and technical support, beneficiary capacities and financial resources for keeping infrastructure operational are in short supply. Without exception, all case studies see a very small likelihood of sustainability unless arrangements are made for post-project technical infrastructure support, institutional group support, and continued contributions to O&M costs. Some countries and projects do not even have an exit strategy or have only weak ones (Chad). Difficulties in sustaining participation and management through grass-roots organizations are widely acknowledged (Niger). At the same time, governments in these countries do not demonstrate the capacity or political will for contributing to long-term financial and technical capacity support and service provision (The Gambia and Niger). After the project finishes, farmers can no longer rely on government maintenance or continued training and advisory services. While this issue was prominently raised in The Gambia when the latest COSOP was developed, IFAD could not convince the Government to adopt project-generated irrigation and drainage infrastructure as a public good to ensure its sustainability.

277. In order to enhance the prospects for sustainability, IFAD has adopted more programmatic and long-term approaches in countries with fragile situations. It has sometimes done so with an emphasis on infrastructure (Burundi COSOP 2016), and through ensuring some overlaps across different projects to maintain support to beneficiaries over time and further develop and refine models to ensure long-term solutions and sustainability (Burundi, Chad, The Gambia and Niger).

278. **The lessons** coming out of these countries with fragile situations are that: (i) infrastructure solutions require long-term perspectives, working with target populations over time, testing and advancing institutional capacities and concepts, and building up reliable partners; (ii) cofinanciers, development partners and advocacy for IFAD-supported populations and solutions are important elements as IFAD has too few resources to address many infrastructure issues on its own; (iii) political dialogue with the Government and others is critical on issues from enabling policies, such as on ownership and land security to legal status and responsibilities of groups, and institutionalizing government support services, and markets; and (iv) sustainability of much of rural infrastructure can only be achieved through continued government contributions to sustainable solutions, including those by local governments.

Key points (chapter VI)

- **Infrastructure for market access for smallholder farmers and value chains.** The most common and generally rated satisfactory form of market infrastructure was the construction of roads, bridges and other forms of transport to and from markets. The construction of enhanced marketplaces, stalls, warehouses and other storage facilities had varying success.
- Projects that supported livestock production, aggregation and processing for dairy and meat were able to raise household incomes through better market outlets and prices.
- Without adequate capacities, funds and authority, the necessary market business plans were not developed, and market operations and infrastructure not managed effectively. Moreover, the constitutional and legal enabling frameworks were also often insufficient.
- The ESR found only a few cases in its portfolio sample and case studies where projects successfully managed to engage the private sector as a partner and cofinancier in market operations for market access for smallholder farmers.
- **Infrastructure for natural resources management and climate change adaptation.** Climate-proofing of infrastructure against future climate risks is a centrepiece of climate-smart action, based on SECAP assessments. The review sample included only one project, the CCRIP in Bangladesh (#40) that explicitly aimed at climate-proofing infrastructure, specifically, coastal roads and market infrastructure.
- The review sample included 11 projects that had some form of (mainly) renewable energy. The performance of renewable and other energy sources in these projects was variable. Those activities that were doing well were usually based on locally known technologies (hydroelectricity or biogas) that were scaled up, occasionally with some technical and social improvements.
- NRM projects often showed some good results in increasing soil fertility, increasing upland water efficiency, and reclaiming and stabilizing lands and forests. However, objectives of linking NRM and irrigation management in a watershed approach worked in only some countries.
- Twenty-one of the 35 sample projects included water infrastructure for different purposes. However, there was a common framework of water resources planning and infrastructure provision and services for the different purposes. Usually, they were executed and carried out separately. Integration of different water supply systems and joint planning involves different agencies with specific mandates and jurisdictions, which are not always easy to coordinate.
- **Infrastructure in countries with fragile situations.** Infrastructure in fragile and conflict-affected situations is important in order to alleviate low economies of scale, communities in isolation, high costs of accessing markets, and poor basic social services. Economic returns to infrastructure investments in post-conflict environments are likely to be very high. Large- and small-scale irrigation infrastructure can contribute significantly to food security when well managed and coupled with market access.
- Projects had very positive experiences with relying on community development as the post-conflict starting point of mobilization, working with existing community organizations to generate and operate infrastructure, and investing heavily into the capacities of communities and community organizations.
- Weak government capacities are among the greatest risks for implementation in countries with fragile situations. In Afghanistan, IFAD has focused more on: intensified capacity-building of government institutions and that of service providers on project management; the recruitment of "reputable national and international service providers;" and a participatory community approach to enhance transparency at the field level.
- Sustainability of all forms of infrastructure is the weakest link in countries with fragile situations, where institutional and technical support, beneficiary capacities and financial resources for keeping infrastructure operational are in short supply.

VII. Conclusions and recommendations

A. Conclusions

279. **IFAD infrastructure investments were relevant and overall effective in their contribution to poverty reduction.** Overall, infrastructure subprojects achieved the set targets but technical quality and arrangements for sustainability were often unsatisfactory. Outcomes and impact were better when different categories of infrastructure activities were combined and when they were matched with adequate capacity-building and stakeholder engagement early on. Infrastructure was more effective when designed at the right and manageable scale, integrated with complementary activities, and carried out with broad community participation. The provision of infrastructure has been demand-led but requires more attention to institutional delivery, governance and ownership arrangements for sustainability and impact.

280. **Ownership and multi-stakeholder capacity-building were important preconditions to ensure that infrastructure is well taken care of.** User participation has been critical for operation and sustainability but the engagement of local administrations was important, too. There has not been enough dedicated technical know-how, and sometimes insufficient priority, among IFAD's traditional government partners to support the ongoing transition from government-owned (and -maintained) infrastructure to more inclusive and stakeholder-owned models. Users' groups – the trademark IFAD model – tended to be too weak to fulfil the expected functions, and private sector participation in operation and maintenance has been rare. Institutional governance and capacity-building of users' associations and farmers' groups at the community and local levels require longer-term engagement, incentives and clear transition and exit strategies. Last but not least, the transition from largely publicly provided storage to more market-oriented storage and processing facilities will require better engagement with private sector stakeholders.

281. **Water-related infrastructure has been an area of focus for IFAD; greater efforts are required to address efficiency and sustainability issues.** Drinking water has long been an essential part of IFAD-supported projects and it remains in high demand. The need for clean water remains a top priority of women and very poor people in most communities. Yet IFAD's investments in drinking water have plunged to almost zero in recent replenishments. Provision of water for crops and livestock is in high demand too, but innovative and more sustainable types of productive water use and irrigation systems are required. There is much scope to improve the efficiency and sustainability of water-related interventions, including irrigation. Water management and irrigation would benefit from closer attention to NRM and climate risks (climate-smart design) within landscape and watershed approaches. Integrated and multiple water use approaches would improve water use efficiency and climate resilience, and enhance the sustainability of productive water use and irrigation systems.

282. **Innovations and climate-smart infrastructure are important forward-looking and innovative themes** to contribute to the "next generation infrastructure" and related technologies, also in view of contributing to SDG 9 on innovation and infrastructure. There is increasing demand for this type of infrastructure – such as higher-quality submersible, concrete-reinforced roads, a larger variety of technical irrigation models to enhance water use efficiency in climate crises, renewable energy and more applications of digital infrastructure solutions. Climate-smart infrastructure includes broader watershed and landscape planning and complementary climate-smart technologies, and works for positive NRM/CCA objectives and related externalities. Renewable energy infrastructure decentralized to communities or households, mainly executed as pilots, deserves more attention

for its multiple social and economic benefits, particularly for women, and its importance for NRM and climate resilience.

283. **In countries with fragile situations, infrastructure solutions require particularly long-term perspectives** in working with target populations over time; testing and advancing institutional capacities and concepts; and building-up reliable partnerships. In such situations, cofinanciers, the identification of new development partners (particularly civil society organizations), advocacy for IFAD's target groups and solutions are even more important as IFAD lacks the resources and traditional partners to address many infrastructure issues on its own. Policy dialogue with the government and other parties is often critical to facilitate enabling policies on ownership and land security; legal status and responsibilities of groups; institutionalizing government support services; and markets. In the end, sustainability of much of the rural infrastructure in fragile situations can only be achieved through increased government contributions, including those by local governments.

284. **IFAD has a positive track record and added value but it needs to step up its internal technical capacity and guidance** for the provision of infrastructure. IFAD is relatively experienced, mainly through tacit staff knowledge, in water and irrigation, roads/transport and social infrastructure. However, it lacks sufficient support for and attention to infrastructure in terms of specialized technical staff, safeguards, climate risk expertise and resources, and M&E capacity in design, implementation support and supervision. Hence, there is an urgency to reconcile IFAD's strategic infrastructure approach with its infrastructure support capacity.

285. **Demand for infrastructure investments in partner countries is expected to increase, particularly in middle-income countries** where the decreasing availability of concessional loans and grants drives the demand for productive investments. Such demand has already become visible in some countries that have moved from low- to middle-income status, such as Uganda. There is less willingness to borrow at close-to-market rates for soft infrastructure investments unless these are closely linked with hard infrastructure. IFAD's mandate and mixed performance in infrastructure suggest that some caution is needed in scaling up these investments. It will also require careful assessment of public and private partnerships and the associated costs and risks. Cofinancing partnerships were instrumental for IFAD to provide infrastructure at scale and to provide complementary hard and soft infrastructure parts. However, these partnerships often increased the transaction costs for both IFAD and its government partners.

286. **Above all, any IFAD niche in infrastructure and increased future borrowing for infrastructure need to stay closely linked to IFAD's mandate** to facilitate better access and sustainability for IFAD's core target groups and to minimize elite capture. This could include supporting small-scale irrigation schemes; tapping into larger infrastructure investments and schemes through cofinancing; enhancing access for the poor and for women; connecting to value chains; and effectively linking and phasing hard and soft infrastructure. IFAD's comparative advantage clearly lies in the provision of small-scale, climate-smart and pro-poor infrastructure in line with its mandate, but this needs to be articulated more clearly at the strategic level. Meeting the demand of IFAD's core target group also requires balancing the provision of productive and market infrastructure with infrastructure that caters for basic needs, such as drinking water.

B. Recommendations

287. **Recommendation 1. Prepare a corporate strategy to clarify IFAD's approach to scaling up pro-poor infrastructure**, including partnerships and systems for tracking the effectiveness and impact of these investments. The strategy would define the kind of infrastructure that IFAD is best placed to support, that is scalable and that would enable IFAD to better achieve its corporate objectives. Rehabilitation

of existing irrigation is a common activity in IFAD's projects, but it is rarely sustainable. IFAD should decide the extent and conditions under which it will continue financing irrigation rehabilitation. The strategy would clarify options for resource acquisition and use, taking into consideration the time and transaction costs for partnership-building at the project level. Finally, the strategy will need to define a better approach to tracking the performance and results of infrastructure investments at the corporate level, including hard and soft infrastructure activities. The strategy should provide a common framework for IFAD; regional differentiations will be required to respond to the demand and capacity on the ground.

288. **Recommendation 2. Adopt a comprehensive approach to strengthening know-how and capacity for infrastructure support,** to cope with the increasing demand for rural infrastructure investments. IFAD infrastructure experts, capacity-building and knowledge management have to be strategically deployed at all levels to adequately support investments. Technical expertise (and staff) needs to be maintained at the headquarters level to oversee the preparation of knowledge products and guide the implementation of corporate policies and priorities at regional levels. IFAD should consider financing and facilitating the recruitment of qualified external assistance, when needed (such as through accredited consultants), and help its partners in countries to gradually build the relevant capacity. The growing demand for green infrastructure will require better alignment of corporate human and financial resources for CCA and SECAP.

289. **Recommendation 3. Strengthen attention to pro-poor infrastructure governance during design and implementation**; establish synergies with complementary investments, reforms and policy initiatives for enhanced sustainability and impact. IFAD has corporate mechanisms to enhance the quality of infrastructure investments, but these have to be effectively used. Infrastructure requires proper institutional governance arrangements, enabling policy, legal and regulatory frameworks, and capacities to perform and deliver the expected benefits. Exit strategies deserve more attention from the outset. Community-based approaches and capacity-building for users' groups need to be better linked with existing institutional and policy frameworks for sustainability. Potential conflicts and trade-offs in the provision of public infrastructure goods (land and equality issues) need to be addressed more systematically through safeguards (something to be followed up by the Quality Assurance Group). The inclusiveness of the approach and the sustained benefits for poor men and women need to be monitored and reported through supervision, as do SECAP requirements and management plans.

Evaluation framework

	Questions	Corporate-level documents review	Focus Group Discussions (FGDs) and interviews	Review of evaluation sample	Case study	evaluation criteria
Q1	**Main question 1:** How well is the International Fund for Agricultural Development (IFAD) set up (strategically, institutionally and capacity-wise) to address the demand for infrastructure by providing (or leveraging) the financial and technical support required to properly plan, manage and supervise projects with significant infrastructure investments**?**					
Q1.1	***Questions on strategy***					
	How is infrastructure expected to contribute to IFAD's strategic objectives (globally and at country level)?	√	√	√	√	Relevance
	Does IFAD have a generally agreed-on and well-understood definition for infrastructure? How are sub-categories -sectors with infrastructure investments defined?	√	√			Relevance
	How does IFAD track the current volume and performance of infrastructure investments at corporate level? To what extent are sub-categories of infrastructure monitored? How could data collection and analysis be improved?	√	√			Relevance
	What are the main factors driving infrastructure investments at IFAD? (e.g. Country demand, Performance-Based Allocation System [PBAS] allocations, project cycle issues such as Social, Environmental and Climate Assessment Procedures [SECAP] requirements, etc.). Why infrastructure remains a priority for Government?	√	√	√	√	Relevance
	What is the demand for infrastructure investments (and what type of infrastructure) in fragile and post-conflict environments?			√	√	Relevance
	What is IFAD's comparative advantage in the provision of (soft and hard) infrastructure?	√	√	√		Funding instruments, arrangements and partnerships
	What are the factors driving or limiting IFAD's investments into infrastructure?					Relevance
Q1.2	***Questions on co-finance***					
	What are the (strategic or prevailing) co-financing partnerships for provision of infrastructure?	√	√	√	√	Funding instruments, arrangements and partnerships
	Are the institutional and financial arrangements for co-financing working in a complementary manner at operational levels?	√	√	√	√	Funding instruments, arrangements

	Questions	Corporate-level documents review	Focus Group Discussions (FGDs) and interviews	Review of evaluation sample	Case study	evaluation criteria
						and partnerships
	How does IFAD ensure that its policies and requirements are taken forward in co-financed (infrastructure) operations?					Funding instruments, arrangements and partnerships
Q1.3	***Questions on risk management***					
	How is IFAD managing the (environmental and social) risks in relation to infrastructure provision?	√	√			Performance and results
	To what extent are SECAP (and earlier versions of IFAD safeguards) and Free, Prior and Informed Consent (FPIC) requirements applied? Does IFAD have the capacity to implement SECAP?		√	√		Performance and results
	How are safeguards applied in co-financed projects?		√	√		Performance and results
Q1.4	***Questions on IFAD capacities***					
	To what extent does IFAD provide the required technical expertise (engineering, financial and social) to design, supervise and/or monitor (hard and soft) infrastructure components?		√	√		Performance and results
	To what extent is knowledge on (hard and soft) infrastructure documented and shared?	√	√	√		Scaling up
Q2	**Main question 2**: How does infrastructure, within project-level theories-of-change, contribute to higher-level outcomes and impacts, such as poverty reduction and inclusive development? How can impact be most effectively, efficiently and sustainably achieved through special attention to smallholder commercialisation, markets and value chains in infrastructure design and operations?					
Q2.1	***Questions with regard to overall performance***					
	How effective are IFAD's investments into infrastructure?			√	√	Performance and results
	How do infrastructure-heavy project perform (according to Independent Office of Evaluation [IOE] criteria) compared to the rest of the portfolio?			√		Performance and results
	What are the results and impacts of IFAD infrastructure investments, particularly in the context of projects supporting smallholder value chains and market access?			√	√	Performance and results
	How do infrastructure projects perform along the specified performance indicators?			√	√	Performance and results

	Questions	Corporate-level documents review	Focus Group Discussions (FGDs) and interviews	Review of evaluation sample	Case study	evaluation criteria
	How does (hard) infrastructure complement the non-infrastructure parts of the project and vice versa? To what extent does the phasing of activities enable complementarity?		√	√	√	Performance and results
	To what extent does IFAD supported infrastructure provide value for money? How does Value for Money (VfM) compare between types of infrastructure?		√		√	Performance and results
Q2.2	***Questions on targeting***					
	What are effective (governance) arrangements to ensure that IFAD's target groups benefit from infrastructure?			√	√	Pro-poor and gender responsive infrastructure
	Are there any good practices for pro-poor or gender responsive infrastructure provision?			√	√	Pro-poor and gender responsive infrastructure
	To what extent do IFAD's targets groups participate in the identification, planning and implementation of infrastructure sub-projects? How (and to what extent) are target groups (as users) involved in the operation and maintenance?		√	√	√	Pro-poor and gender responsive infrastructure
Q2.3	***Question on climate change***					
	To what extent do IFAD infrastructure investments contribute to the ultimate climate resilience of IFAD beneficiaries?			√	√	Climate change resilience
Q3	**Main question 3:** What is required, in terms of funding, capacity building and institutional arrangements, to make IFAD-funded infrastructure effective and sustainable for rural poor people in the longer term?					
Q3.1	***O&M***					
	What are the prevailing institutional, implementation and operation and maintenance (O&M) arrangements and how did these affect the performance of the projects?		√	√	√	Performance and results
	Are there sufficient investments into "soft" infrastructure (capacities, institutions) to ensure that the "hard" infrastructure is functional and sustainable?		√	√	√	Performance and results
	To what extent is the infrastructure provided part of broader governance structures (e.g. last mile) or fully decentralised (e.g. community led)?			√	√	Performance and results

	Questions	Corporate-level documents review	Focus Group Discussions (FGDs) and interviews	Review of evaluation sample	Case study	evaluation criteria
	Are there any innovative arrangements in the provision and maintenance of infrastructure? In particular: What role can the private sector play in the provision and maintenance of infrastructure?		√	√	√	Innovation
	Does IFAD pay sufficient attention to the absorptive capacity for infrastructure investments at community level, particularly in view of their ongoing utilization and sustainability beyond project end? To what extent are IFAD targets groups willing and able to pay for the use of infrastructure?			√	√	Sustainability
Q3.2	***Sustainability***					
	How do IFAD projects plan and provide for the technical, economic, social and environmental sustainability of infrastructure investments?	√		√	√	Sustainability
	Are ownership arrangements and hand-over (responsibility for O&M) clearly defined in the institutional set up?			√	√	Sustainability
	Are costs adequately planned and estimated to ensure continued functioning of the infrastructure?			√	√	Sustainability
	What could IFAD do to enhance the sustainability of (hard and soft) infrastructure?				√	Sustainability
	What could IFAD do to enhance the sustainability of (hard and soft) infrastructure?					Sustainability

List of projects sampled for review

Table A2.1
Sample selected for qualitative review of evaluation reports (38 projects)

ESR Ref. No.	*Region Code*[1]	*Country*	*Fragility Status**	*Project Number (GRIPS ID)*	*Project Name*	*Evaluation type*[2]	*Approval date*	*Closing date*	*Total Budget, in US$ M*	*IS Investment Share (of budget), %*
#1	NEN	Armenia	Not fragile	1100001307	Rural Areas Economic Development Programme (RAEDP)	PE/PPA/IE	02-Dec-04	31-Mar-10	20.8	45.1%
#2	NEN	Azerbaijan	Not fragile	1100001289	North East Rural Development Project (NDP)	PE/PPA/IE	09-Sep-04	31-Mar-12	12.6	43.0%
#3	APR	Bhutan	Not fragile	1100001296	Agriculture, Marketing and Enterprise Promotion Programme (AMEPP)	PE/PPA/IE	19-Apr-05	31-Dec-12	15.6	52.3%
#4	APR	Cambodia	Not fragile	1100001350	Rural Livelihoods Improvement Programme (RULIP)	PE/PPA/IE	18-Apr-07	31-Mar-15	13.2	51.0%
#5	WCA	Cote d'Ivoire	Fragile	1100001435	Agricultural Rehabilitation and Poverty Reduction Project (ARPRP)	PE/PPA/IE	17-Dec-09	30-Jun-15	22.7	55.9%
#6	WCA	Dem. Rep. Congo	Fragile	1100001311	Agricultural Rehabilitation Programme in Orientale Province (PRAPO)	PE/PPA/IE	11-Dec-05	30-Apr-14	17.7	60.5%
#7	NEN	Georgia	Not fragile	1100001507	Agricultural Support Project (ASP)	PE/PPA/IE	17-Dec-09	31-Mar-16	13.7	64.8%
#8	ESA	Kenya	Not fragile	1100001330	Smallholder Horticulture Marketing Programme (SHoMaP)	PE/PPA/IE	18-Apr-07	30-Jun-15	23.9	66.3%
#9	APR	Laos	Not fragile	1100001207	Oudomxai Community Initiatives Support Project (OCISP)	PE/PPA/IE	23-Apr-02	30-Sep-10	16.9	49.3%
#10	APR	Laos	Not fragile	1100001301	Rural Livelihoods Improvement Programme in Attapeu and Sayabouri (RLIP)	PE/PPA/IE	19-Apr-05	30-Sep-14	23.8	30.4%
#11	ESA	Madagascar	Not fragile	1100001318	Project to Support Development in the Menabe and Melaky Regions (AD2M)[1]	PE/PPA/IE	20-Apr-06	30-Jun-16	20.3	37.6%
#12	WCA	Mauritania	Not fragile	1100001179	Poverty Reduction Project in Aftout South and Karakoro (PASK)	PE/PPA/IE	12-Sep-01	30-Jun-10	14.8	44.4%

[1] APR: Asia and the Pacific; ESA: East and Southern Africa; LAC: Latin America and the Caribbean; NEN: Near East, North Africa and Europe; WCA: West and Central Africa.
[2] PE = project evaluation; PPA = project performance assessment; IE = impact evaluation; CPE = country programme evaluation; CSPE = country programme and strategy evaluation.

ESR Ref. No.	*Region Code*[1]	*Country*	*Fragility Status**	*Project Number (GRIPS ID)*	*Project Name*	*Evaluation type*[2]	*Approval date*	*Closing date*	*Total Budget, in US$ M*	*IS Investment Share (of budget), %*
#13	WCA	Mauritania	Not fragile	1100001255	Oasis Sustainable Development Programme (PDDO)	PE/PPA/IE	17-Dec-03	31-Oct-14	11.4	38.4%
#14	NEN	Morocco	Not fragile	1100001338	Rural Development Project in the Eastern Middle Atlas Mountains (PDRMO)	PE/PPA/IE	13-Dec-05	04-Oct-16	26.0	44.1%
#15	WCA	Nigeria	Not fragile	1100001196	Community-based Agricultural and Rural Development Programme (CBARDP)	PE/PPA/IE	12-Sep-01	30-Sep-13	42.9	51.1%
#16	APR	Pakistan	Not fragile	1100001245	Community Development Programme (CDP)	PE/PPA/IE	18-Dec-03	31-Mar-13	21.8	34.2%
#17	ESA	Rwanda	Not fragile	1100001431	Kirehe Community-based Watershed Management Project (KWAMP)	PE/PPA/IE	11-Sep-08	31-Dec-16	42.3	51.8%
#18	NEN	Sudan	Fragile	1100001263	Gash Sustainable Livelihoods Regeneration Project (GSLRP)	PE/PPA/IE	18-Dec-03	31-Mar-13	24.9	39.2%
#19	ESA	Tanzania	Not fragile	1100001166	Agricultural Marketing Systems Development Programme (AMSDP)	PE/PPA/IE	06-Dec-01	30-Jun-10	36.4	32.4%
#20	NEN	Turkey	Not fragile	1100001189	Sivas – Erzincan Development Project (SEDP)	PE/PPA/IE	11-Sep-03	30-Sep-13	23.0	64.8%
#21	APR	Bangladesh	Not fragile	1100001235	Microfinance and Technical Support Project (MFTSP)	CPE/ CSPE	10-Apr-03	30-Jun-11	16.3	30.2%
#22	WCA	Burkina Faso	Not fragile	1100001247	Sustainable Rural Development Programme (PDRD)	CPE/ CSPE	02-Dec-04	30-Jun-14	24.8	33.0%
#23	WCA	Burkina Faso	Not fragile	1100001368	Small-scale Irrigation And Water Management Project (PIGEPE)	CPE/ CSPE	13-Dec-07	22-Feb-17	13.7	46.9%
#24	APR	Cambodia	Not fragile	1100001261	Rural Poverty Reduction Project (Prey Veng and Svay Rieng) (RPRP)	CPE/ CSPE	18-Dec-03	17-Dec-12	17.9	36.5%
#25	WCA	Cameroon	Not fragile	1100001136	Community Development Support Project (PADC)	CPE/ CSPE	23-Apr-02	31-Dec-09	11.8	49.8%
#26	APR	China	Not fragile	1100001478	Sichuan Post-Earthquake Agriculture Rehabilitation Project (SPEARP)	CPE/ CSPE	30-Apr-09	31-Mar-13	30.5	99.1%

ESR Ref. No.	*Region Code*[1]	*Country*	*Fragility Status**	*Project Number (GRIPS ID)*	*Project Name*	*Evaluation type*[2]	*Approval date*	*Closing date*	*Total Budget, in US$ M*	*IS Investment Share (of budget), %*
#27	APR	Nepal	Not fragile	1100001119	Western Uplands Poverty Alleviation Project (WUPAP)	CPE/ CSPE	06-Dec-01	31-Mar-17	24.3	45.2%
#28	APR	Pakistan	Not fragile	1100001182	North West Frontier Province Barani Area Development Project (NWFP BAPD)	CPE/ CSPE	26-Apr-01	31-Dec-08	66.5	45.0%
#29	ESA	Rwanda	Not fragile	1100001222	Umutara Community Resource and Infrastructure Development Project (PDRCIU)	CPE/ CSPE	06-Dec-01	30-Jun-08	20.5	53.5%
#30	APR	Sri Lanka	Not fragile	1100001254	Dry Zone Livelihood Support and Partnership Programme (DZ-LiSPP)	CPE/ CSPE	09-Sep-04	30-Sep-13	27.0	40.0%
#31	APR	Sri Lanka	Not fragile	1100001351	Post-Tsunami Livelihoods Support and Partnership Programme (PT-LiSPP)	CPE/ CSPE	19-Apr-05	30-Sep-10	4.7	100.0%
#32	APR	Sri Lanka	Not fragile	1100001600	Iranamadu Irrigation Development Project (IIDP)[2]	CPE/ CSPE	13-Dec-11	30-Sep-17	22.2	86.8%
#33	NEN	Tunisia	Not fragile	1100001213	Programme for Agro-pastoral Development and Promotion of Local Initiatives in the South-East (PRODESUD)	CPE/ CSPE	05-Sep-02	31-Dec-15	30.2	60.0%
#34	NEN	Tunisia	Not fragile	1100001299	Integrated Agricultural Development Project in the Governorate of Siliana-Phase II (PDAI Siliana II)	CPE/ CSPE	13-Dec-05	31-Mar-16	31.1	76.7%
#35	APR	Vietnam	Fragile	1100001202	Rural Income Diversification Project in Tuyen Quang Province (RIDP)	CPE/ CSPE	06-Dec-01	31-Mar-10	25.9	39.3%
#36	ESA	Mozambique	Not fragile	1100001184	Sofala Bank Artisanal Fisheries Project (SBAFP)	PE/PPA/IE	12-Sep-01	30-Sep-11	29.6	21.1%
#37	NEN	Turkey	Not fragile	1100001492	Ardahan-Kars-Artvin Development Project (AKADP)	PE/PPA/IE	17-Dec-09	31-Mar-18	26.4	51.5%
#38	ESA	Malawi	Not fragile	1100001365	Rural Livelihoods Economic Enhancement Programme (RLEEP)	PE/PPA/IE	13-Dec-07	30-Jun-18	29.2	41.1%

* Fragility status taken from the Special Programme for Countries with Fragile Situations: Operationalizing IFAD's Fragility Strategy (2019). https://webapps.ifad.org/members/wgtf/TFWG8/docs/TFWG-2019-8-W-P-3-Rev-1.pdf.

[1] Also reviewed as a case study (#47 in table "List of case studies"); [2] Also reviewed as a case study (#48 in table "List of case studies").

Source: ESR compilation.

Table A2.2
List of 10 case studies

ESR ref. no.	*Region code*	*Country*	*Fragility status**	*Project number (GRIPS ID)*	*Project name*	*Infrastructure typology*	*Approval date*	*Closing date*	*Total budget, in US$m*	*Infrastructure investment. share (of budget), %*
#40	APR	Bangladesh	Not fragile	1100001647	Coastal Climate Resilient Infrastructure Project (CCRIP)	Market places & value chains Road transport mobility	10-Apr-13	31-Mar-20	150.1	68.2%
#41	APR	China	Not fragile	1100001555	Guangxi Integrated Agricultural Development Project (GIADP)	Road transport mobility Productivity (irrigation/drainage, pastoral water Infrastructure [IS]) Basic needs (drinking water, schools, sanitation, energy)	13-Dec-11	30-Sep-17	96.9	30.1%
#42	ESA	Burundi	Fragile	1100001105	Rural Recovery and Development Programme (PRDMR)	Road transport mobility Productivity (irrigation/drainage, pastoral water IS) Basic needs (drinking water, schools, sanitation, energy)	28-Apr-99	31-Dec-10	34.2	44.2%
#43	LAC	Brazil	Not fragile	1100001335	Rural Communities Development Project in the Poorest Areas of the State of Bahia (Gente de Valor)	Productivity (irrigation/drainage, pastoral water IS) Basic needs (drinking water, schools, sanitation, energy)	20-Apr-06	30-Sep-13	60.5	0.0%
#44	NEN	Georgia	Not fragile	1100001760	Agriculture Modernization, Market Access and Resilience Project (AMMAR)	Market places & value chains Productivity (irrigation/drainage, pastoral water IS)	01-Sep-14	31-Jul-21	35	2.9%
#45	WCA	Chad	Fragile	1100001446	Pastoral Water and Resource Management Project in Sahelian Areas (PROHYPA)	Productivity (irrigation/drainage, pastoral water IS)	15-Sep-09	30-Sep-15	22.6	0.0%
#46	WCA	Gambia	Fragile	1100001643	National Agricultural Land and Water Management Development Project (NEMA)	Road transport mobility Productivity (irrigation/drainage, pastoral water IS) ENRM (environment and natural resource management) (Sustainable management of water bodies)	10-Dec-12	30-Dec-20	76.6	77.5%
#47	APR	Madagascar	Not fragile	1100001318	Project to Support Development in the Menabe and Melaky Regions (AD2M)	Road transport mobility Water transport mobility Irrigation/drainage	20-Apr-06	30-Jun-16	23.5	32.3%

ESR ref. no.	*Region code*	*Country*	*Fragility status**	*Project number (GRIPS ID)*	*Project name*	*Infrastructure typology*	*Approval date*	*Closing date*	*Total budget, in US$m*	*Infrastructure investment. share (of budget), %*
#48	APR	Sri Lanka	Not fragile	1100001600	Iranamadu Irrigation Rehabilitation Project (IIDP)	Productivity (irrigation/drainage, pastoral water IS)	13-Dec-11	30-Sep-17	29.3	65.9%
#49	APR	Philippines	Not fragile	1100001485	Irrigated Rice Production Enhancement Project (IRPEP) of the Rapid Food Production Enhancement Programme (RaFPEP)	Irrigation/Drainage management Market Linkages Value addition (other) Irrigation/Drainage IS	17-Dec-08	30-Jun-17	17.6	8.5%

* Fragility status taken from the Special Programme for Countries with Fragile Situations: Operationalizing IFAD's Fragility Strategy (2019): https://webapps.ifad.org/members/wgtf/TFWG8/docs/TFWG-2019-8-W-P-3-Rev-1.pdf.

Key results of e-survey

Figure A3.1
Profile of respondents

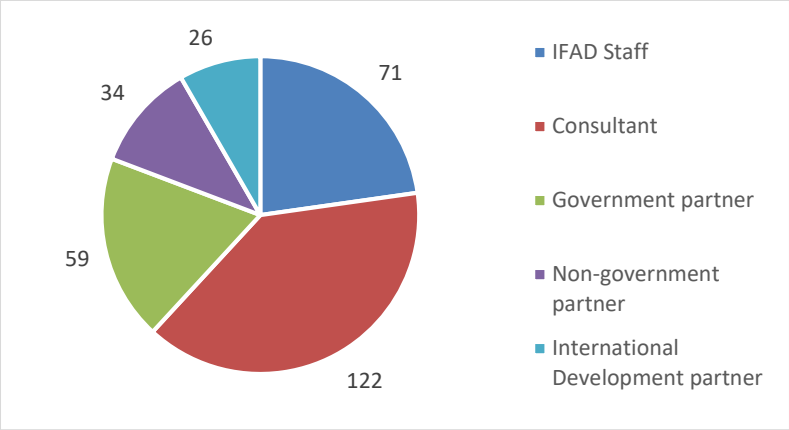
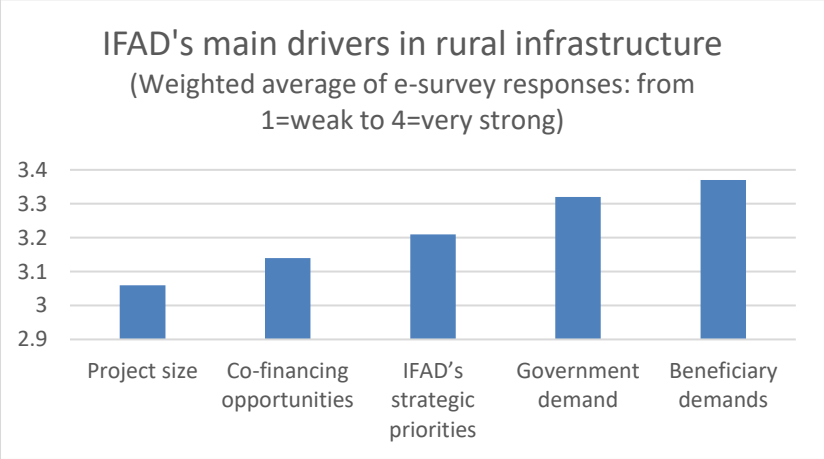
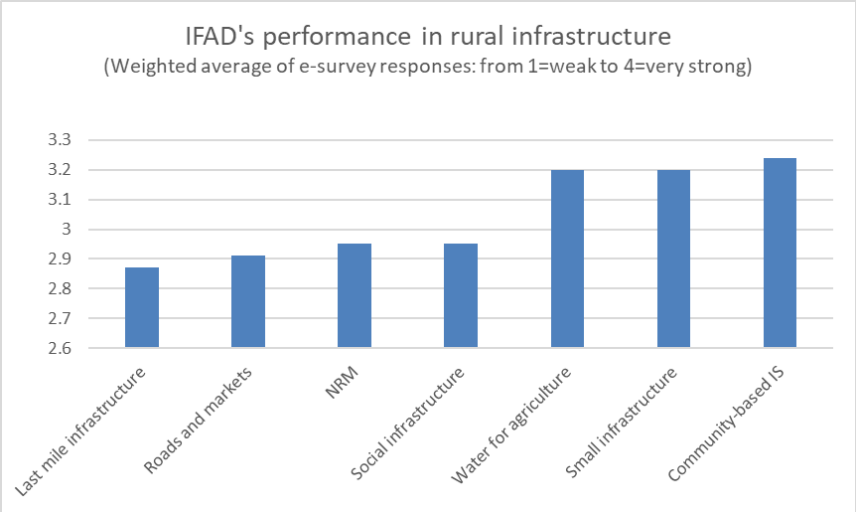


Figure A3.2
How strong are the following drivers for IFAD's investments in infrastructure?



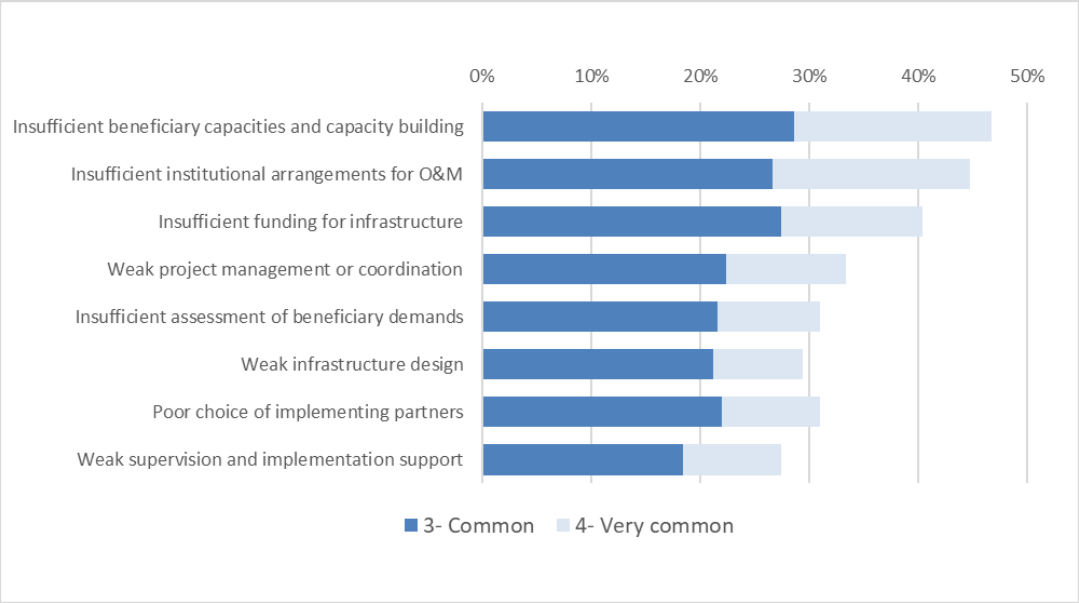
Source: ESR e-survey (n=306 answers).

Figure A3.3
How would you rate IFAD's performance in providing the following types of infrastructure?



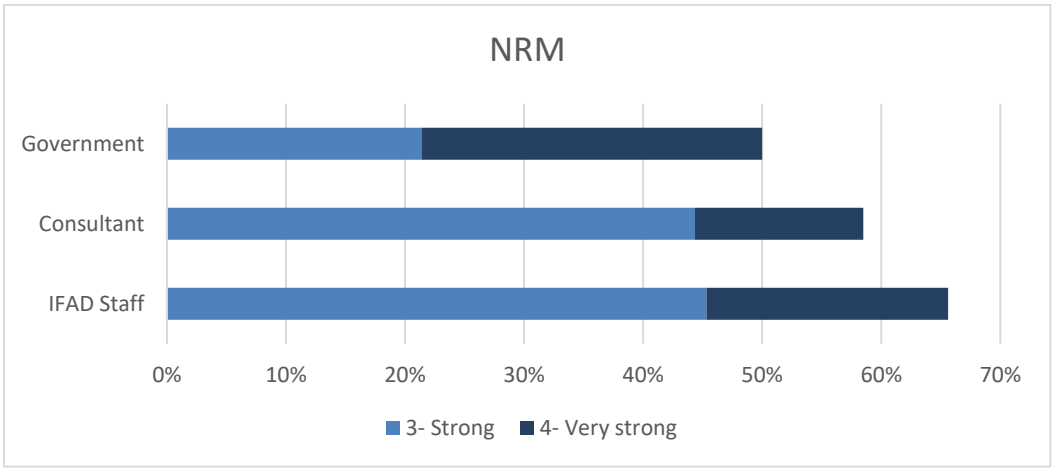
Source: Evaluation Synthesis Report e-survey (n=277 answers)

Figure A3.4
How common are the following issues in IFAD supported projects?

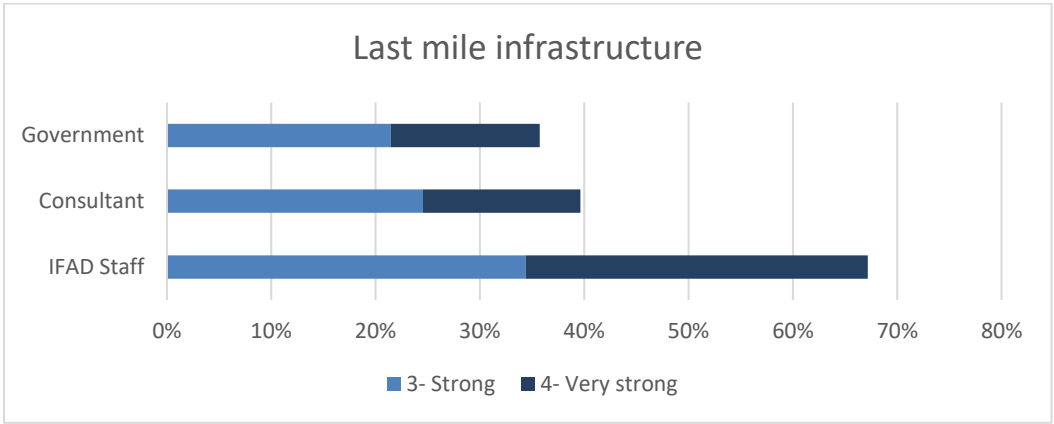


Figures A3.5.a and A3.5.b
How would you rate IFAD's performance in providing the following types of infrastructure? Differences in perceptions by respondent group

A3.5.a



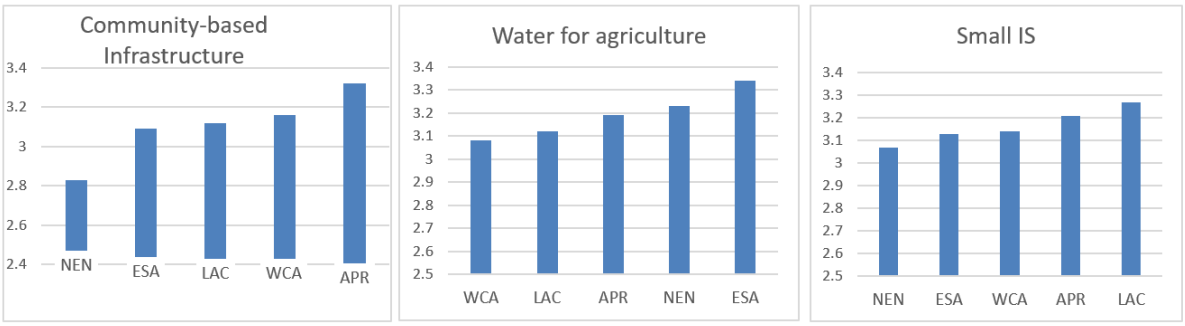
A3.5.b



Note: Only strong and very strong responses are shown; all responses include 'don't know'. Responses are only shown for categories where differences were statistically significant [t-value >1.96; n= 300+]).

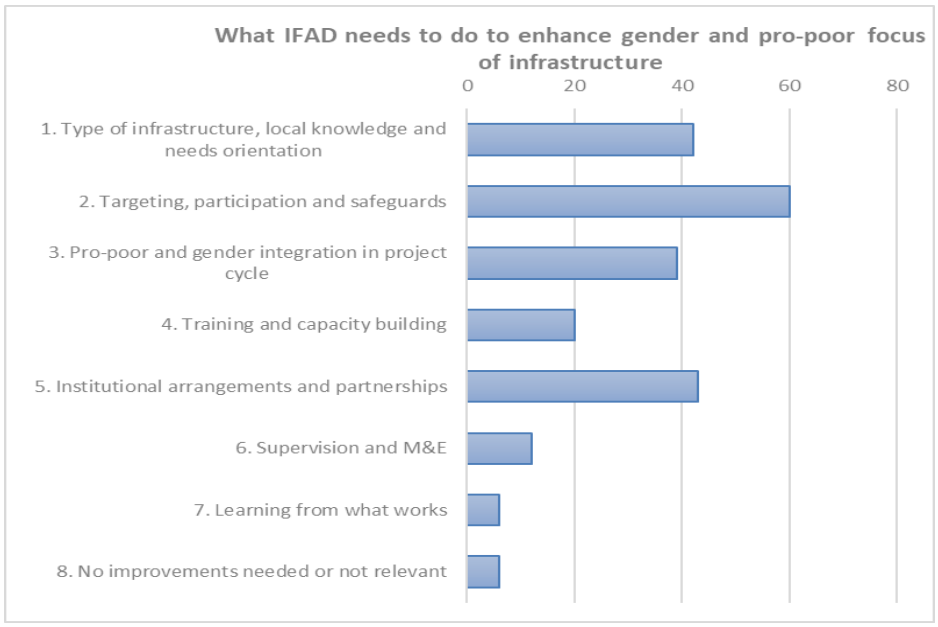
Source: ESR e-survey.

Figure A3.6
How would you rate IFAD's performance in providing the following types of infrastructure? (weighted average by regional division)



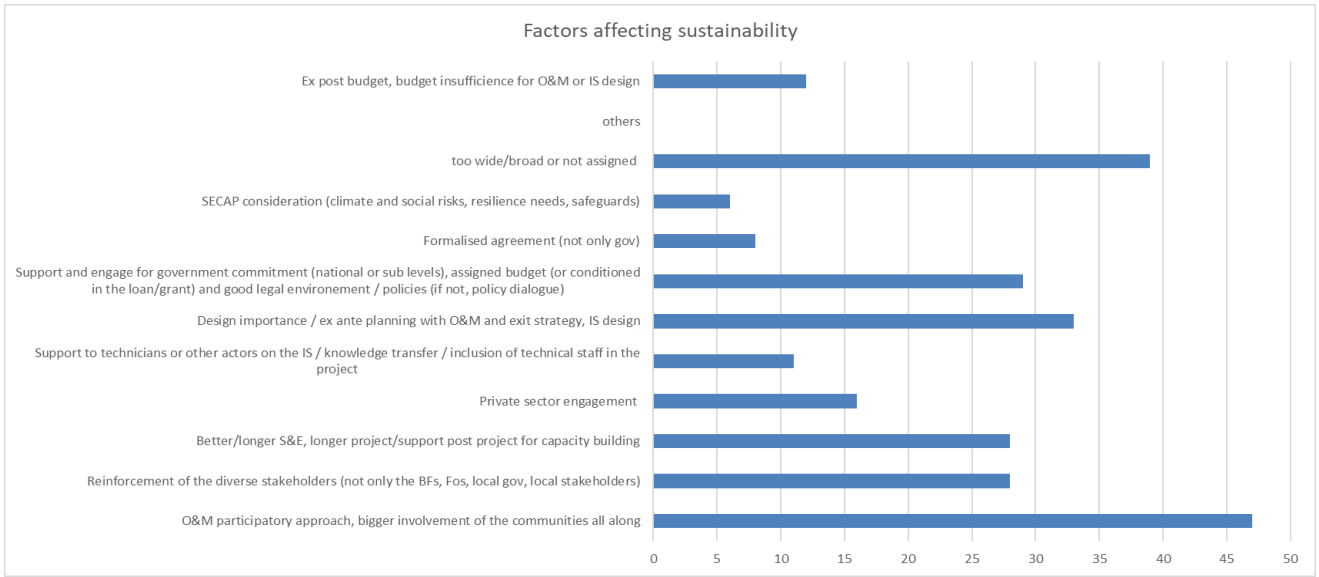
Source: ESR e-survey.

Figure A3.7
Responses on suggested needs for improving gender and pro-poor focus of infrastructure



Note: M&E - monitoring and evaluation.

Figure A3.8
Responses for factors affecting sustainability



Supporting tables for chapters I, II, III, and IV

Table A4.1
Project types (sample of 35 qualitatively-reviewed projects and 10 *case studies [in italics]*)

Project type/ **project size (***total project amount***)**	**Community-Driven Development (CDD) projects (with community Community-Driven Funds [CDF])** (7 projects) *[1 case study]*	**Community-based projects (Community-Based Development [CBD])** (11 projects) *[3 case studies]*	**Production and market oriented projects** (12 projects)	**Specialized infrastructure - super heavy infrastructure project (>70%)** (5 projects) *[4 case studies]*
Small *(<US$20M)*	#13 Mauritania	#23 Burkina Faso #25 Cameroon	#3 Bhutan #7 Georgia *[#49 Philippines*]	#31 Sri Lanka
Medium small *(US$20M-30M)*	#24 Cambodia	#6 DRC #9 Laos #10 Laos #11 Madagascar #12 Mauritania *[#45 Chad*] *[#47 Madagascar]*	#1 Armenia #2 Azerbaijan #8 Kenya #29 Rwanda #38 Malawi	#32 Sri Lanka #37 Turkey *[#48 Sri Lanka*]
Medium large *(30-US$40M)*	#35 Vietnam #16 Pakistan # 27Nepal	#14 Morocco #18 Sudan (*drinking water*) #22 Burkina Faso *[#42 Burundi*]	#20 Turkey #30 Sri Lanka #36 Mozambique *[#44 Georgia*]	
Large *(40-US$65M)*	#17 Rwanda *[#43 Brazil]*		#19 Tanzania #33 Tunisia	#34 Tunisia
Very large *> US$65M(>98)*	#15 Nigeria	#28 Pakistan		#26 China [#40 Bangladesh] [#41 China] *[#46 Gambia*]

Table A4.2
Presence of infrastructure activities in project types (average)

	CDD	***CB***	***Prod& Market***	***IS-heavy***
ASSET USERS GROUP DEVELOPMENT	0.1	0.1	0.2	0.0
COMMUNITY DEVELOPMENT	0.3	0.2	0.1	0.0
DRINKING WATER AND SANITATION	0.9	0.6	0.4	0.4
ENERGY	0.4	0.3	0.1	0.2
FINANCE	0.1	0.2	0.0	0.0
HEALTH	0.4	0.4	0.1	0.0
IRRIGATION INFRASTRUCTURES	1.0	0.8	0.7	0.6
IRRIGATION MANAGEMENT	0.1	0.0	0.1	0.0
LITERACY AND HOUSING	0.7	0.5	0.1	0.4
LIVESTOCK AND FISHERY	0.4	0.3	0.5	0.6
MARKET PLACES	0.1	0.3	0.6	0.2
POST-HARVEST	0.1	0.0	0.5	0.2
SUSTAINABLE LAND MANAGEMENT	0.6	0.3	0.2	0.4
TRANSPORT	0.9	0.7	0.9	0.8
VALUE ADDITION	0.4	0.2	0.2	0.2

Table A4.3
Infrastructure Investments by sub-component type (in %) from 2001 to present (from IFAD Fifth to Eleventh Replenishment cycles [IFAD5-IFAD11]) in millions US$

Sum of investment	*IFAD5*	*IFAD6*	*IFAD7*	*IFAD8*	*IFAD9*	*IFAD10 FAD11*		*IFAD5-11*
Row labels								
Access to markets								
Market linkages	1.5	2.1	4.1	4.2	4.7	4.1	6.4	**4.4**
Market places	1.2	1.5	12.8	12.0	8.5	13.1	20.1	**11.5**
Road transport mobility	21.3	35.1	35.3	25.4	15.1	16.9	11.8	**20.7**
Value addition (crops)	< 0.1	2.2	< 0.1	8.8	1.9	4.1	7.6	**4.1**
Value addition (dairy)					< 0.1			**< 0.1**
Value addition (other)	0.7		0.1	0.2	0.5	2.2	0.5	**0.7**
Water transport mobility				1.2				**0.2**
Environment, natural resources and climate								
Climate change adaptation		0.1		1.2	7.7	13.3	12.4	**6.5**
Sustainable land management	3.5	6.8	3.6	2.3	1.1	6.7	4.0	**3.5**
Production sectors								
Animal husbandry	4.1	9.9	3.5	4.8	6.6	3.51		**4.3**
Aquaculture production				0.1	1.3	< 0.1	1.4	**0.6**
Aquaculture technology		< 0.1	2.4	0.2		2.9		**0.9**
Fisheries technology	0.1			0.8	1.9	0.7		**0.8**
Irrigation/drainage Infrastructure	38.5	14.4	25.2	29.7	10.3	18.1	20.7	**20.6**
Irrigation/drainage management	1.5	3.46	0.6	0.9	33.1	2.3	6.2	**10.0**
Livestock post-harvest	0.4	< 0.1	0.7	2.7	2.8	5.2		**2.2**
Post-harvest control/storage	1.2			2.0	0.5	3.1	1.5	**1.3**
Sustainable water management	0.6	1.4	1.0	0.1	0.4	0.5	4.9	**1.2**
Water harvesting/storage	0.6			0.5	0.1			**0.1**
Social services								
Basic drinking water supply	8.3	4.7	2.4	1.37	1.5	2.6	0.1	**2.1**
Energy infrastructure	0.06		3.6	< 0.1	0.1		1.4	**0.7**
Housing	< 0.1	7.1						**0.4**
Literacy	8.4	3.4	0.9	1.0	0.3	0.2		**1.1**
Sanitation and waste management	1.2	4.6	0.5	0.4	0.7		0.2	**0.7**
Policy & Institutions								
Asset users group development	6.8	3.3	3.3	0.1	0.8	0.6	0.8	**1.4**
Grand total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Sustainable Production, Markets and Institutions Division database accessed April 2020.

Table A4.4
NRM and Climate Change Adaptation (CCA) relevant infrastructure based on typology from the IFAD infrastructure desk

Sub-category	Hard infrastructure
Sustainable land management	Activities at non-plot level, including protection, rehabilitation and conservation of land: terraces, bunds, land clearing etc. Activities that conserve rainfall or prevent erosion, desertification and land desertification
Sustainable water management	Protection, rehabilitation and conservation of water bodies, swamps, wetland etc. Watershed management, planning and development Groundwater management, monitoring and recharge
Water harvesting and storage	Rainwater harvesting Construction of reservoirs, storage tanks, dams, ponds etc.
Drinking water supply	Rural water supply schemes using hand-pumps, catchments, gravity-fed systems, rainwater collection and fog harvesting Storage tanks and small distribution systems typically with shared connections/points of use
Energy (small-scale)	Supply to rural communities through hydro-electric, solar, wind, geothermal, biofuels and waste management (biogas etc.) Energy supply and use for households: energy-efficient cook stoves, biogas) *[Energy for production, such as pumping for irrigation, processing (rice parboiling plant), and storage (cold storage), falls under other categories]*

Source*:* Chitima, Mawira. Sharing knowledge on rural infrastructure and SECAP – ESA. PowerPoint presentation. IFAD/PMI.

Table A4.5
Contributions by natural systems (forests, floodplains, and soils) to clean, reliable water supply, protection against floods and drought or provision of other ecological/ecosystem services

Service	Gray infrastructure component	Green infrastructure components
Irrigation and drainage	Dams, reservoirs, aqueducts, pump stations, canals, bunds, drainage systems	Improve upstream soil and water management to avoid flooding, erosion and damage to downstream irrigation Increase soil water storage capacity to reduce irrigation requirements Store flood waters in river flood plains and thereby reduce embankment requirements
Hydropower	Reservoirs and power generation	Reduce sediment inflows from watersheds and extend life of reservoirs and power
Water supply and sanitation	Reservoirs, wells, pipe networks, treatment plants	Improve source water quality, enhance water safety and reduce treatment requirements
Coastal flood protection	Embankments, groynes, sluice gates	Decrease wave energy and storm surges through mangrove forests and thereby reduce embankment requirements

Combining “green infrastructure” with traditional “gray infrastructure,” such as dams, levees, reservoirs, treatment systems, and pipes, could provide next generation solutions for climate resilience.
Source: ESR compilation.

Table A4.6
PMI sub-categories included as infrastructure

Categorisation in IFAD dashboard	ESR categorisation
	Sustainable land management
	Climate change adaptation
	Post-harvest losses control/storage
	Aquaculture technology (ponds, post-harvest etc.)
	Fisheries technology
	Animal husbandry (housing, storage etc.)
	Livestock post-harvest (handling and storage)
Irrigation and drainage infrastructure	Irrigation and drainage infrastructure
	Irrigation and Drainage management
	Sustainable water management
	Water harvesting/storage
Road transport mobility	Road transport mobility
Water transport mobility	Water transport mobility
Value addition (crops)	Value addition (crops)
Value addition (fish)	Value addition (fish)
	Value addition (meat)
Value addition (dairy)	Value addition (dairy)
Value addition (other)	Value addition (other)
Market places	Market places
	Market linkages
Asset users group development	Asset users group development
	Basic drinking water supply
	Literacy (incl. schools)
	Sanitation and waste management
Energy infrastructure	Energy infrastructure
Energy management	Energy management
Housing	Housing
	Community development

Note: Grey shaded fields refer to exclusively soft infrastructure investments.

Table A4.7
Co-finance investments infrastructure categories by co-financiers

Organization	Roads	Market linkages/ value addition	Irrigation	Post-harvest	SLM	Livestock	Drinking water & sanitation	Energy	Social (other or combined)	Total number of projects
OFID	Mauritania #12 Rwanda #29 Tunisia #33	Turkey #20 Malawi #38			Burkina Faso #22		Rwanda #29	Armenia #1	(Morocco #14, cancelled)	8 (+1 cancelled, Morocco)
WFP	Laos #10 Cambodia #24 Nepal #27	Laos #9 Sri Lanka #			Rwanda #17					**6**
GEF					Burkina Faso #22, Tunisia #34					**2**
ADB	Pakistan #16		Pakistan #16						Pakistan #16	**1**
AfDB	Tanzania #19	Tanzania #19		Tanzania #19						**1**
EU	Madagascar #11		Mada-gascar #11							**1**
Bilaterals	Sri Lanka #30 Tunisia #34 (AFD), Mozambique #36 (Norway)		Bhutan #3 (SNV), Vietnam #35 (Sweden)			Tunisia #34 (AFD)			Democratic Republic of Congo #6(DSF), Laos #10 (GIZ)	**8**
Domestic cofinancing (by activity, >15%); no. of PF sample projects	9		7		2	2	1	1	3	**18**
Project #s with significant domestic cofinance	#3, 6, 10, 11, 17, 19, 27, 28, 33		#2, 12, 13,18, 23, 33, 34		#28, 34	#18, 20	#27	#26	#6, 10, 15	

Note: Organizations: OFID = OPEC Fund for International Development; WFP = World Food Programme; GEF = Global Environment Facility; ADB = Asian Development Bank; AfDB = African Development Bank; AFD = Agence Française de Développement; EU = European Union; SNV: Netherlands Development Organisation.
Other: SLM = sustainable land management.
Source: ESR portfolio sample.

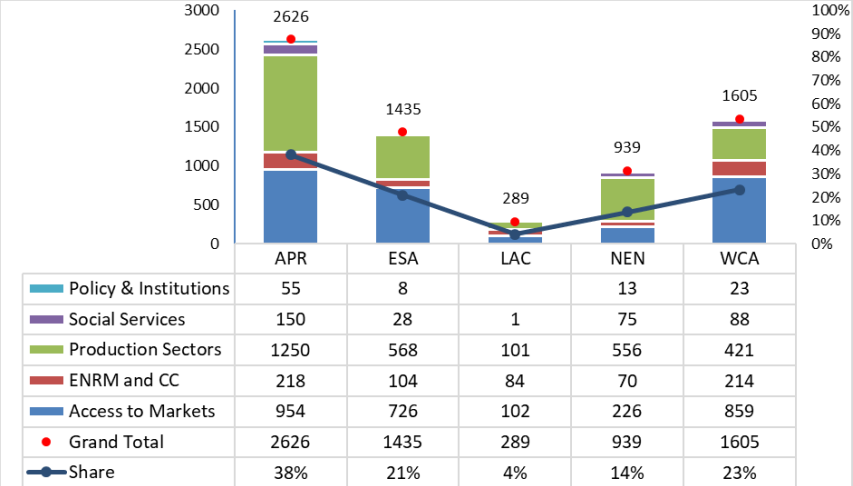
Table A4.8
Performance of co-financed vs. non-co-financed infrastructure activities

Performance indicators	Internationally co-financed project activities	Domestically co-financed project activities (>15 per cent co-finance)
Infrastructure outputs	When project activities are internationally co-financed there are fewer of them that significantly underachieve and fewer that overachieve, there is more concentration in the middle ground	When domestically co-financed there are more infrastructure activities with weaker achievement of outputs
Infrastructure technical quality	No differences	[too few observations]
O&M	Slightly more co-financed infrastructure activities with the highest O&M performance (4), but also slightly more projects that are scored 2	Slightly more co-financed infrastructure activities with the highest O&M performance (4)
Exit and sustainability	Somewhat better with international co-finance (the scores of 3 and 4 add up to 58 per cent compared with 45 per cent for non-co-financed)	Somewhat higher sustainability with domestic co-finance (the scores of 3 and 4 add up to 55 per cent compared with 45 per cent for non-co-financed)
Reaching the very poor	Co-financed infrastructure activities are less likely to reach the poor (but based on relatively few cases with observations)	[too few observations]
Engaging and reaching women	'IFAD only' projects are not better than co-financed ones	Infrastructure activities that include domestic co-finance report slightly higher engagement of women than those without (scores of 3 and 4 add up to 77 per cent compared with 65 per cent for non-co-financed)

Source: ESR compilation.

Supporting charts and figures chapters II, III, IV

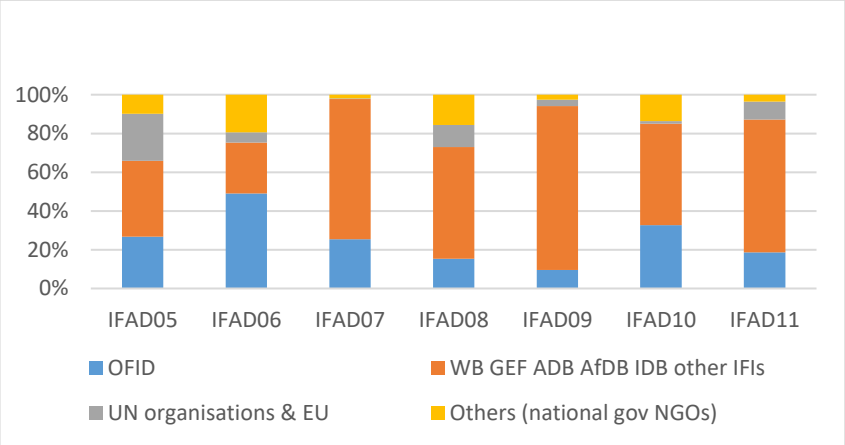
Figure A5.1
Infrastructure Investments by Regions from 2001 to present (IFAD 5-11)



	APR	ESA	LAC	NEN	WCA
Policy & Institutions	55	8		13	23
Social Services	150	28	1	75	88
Production Sectors	1250	568	101	556	421
ENRM and CC	218	104	84	70	214
Access to Markets	954	726	102	226	859
Grand Total	2626	1435	289	939	1605
Share	38%	21%	4%	14%	23%

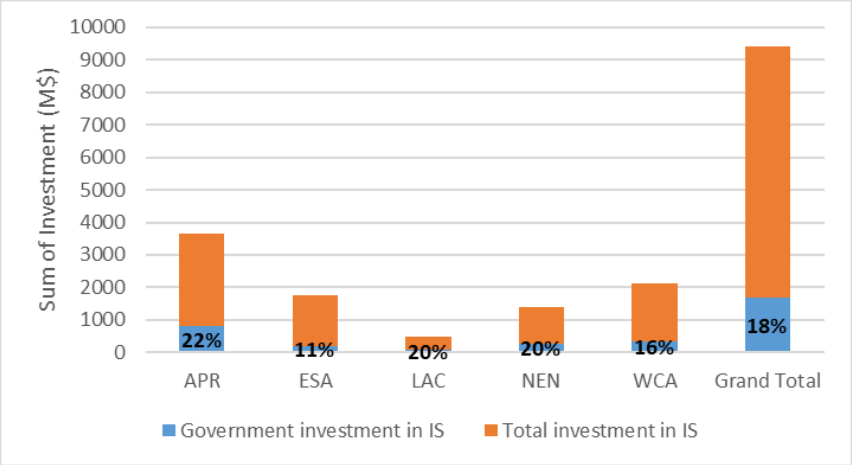
Source: PMI database accessed April 2020.

Figure A5.2
Co-finance infrastructure investment shares by type of cofinancier



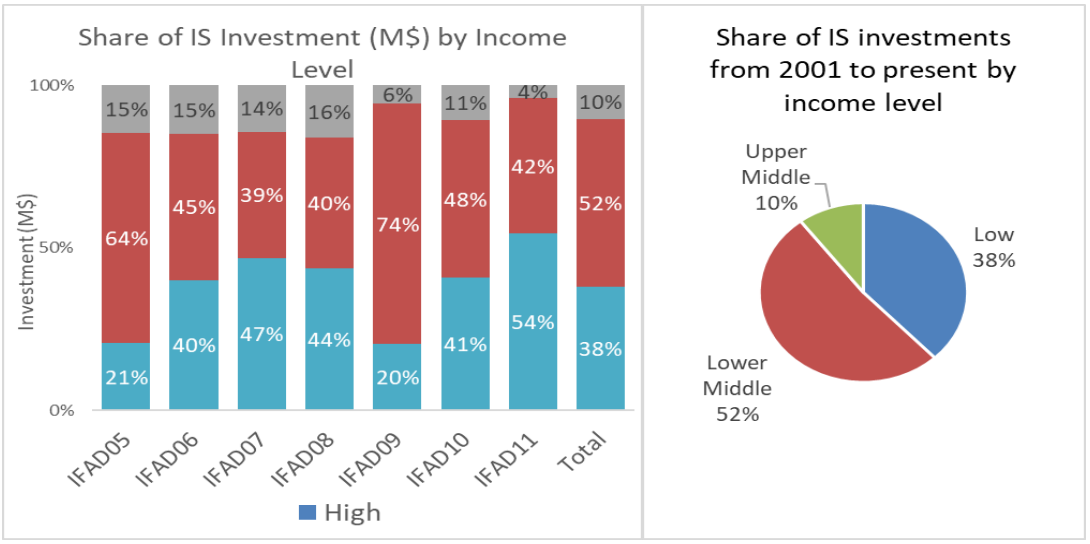
Note: IDB = Islamic Development Bank; NGOs = Non-governmental Organizations.
Source: PMI database accessed April 2020.

Figure A5.3
Government share in infrastructure by region



Source: PMI database accessed April 2020.

Figure A5.4
MICs and LICs: Trend of infrastructure investments shares over time. Total shares 2001-present



Note: MICs = Middle-income countries; LICs – Low-income countries.
Source: PMI database accessed April 2020.

Figure A5.5
IS macro-categories by country type (LIC, lower MIC, upper MIC) (2001-present)

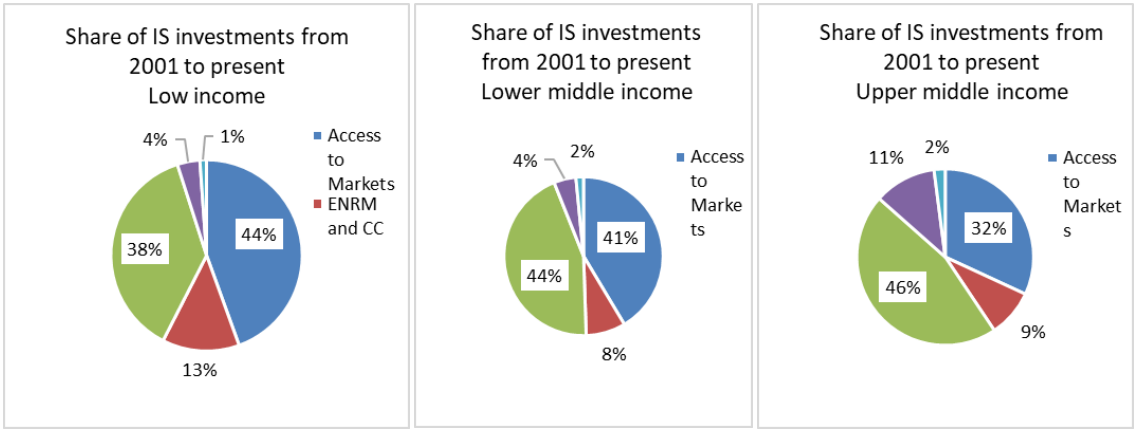
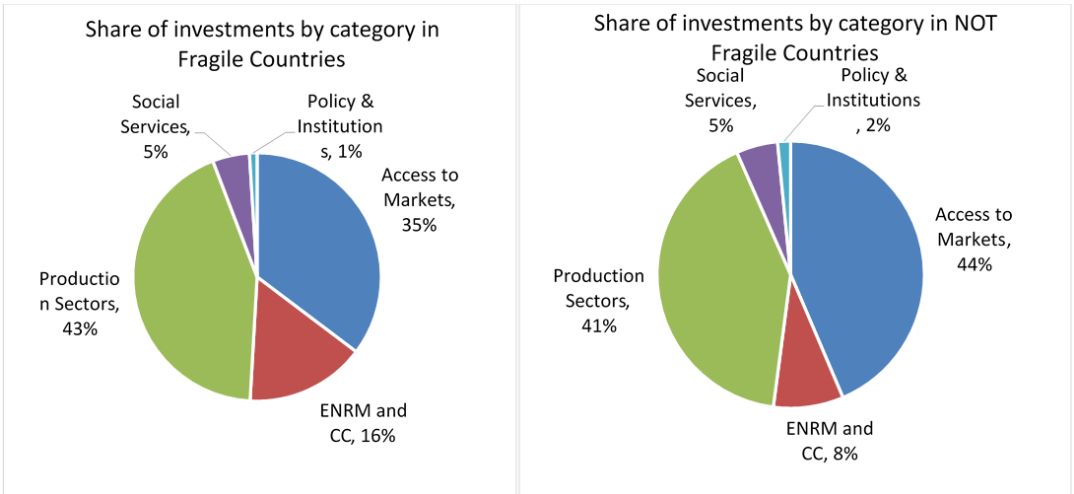


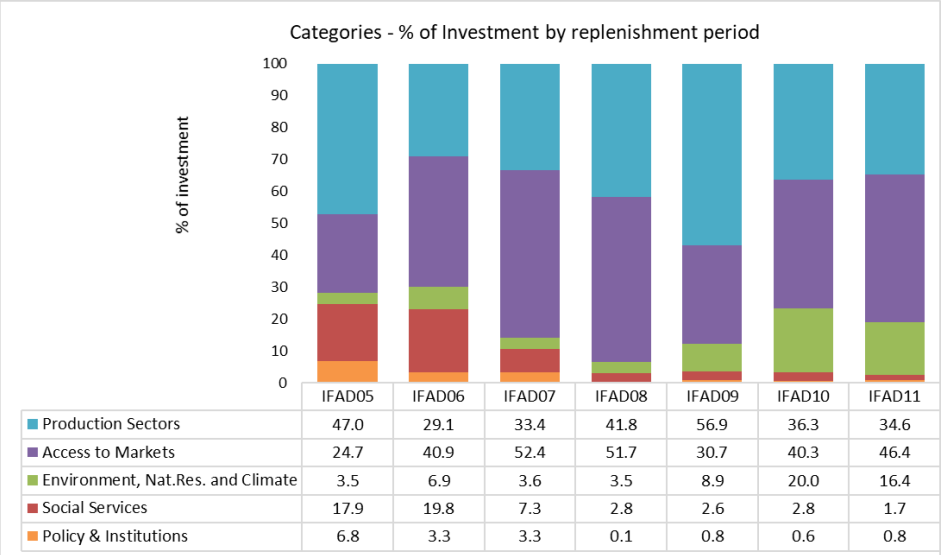
Figure A5.6
Fragility: Shares of infrastructure investment categories for fragile and non-fragile countries (2001-present)

FRAGILE **NON-FRAGILE**



Source: PMI database accessed April 2020.

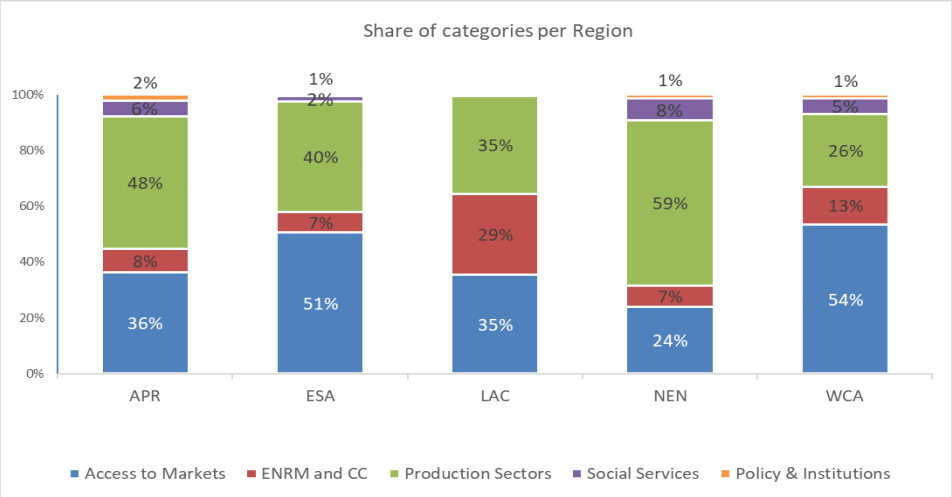
Figure A5.7
Per cent of infrastructure investments by infrastructure category from 2001 to present (IFAD 5-11)



	IFAD05	IFAD06	IFAD07	IFAD08	IFAD09	IFAD10	IFAD11
Production Sectors	47.0	29.1	33.4	41.8	56.9	36.3	34.6
Access to Markets	24.7	40.9	52.4	51.7	30.7	40.3	46.4
Environment, Nat.Res. and Climate	3.5	6.9	3.6	3.5	8.9	20.0	16.4
Social Services	17.9	19.8	7.3	2.8	2.6	2.8	1.7
Policy & Institutions	6.8	3.3	3.3	0.1	0.8	0.6	0.8

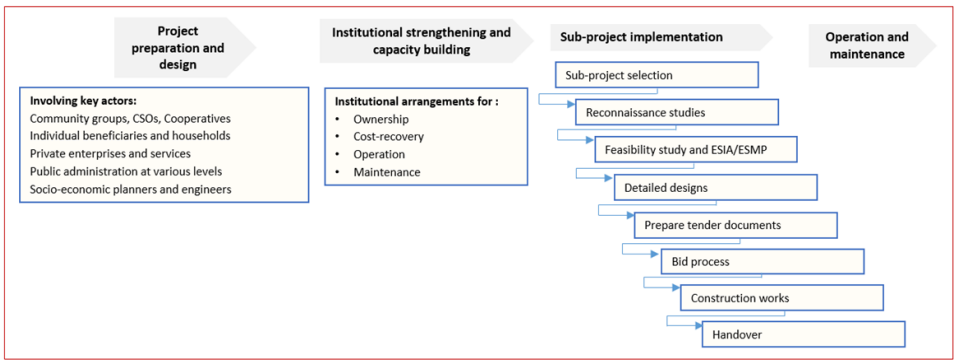
Source: PMI database accessed April 2020.

Figure A5.8
Infrastructure mix by region: Per cent of infrastructure investments by infrastructure category and region from 2001 to present (IFAD 5-11)



Source: PMI database accessed April 2020.

Figure A5.9
Infrastructure phases in the project cycle



Source: ESR compilation.

ESR scoring definitions

Criteria for scoring infrastructure portfolio review indicators

Infrastructure outputs – quantitative achievements vs. targets

This indicator is the percentage of what was achieved vs. what was planned. It should be reviewed by infrastructure category and activity. If targets were changed during mid-term review (MTR) or any other time of implementation percentages of revised targets achieved should be presented but this may depend on the circumstances (PPE, Project Performance Evaluation). Changes in targets during implementation should be noted in the justification.

Technical quality of infrastructure

Scale 1 – 4, from low to high; or: nothing mentioned/insufficient information; n/a

This includes references to the quality of the constructed or rehabilitated infrastructure, in terms of technical standards and quality of the works. Qualitative criteria could include: work being well or not so well executed, in view of common and comparable standards; attention to quality of technical design/feasibility studies; well-established, standard infrastructure design was used; innovative design; infrastructure was adapted or not adapted to beneficiaries' demand and capacities. Please note that technical quality may be a function of infrastructure budgets and unit costs and should be assessed accordingly.

O&M arrangements

Scale 1 – 4, from low to high; or: nothing mentioned/insufficient information; n/a

1 = There are no workable O&M arrangements and major problems exist for IS O&M; 2 = Some O&M arrangements have been established relatively well but with major problems in carrying out O&M responsibilities; 3 = O&M arrangements have been well established, with some day-to-day problems occurring that do not endanger basic O&M; 4 = O&M arrangements have been well established, with demonstrated capacity and willingness to operate and maintain infrastructure.

Prompts: Functional technical and institutional capacities have been built. Clear ownership arrangements are in place. IS user associations, producer associations/coops, individuals, and local administrators have been established and trained. Private sector is involved.

Note: Ratings for O&M in this column can include beneficiaries' financial contributions to O&M or lack thereof.

Exit strategy and sustainability

Scale 1 – 4, from low to high; or: nothing mentioned/insufficient information; n/a

1 = the project had no functional exit and sustainability strategy and/or sustainability was very poor; 2 = the project had an exit and sustainability strategy, but it is likely not to be working (or questionable) and/or sustainability was weak; 3 = the project had an exit and sustainability strategy for continued infrastructure operations, but there are some questions whether it would be working and/or sustainability was marginally satisfactory; 4 = the project had a strong and workable exit and sustainability strategy for continued IS operations and/or sustainability was good.

Prompts: Sustainability refers mainly to functionality and institutional questions of O&M beyond project closure, but also should address technical sustainability, financial/economic sustainability and continuity of operations.

Benefits for IFAD target groups

Very poor households: To what extent are very poor households beneficiaries – i.e. those below poverty level, with very small or no land holdings etc. - reached by the project?

Scale 1 – 4 from low to high; or: nothing mentioned/insufficient information; n/a

Women: To what extent are women beneficiaries – including women-owned households – engaged and reached by the project?

Scale 1 – 4 from low to high; Or: nothing mentioned, not clear, n/a

Infrastructure link with other project activities (relevance)

How well is infrastructure linked with other project activities and components?

Scale 1 – 4 from low to high; or: nothing mentioned/insufficient information; n/a

Some prompting questions could be: How well is infrastructure embedded in overall project objectives? How closely is infrastructure related to community development? Is infrastructure seen from a value chain/market lens perspective: are complementary activities such as market and finance services ensured, either through the project itself or outside the project? In general, what are the synergies? Is the infrastructure rationale clearly defined?

Note: This question does not refer to complementarities of hard and soft infrastructure. Soft infrastructure and capacity building would be covered under other indicators, particularly infrastructure O&M and sustainability

Performance according to activity, project type and institutional models

Performance according to activity

Figure A7.1
Average outputs achieved (as percentage against targets) by ESR category

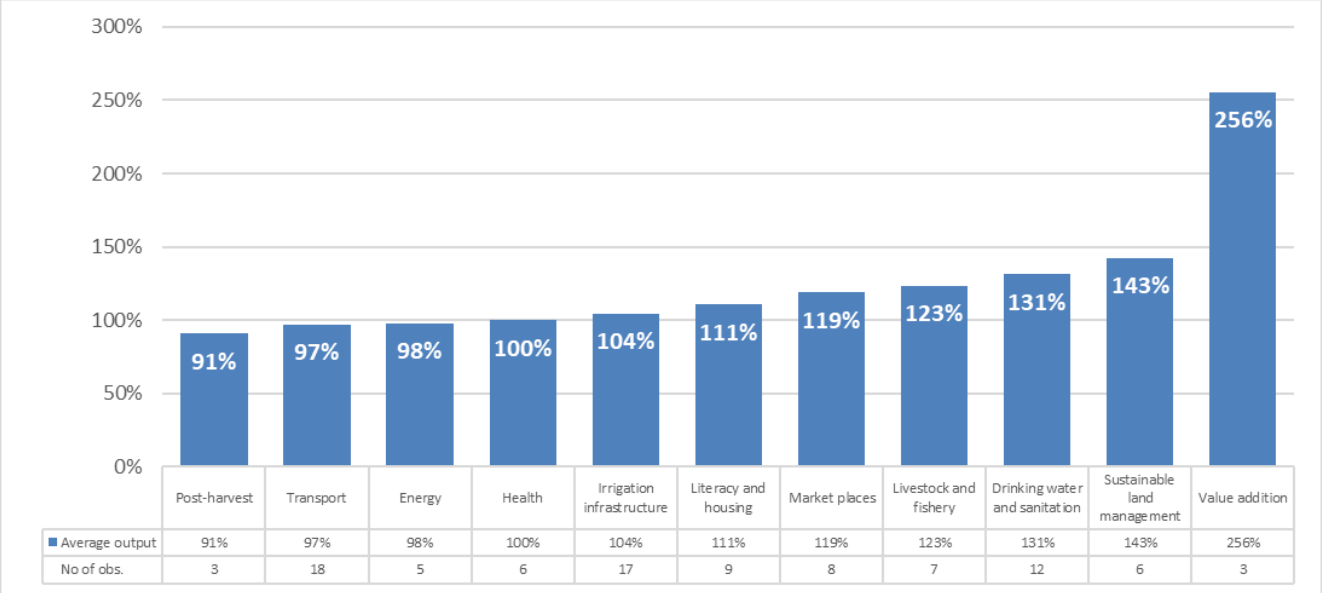


Figure A7.2
IS technical quality (by activity)

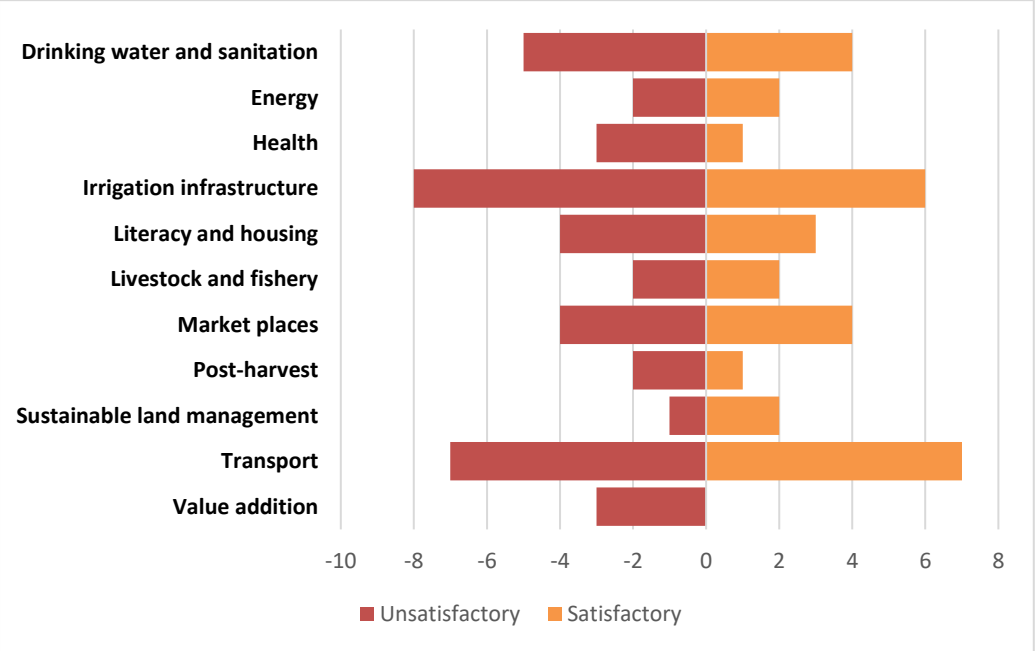


Figure A7.3
IS utilization (by activity)

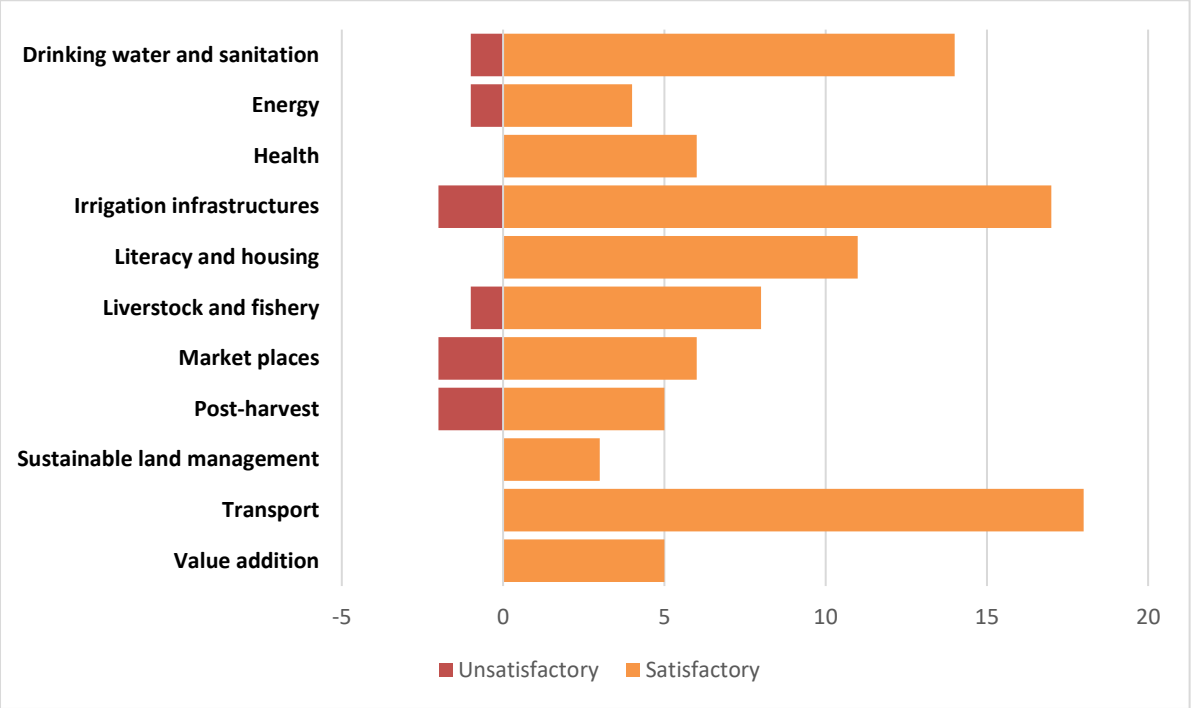


Figure A7.4
O&M arrangements (by activity)

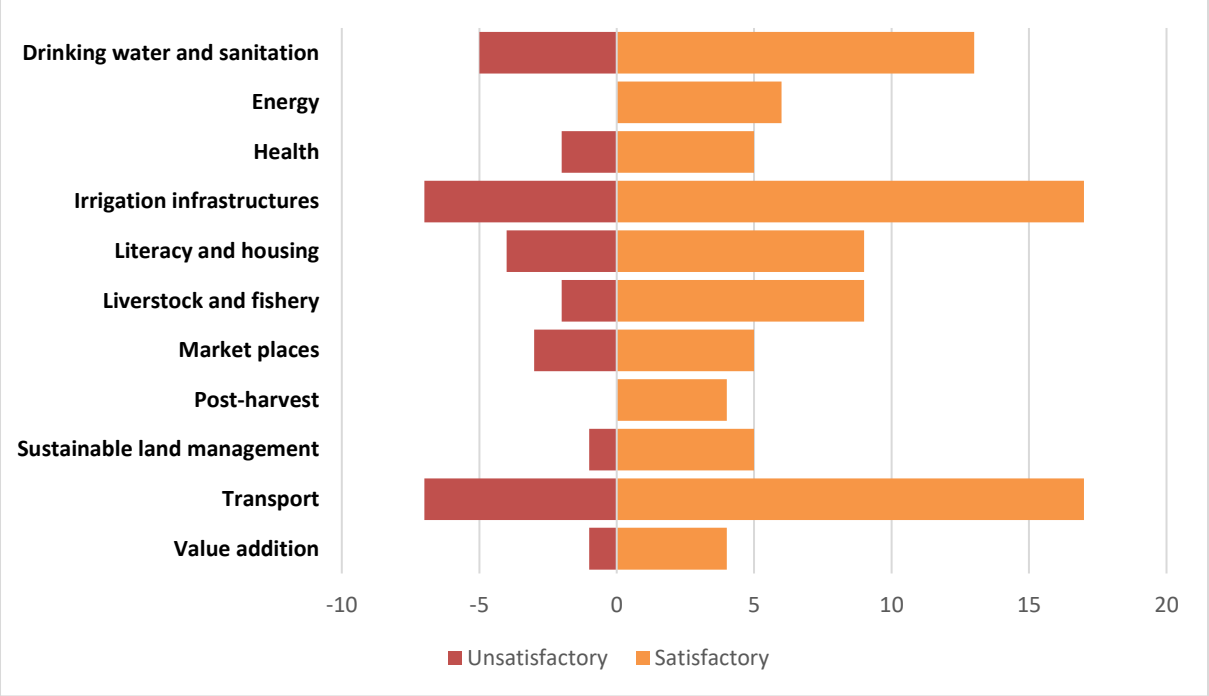


Figure A7.5
Exit and sustainability (by activity)

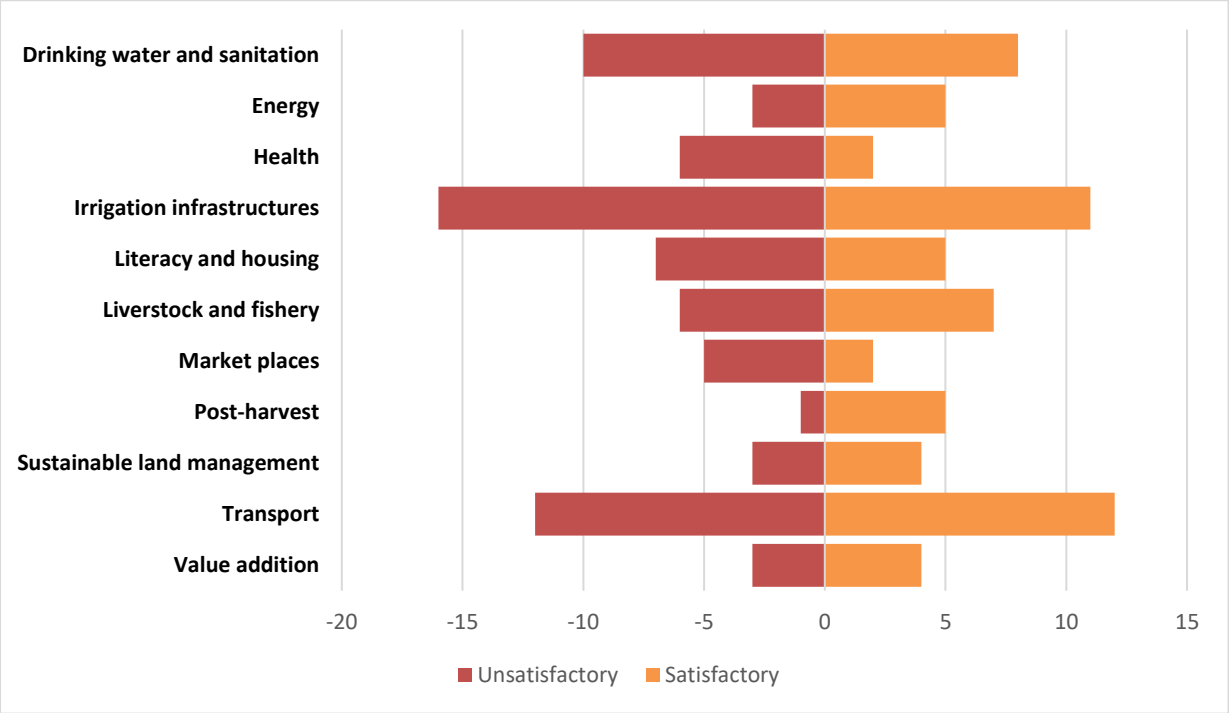


Figure A7.6
Benefits for very poor households (by activity)

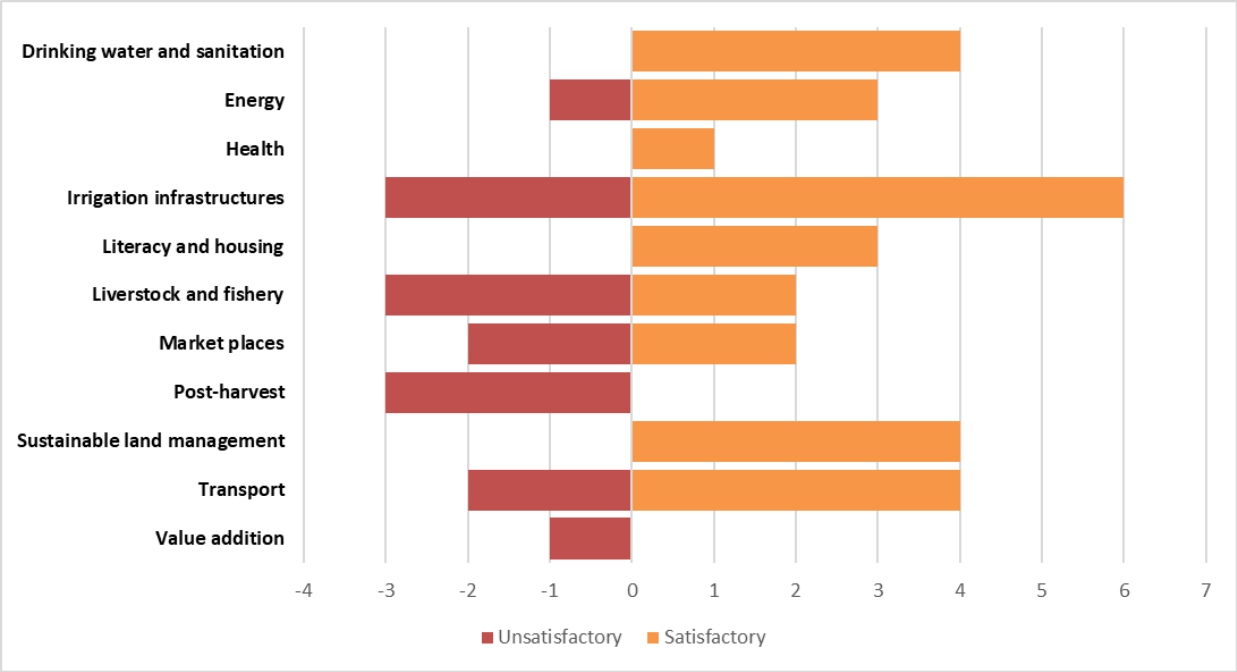


Figure A7.7
Benefits for women (by activity)

Performance according to project type

Figure A7.8
IS outputs – ratings by project type

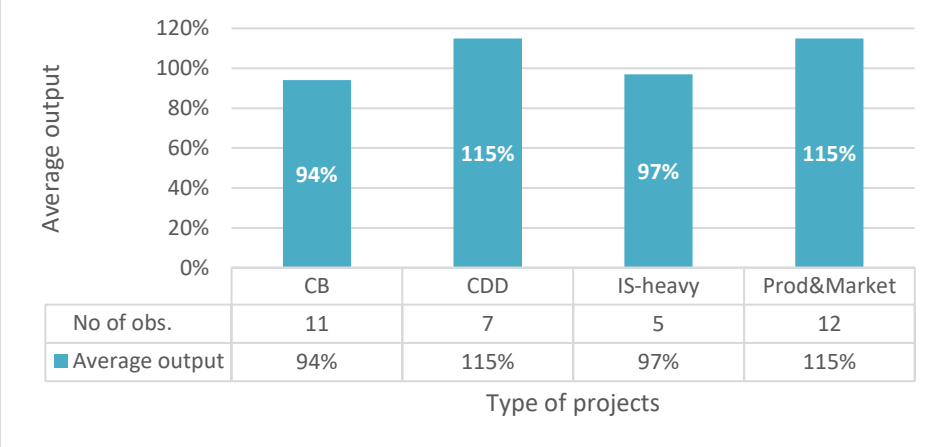


Figure A7.9
IS technical quality (by project type)

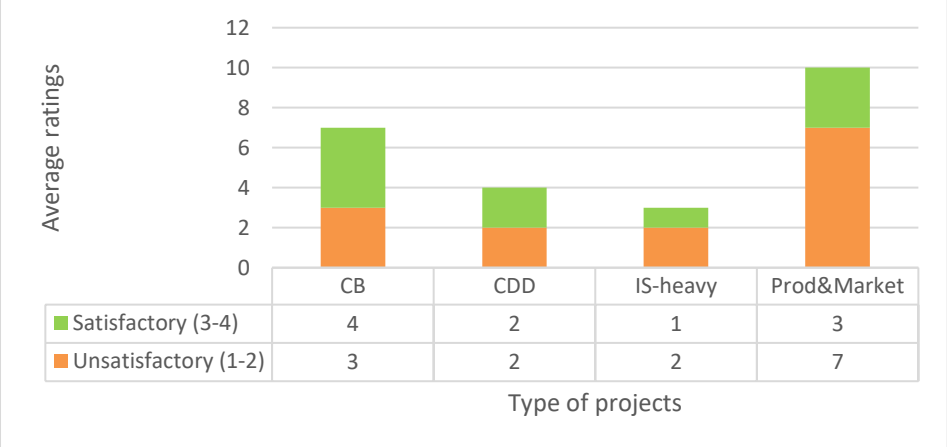


Figure A7.10
Benefits for very poor households (by project type)

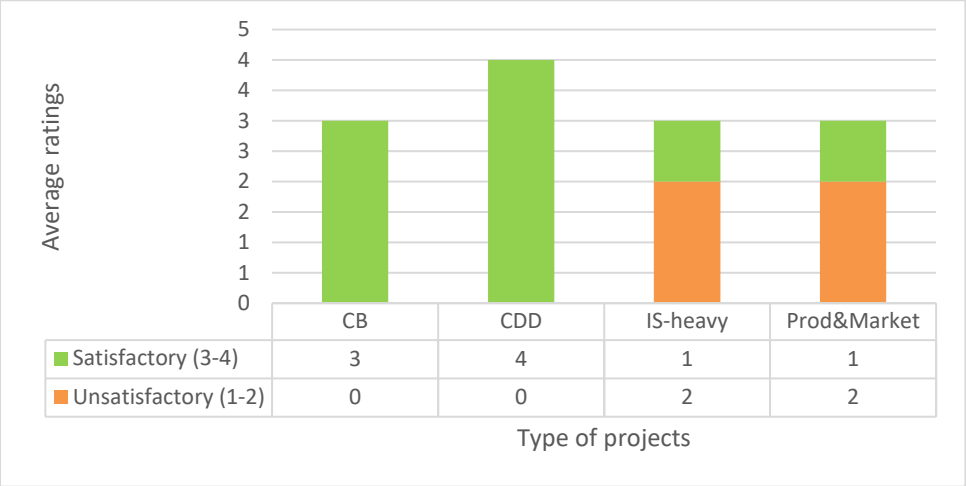


Figure A7.11
Benefits for women (by project type)

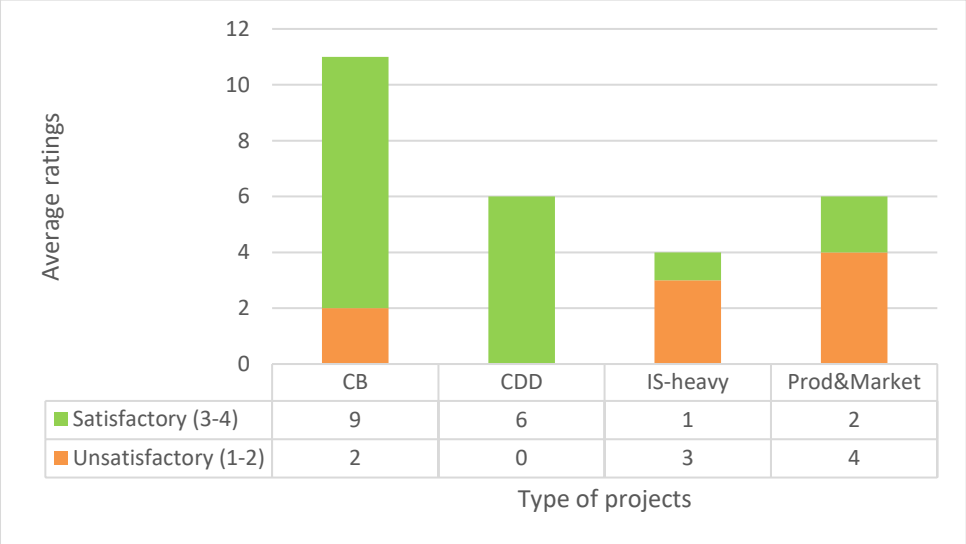


Figure A7.12
O&M arrangements (by project type)

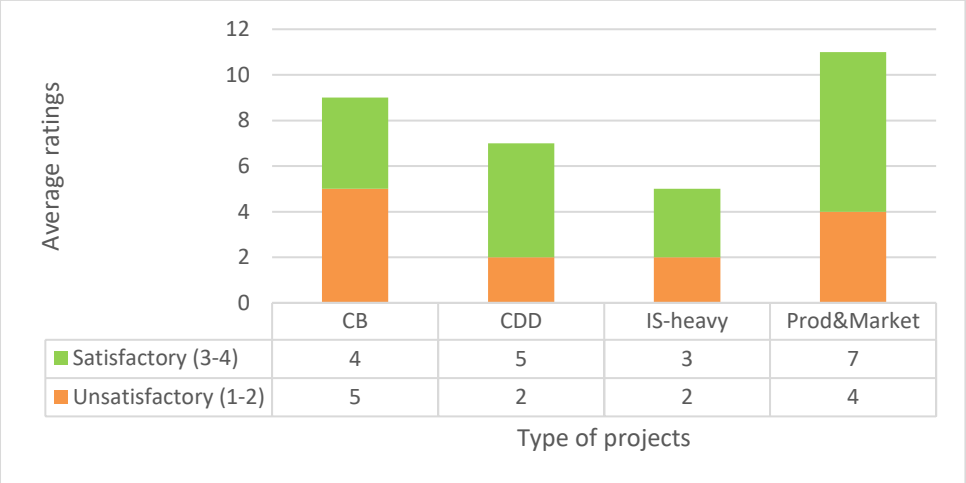
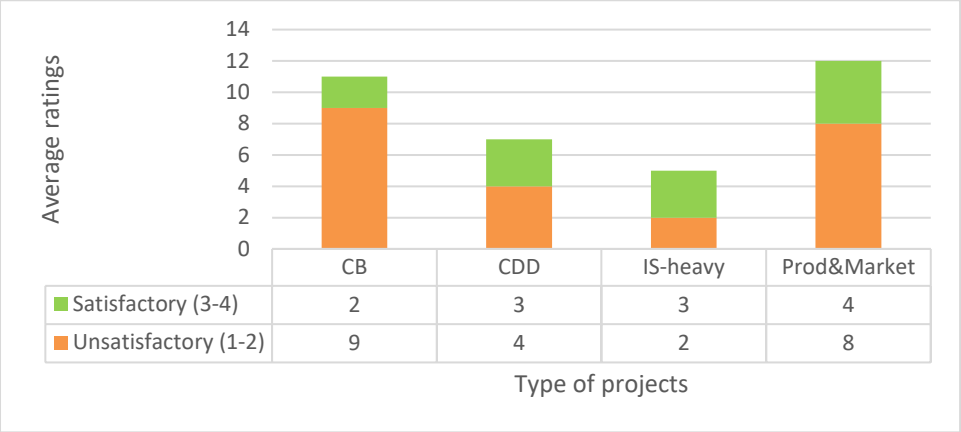


Figure A7.13
Exit and sustainability (by project type)



Performance according to institutional models

Figure A7.14
Ownership models and technical quality (by institutional model)

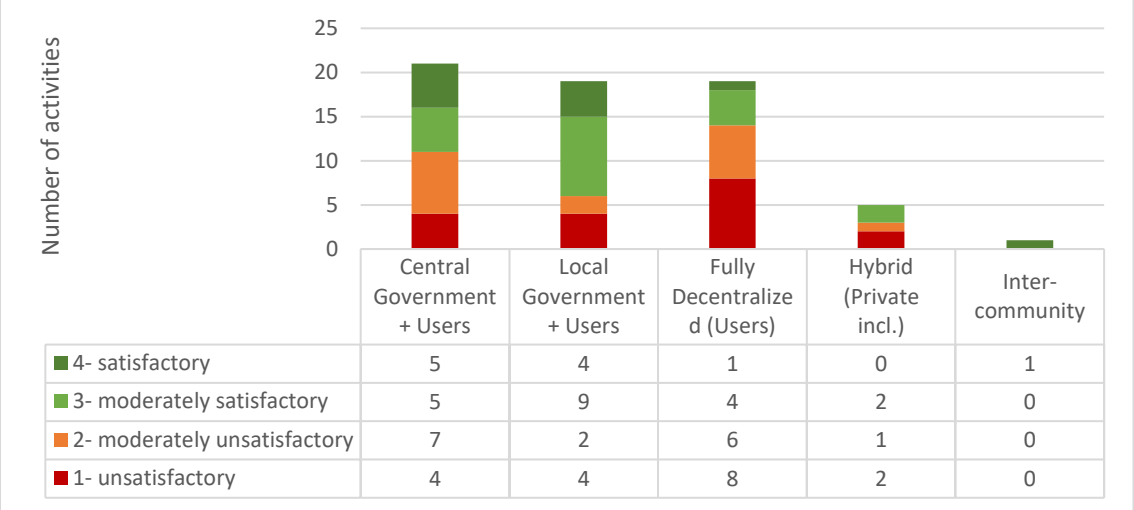


Figure A7.15
Ownership models and IS utilization (by institutional model)

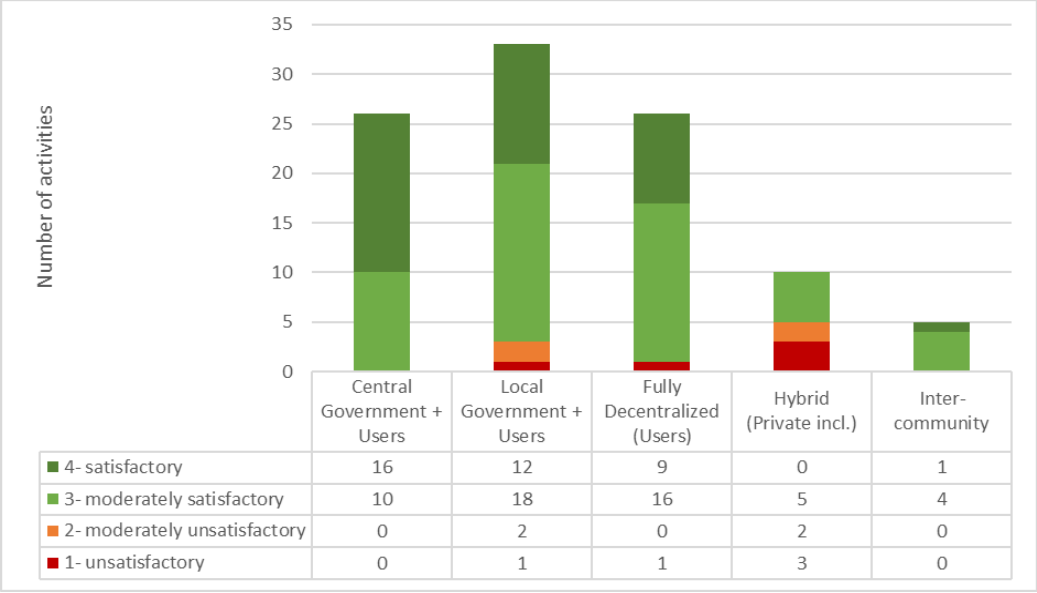
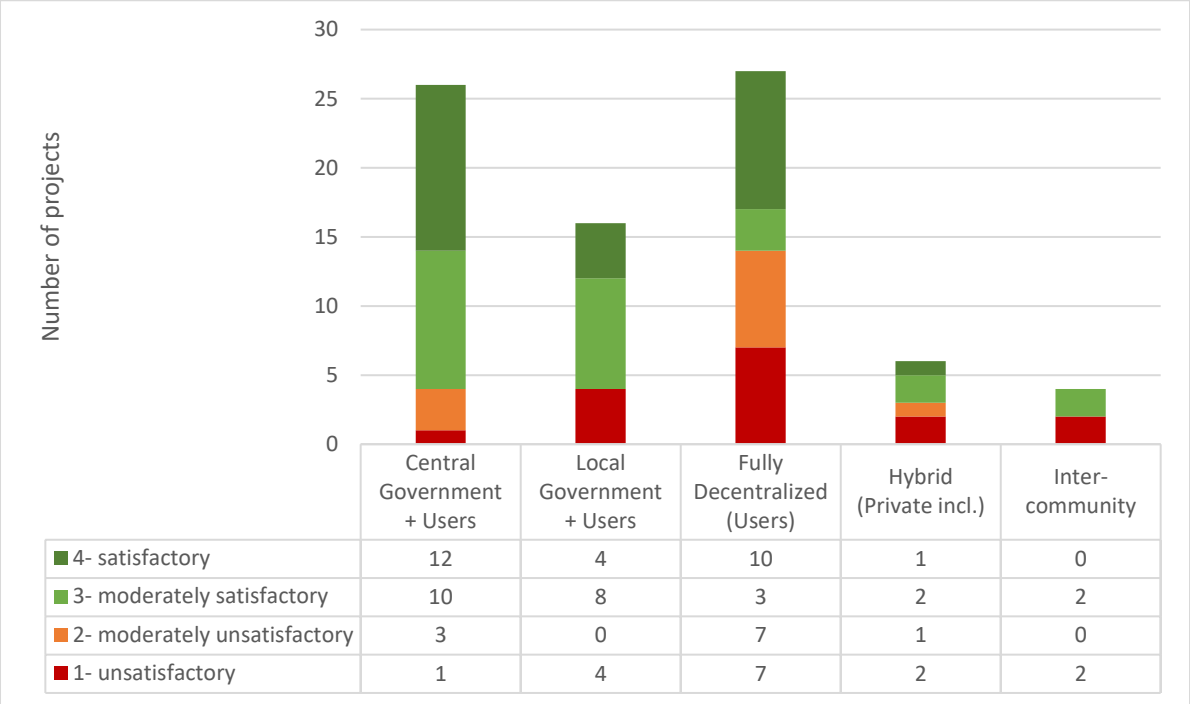
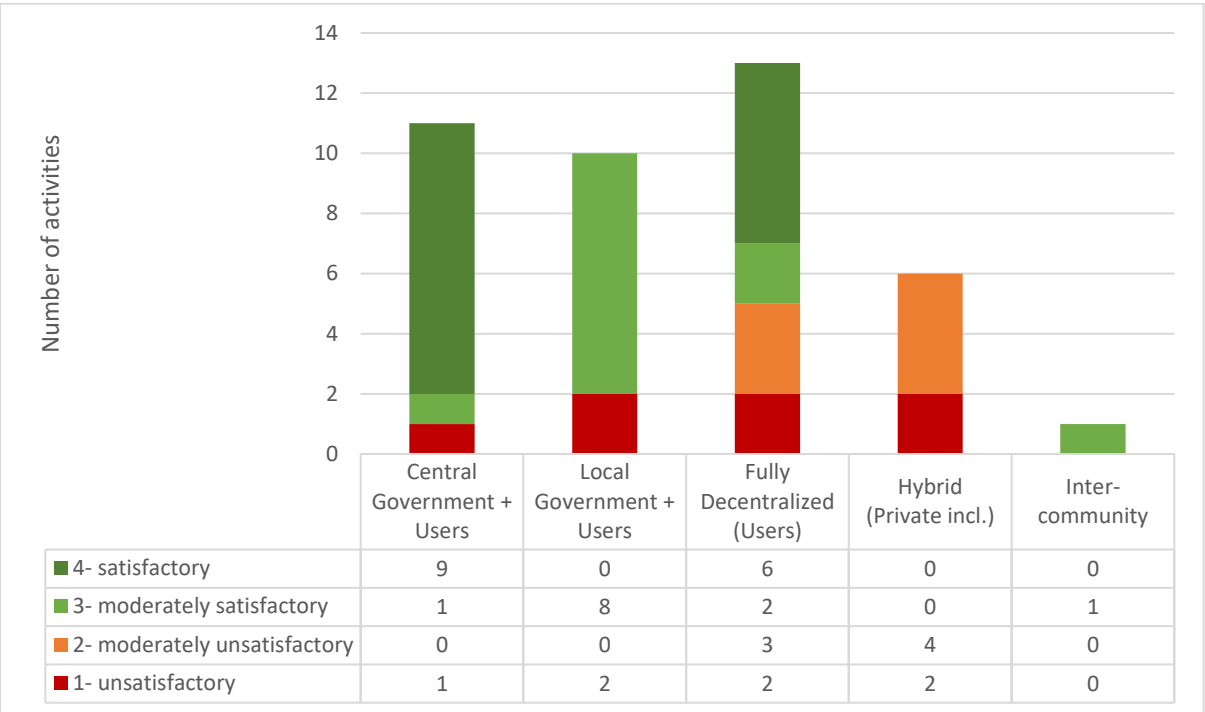


Figure A7.16
Ownership models and women (by institutional model)



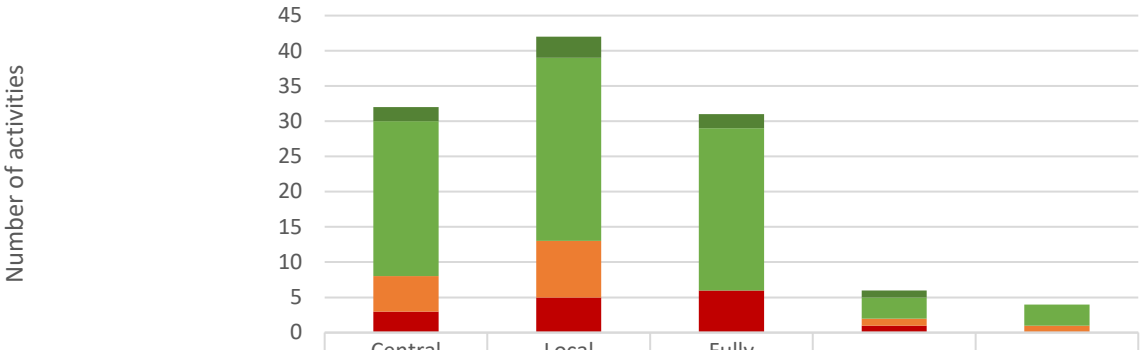
	Central Government + Users	Local Government + Users	Fully Decentralized (Users)	Hybrid (Private incl.)	Inter-community
4- satisfactory	12	4	10	1	0
3- moderately satisfactory	10	8	3	2	2
2- moderately unsatisfactory	3	0	7	1	0
1- unsatisfactory	1	4	7	2	2

Figure A7.17
Ownership models and pro-poor targeting (by institutional model)



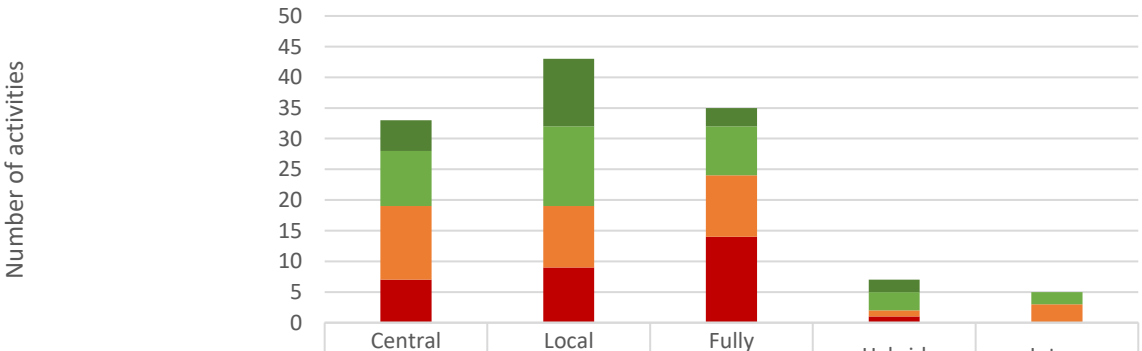
	Central Government + Users	Local Government + Users	Fully Decentralized (Users)	Hybrid (Private incl.)	Inter-community
4- satisfactory	9	0	6	0	0
3- moderately satisfactory	1	8	2	0	1
2- moderately unsatisfactory	0	0	3	4	0
1- unsatisfactory	1	2	2	2	0

Figure A7.18
Ownership models and O&M (by institutional model)



	Central Government + Users	Local Government + Users	Fully Decentralized (Users)	Hybrid (Private incl.)	Inter-community
4- satisfactory	2	3	2	1	0
3- moderately satisfactory	22	26	23	3	3
2- moderately unsatisfactory	5	8	0	1	1
1- unsatisfactory	3	5	6	1	0

Figure A7.19
Ownership models and sustainability (by institutional model)



	Central Government + Users	Local Government + Users	Fully Decentralized (Users)	Hybrid (Private incl.)	Inter-community
4- satisfactory	5	11	3	2	0
3- moderately satisfactory	9	13	8	3	2
2- moderately unsatisfactory	12	10	10	1	3
1- unsatisfactory	7	9	14	1	0

ESR projects with (renewable) energy activities[1]

#	*Country and project*	*Energy type*	*Performance (outputs, operational observations, outcomes)*
1	Pakistan CDP (#16)	Micro-hydro power unit (CDD)	31 schemes, 2% of all CDF schemes, 4% of costs; maintenance committees collect fees
2	Pakistan NWFP BADP (#28)	Micro-hydro power unit	Almost no info available
3	Rwanda KWAMP (#17)	Biogas (CDD)	Innovative, using 'flexi' instead of concrete domes; 451 systems, for cooking and lighting; being up scaled
4	Cameroon PADC (#25)	Solar (community-based project)	4 out of 75 planned installed; poor performance overall
5	China SPEARP (#26)	Biogas	Privately owned; 99% of project budget for reconstruction of HH biogas systems after 2008 Sichuan earthquake;
6	Nepal WUPAP (#27)	Micro hydel (CDD)	96 micro-hydels installed, 7% of all CDF schemes; 20 000 beneficiaries; IRR 73%; reduced kerosene use; longer business hours and study time for children
7	Mauritania (#12)	Bottled gas (community-based project)	Included sales points (depots de gaz); problems with high price and availability of bottles
8	Armenia (#1)	Gas network	Piped gas supplies worked but did not reach the poor due to high prices
9	Mauritania PDDO (#13)	Solar panels for pumps (CDD)	For demonstration in oases. Concerns were expressed in PPE about need for better social, environmental and economic assessments
10	Tunisia PRODESUD (#33)	Solar panels for pumps	22 were installed for livestock wells; but not much demand and scaling-up outside of project; only 25 per cent of planned pumps realized in project phase II
11	Malawi RLEEP (#37)	Solar panels for pumps	20 solar panels installed in milk bulking centres that did not work well themselves. Electrical accidents destroyed all batteries in one centre.
12	Brazil RCDP (#43)	Eco-efficient stoves, bio-digesters	Installation of 727 eco-efficient stoves and 31 bio-digesters (based on animal manure, cassava transformation); reduced drudgery for women
13	Madagascar AD2M (#47)	Solar panels and generators	Marginal role; results not clear

[1] The box on Women and energy in chapter 3 of this ESR refers to the following four projects with positive effects of renewable energy activities on women in Rwanda #17, China #26, Nepal #27 and Mauritania #12.

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Lessons

Chapter II A. Comparative advantage and priorities of other IFIs and development partners

With the increasing importance of other sectors over time, agriculture has fallen a bit by the wayside in other IFIs even though several re-engaged in the sector after the food price crisis of 2007/08, re-emphasized priorities and developed new agriculture and food security operational plans with emphasis on low- and lower-middle income countries (as in the ADB[1]). But staffing, skills and resources were hardly sufficient (ADB, 2018; IDB, 2015) and resulted in relatively low, scattered and often non-satisfactory agriculture infrastructure investments.

For ADB the poor performance of its large irrigation subsector with a 47% successful rate is a concern (ADB, 2018). IDB limited its agriculture infrastructure to some public and private sector support for warehouses and processing plants and to irrigation in poorer countries, such as Haiti (IDB, 2015). And the AfDB saw its largest decline of investments in agriculture (AfDB, 2016), with most infrastructure now going to transport, energy and water and sanitation. At the same time a recent independent evaluation by the World Bank (WB, 2019) on service delivery in the irrigation sector showed weak results as investments continued to focus too much on hard infrastructure and problems continued with sustainability despite years of efforts to transfer management responsibility from public to private organizations (such as WUAs).

The Regional Development Banks clearly remained focussed on infrastructure, with the World Bank having a much more mixed portfolio. For the Regional Banks much of their support for agriculture and rural areas is seen as being provided indirectly, through their main complementary infrastructure sectors of transport, power, telecommunications and water and sanitation (e.g. IDB, 2015). In IDB, 61 per cent of such support was coming through rural roads.

Multi-sector and -partner investments. All agencies concluded that there is urgent need to link single sector or sub-sector focused infrastructure investments with broader development activities, in agriculture and other infrastructure sectors. They offered some concrete ways forward.

A recent report on Future of Food at the World Bank (WB, 2018) emphasized complementary investments into people, institutions and research, including engagement across multiple ministries and agencies, covering water, energy and other infrastructure sectors. The Bank's proclivity to repeat projects with continued single focus in infrastructure hardware rehabilitation should make place to projects that more strongly include climate change, water resource management, agricultural marketing and livelihood projects (World Bank /Independent Evaluation Group [IEG] 2019 Irrigation Evaluation.). There is scope for improving the sequencing and complementarity of projects, potentially with those of other lenders and donors, to address full theories of change in a country context.

For ADB (2018) irrigation infrastructure that was linked well with multiple agricultural and technical advisory support had greater impact, but it could take time for results to come to fruition. For farmers in Bangladesh, in two projects co-financed with IFAD between 2000 and 2017, connectivity to markets, fields, on farm grain storage and mechanization were more important than further investments in water resources. This example supported the case for improving results by combining water delivery infrastructure with extension services and through effective partnerships. For ADB a sector as complex as agriculture, rural development and natural resources warranted a more holistic approach, supported by greater resources and staff skills that can contribute more fully to the complete agriculture value chain. This also meant expanded collaboration and partnerships with recognized centers of excellence to complement current staff resources and supplement skills shortages, and with organizations as IFAD and Food and Agriculture Organization of the United Nations (FAO). For AfDB agricultural water management designs based on an integrated framework that considers trade and market development changes and contexts mattered most for the achievement of desired development results. And while gender mainstreaming was found to be satisfactory and outcomes usually included women they did not always reach them sufficiently, for instance, as projects did not

[1] The ADB developed operational plans for Agriculture, Rural Development and Natural Resources in 2009 and 2015. ADB's Strategy 2030 has Rural Development and Food Security as a priority area.

include learning centres for women (Mali case study; AfDB, 2020 Water management cluster evaluation).

Similar to IDB, lessons learnt from the Agribusiness Strategy 2010 by the European Bank for Reconstruction and Development (EBRD) pointed to the need for better intra-agency organizational processes to coordinate and collaborate among the various infrastructure sector teams to ensure complementarities for rural areas (EBRD 2019-2023 Strategy] and to work more effectively and selectively towards food security results. EBRD lessons also pointed to food security requiring a better definition and theory of change beyond agriculture and for the context of EBRD and its mission. For IDB (2015) agriculture is only one of several ways to achieve food security, most of which suffers from access to food, not availability. IDB should formulate a comprehensive and multi-sector approach to support food security.

Climate resilient infrastructure is a signature programme[2] of the United Nations Development Programme (UNDP). Based on their long-term experience with small-scale, community-based infrastructure, some UN-Agencies, such as UNDP (see also UNDP 2005 evaluation) and the United Nations Environment Programme (UNEP) increasingly, and strongly, build in resilience and other Sustainable Development Goals (SDGs) into design and implementation of rural infrastructure programmes, be it roads, draining, irrigation electricity or water conduits using various climate finance programmes as a vehicle. UNDP also makes a point to help countries adopt policies and implement country-owned programmes to build more resilient infrastructure. In 2018 UNEP launched a platform to promote and support integrated approaches to sustainable infrastructure planning and development, financed by GEF. A stocktaking paper emphasized the centrality of infrastructure to the 2030 Agenda for Sustainable Development, on the importance of systems-based integrated approaches to consider the complex interlinkages between different infrastructure systems, sectors, phases and governance structures, and the broadening of analytical tools routinely used for infrastructure assessments into a tool-box (UNEP 2019).

Monitoring and Evaluation. The importance of quality and functional monitoring and evaluation systems to support project development effectiveness and capture lessons for replication and scaling-up of innovative solutions was mentioned as one of five key lessons in the AfDB cluster evaluation of water management. [AfDB 2020 Cluster Evaluation]. The World Bank 2019 Irrigation service delivery evaluation found insufficient attention to tracking irrigation infrastructure and supportive services throughout the project cycle. Pertinent questions and data issues are whether the improved availability of irrigation water reaches the intended beneficiaries in an adequate, reliable, and flexible manner; and whether the supplied water is used efficiently for its intended purpose. Secondly, the evaluation found the use of innovative M&E technologies lacking from sensors and water flow measurement devices, satellite data and drones linked to cell phones and the internet of things.

Chapter II C. Safeguards

Several IFIs have been grappling with similar safeguards issues as discussed for IFAD in chapter II. Safeguards have recently been evaluated for ADB (2020), AfDB (2019) and IDB (2018). The World Bank incorporated its long experiences in a new set of policies and guidelines for sustainable development in 2017 which covers safeguards.

ADB, AfDB and IDB all reported problems for safeguards at design and during implementation, with environmental and social risk and impact assessments (ESIA) and ESIA management not being well integrated into overall design and project management, incomplete assessments, and failure to consult with affected communities. At the IDB, a study (2017) found that four decades of conflicts related to infrastructure projects were primarily driven by the lack of adequate up-front planning and consultation with potentially affected communities.

In ADB the share of *category A* projects in the portfolio has dropped, partially due to leaving out infrastructure and other components with higher risks streamlined business processes for design left too little time to undertake the necessary assessments. At ADB, safeguards were also not well customized for non-sovereign private sector financing.

Half of the projects in IDB, and many in the other international Financial Institutions (IFIs), used a framework approach which allows to do parts of ESIA during design, without going back

[2] https://www.adaptation-undp.org/small-rural-infrastructure

to the board, for emerging sub-projects that were not fully identified before project approval. For IDB, such frameworks were often too generic to properly guide the selection of sub-projects and preparation of their ESIAs and management plans, and they would have required consistent follow-up during implementation which was often lacking. For this reason, the World Bank 2017 safeguards design paid attention to very clear guidance on the timing, follow-up and design of such ESIAs for sub-projects.

At IDB follow-up and supervision of safeguards were not regular nor are they consistently monitored and reported. Safeguards results were mixed. Safeguards issues were left unattended during implementation because of resource constraints, the concentration of specialized safeguards staff at IDB headquarters, and team leaders limited familiarity with safeguards issues. The IDB evaluation recommended to (i) more consistently identify projects that use a framework approach to safeguards and enforce the multiple works safeguards preparation requirements; (ii) undertake more regular follow-up and field visits of all high and medium E&S impact operations, with particular emphasis on projects for which detailed designs emerge only during implementation; (iii) explore new supervision approaches, including more use of third-party supervision funded with project funds; and (iv) regular safeguards performance and results to become part of the Project Monitoring Report system, updated at least annually.

The AfDB safeguards evaluation concluded that the Bank was generally compliant with its disclosure requirements before Board approval but there were limitations in the use of E&S documents by stakeholders and deficiencies in their archiving. Reporting on E&S covenants and mitigation measures was poor and inconsistent.
The evaluation prioritized in its recommendations the need to mitigate shortcomings in effective implementation of the AfDB's safeguards systems across the project cycle, among others through (i) providing more safeguards resources to manage E&S across the project cycle; (ii) establishing systematic cross-support linkages between the teams dealing with E&S safeguards, climate change, and gender; (iii) developing an integrated and automated management information system across the project cycle and resume safeguards compliance reviews and audits; (iv) strengthening safeguards reporting to sharpen the focus on delivery and results; and (v) reinforcing the knowledge and awareness of internal and external stakeholders on the safeguards requirements and launching initiatives with other development partners to jointly organize capacity building in safeguards performance.
ADB has a large body of safeguards experts, with 124 [!] safeguards staff positions in 2018. But safeguards reporting requirements, degrees of autonomy and oversight are decentralized to various ADB departments. The ADB safeguards evaluation found a lack of safeguards oversight and consistent application across ADB and recommended to up-date the oversight structure and reporting lines to have more consistent safeguards application across ADB.

The analysis at ADB, IDB and World Bank saw an urgent requirement to work more with borrowers to strengthen country ESIA capacities and systems which was challenged by scarce resources in the past. For ADB and IDB, the roles of the Bank and its clients in ESIA have become blurred, particularly in implementation, and IDB recommended to differentiate more clearly between Bank and borrower responsibilities. Importantly, this includes proper arrangements and clarity of liability by governments and funding agencies. IDB also identified frequent capacity constraints and lack of knowledge on the borrowers' side about how E&S issues were managed and applicable IDB safeguards and recommended targeted capacity building and an incremental approach of using borrower's management systems of environmental and social issues. On the other hand, he AfDB found rather limited results and opportunities in its project operations to support broader E&S safeguards country capacities and suggested to focus on project specific interventions.

The World Bank saw a critical role for early engagement with government and full government ownership. It used its convening ability, financial instruments and intellectual resources to ensure that environmental and social considerations are reflected not only in projects but also in sector strategies, operational policies and country dialogues. The ADB safeguards evaluation recommended to assess necessary staffing to deliver the safeguards implementation framework, strengthen their skills and empower them, also in view of working more strategically and pragmatically with borrowers. A similar recommendation was made by the IDB.

Field case studies from the IDB evaluation showed that safeguards issues can be adequately addressed during project implementation, even if not all the E&S analyses and related consultations were completed to required standards before loan approval— if a clear framework and timetable are established to guide remaining work, sufficient project funds are set aside to handle safeguards issues and there is close follow-up by the Bank during implementation. In sum, the report recommended that IDB should rebalance its focus on up-front procedural requirements with effective implementation for results and associated budgets.

Ch. III / IV. Performance and major performance factors / sustainability

The recent **AfDB cluster evaluation of water management** in nine projects (AfDB 2020) found that the Bank's interventions, mostly in irrigation, were relevant and achieved positive results, but had a number of design weaknesses which led to outputs and outcomes being considerably lower than expected.

On the institutional side, limited outcomes reflected primarily the inadequate capacity of water user associations to manage water resources adequately and claim ownership, due to low financial base, poor organization and management including of service charges and revolving loans, and take-over by individuals or groups of individuals of critical water supply and subsequent destabilization of systems. The evaluation found little evidence of adequate facilitating and engaging in partnerships with beneficiaries or private sector.

To mitigate these gaps the evaluation called for an enhanced formal framework to identify key stakeholders and their roles and responsibilities. Such a framework needs to pay attention to three challenges. First, water groups, cooperatives and associations that played a key intermediary role for efficient infrastructure functioning depended in their capacity on the nature of their partnerships with ministries and local governments. Adequate support needs to be ensured. Secondly, a careful selection of private entities and service providers was necessary to better work with farmers. Investments in building their capacity and adapting procurement procedures considerably helped to succeed with private sector and PPP contributions. And third, the evaluation found only very limited and insufficient partnerships and involvement of NGOs and civil society organizations in water management, clearly a missed opportunity.

On the technical side the evaluation found that limited outcomes were mainly caused by insufficient development of tertiary canals, incomplete land development for irrigation and quality of preparatory studies and design, and lack of complementary production inputs. Altogether, the time and efforts required for the planned scale of activities in these agricultural water management projects was often poorly estimated. Moreover, as summarized by the AfDB comprehensive evaluation for infrastructure in general (AfDB 2016 Comprehensive Evaluation of the Development Results [CEDR]), infrastructure projects tended to benefit more from expert input, for instance into procurement plans by involving consultants and design engineers. But the Bank often focused on transactional compliance with ineffective or variable use of procurement resources. Country supervisions often had shortcomings in team composition to mobilize the necessary expertise to fix the issues, especially in infrastructure.

Sustainability. Financial and economic viability was the main factor limiting infrastructure sustainability at the AfDB (AfDB 2016 CEDR). Smaller projects in states with fragile situations in agriculture, social, and water and sanitation were the worst performers. Examples of good practice existed across sectors with projects setting in place conditions such as fees for using the infrastructure built, and national authorities taking ownership and responsibility including budgets for maintenance. A credible cost-recovery strategy and sound governance improvements are key for ensuring accountability for efficient service delivery by the service providers (AfDB 2020 Cluster - key lesson). Among others, fair representation of water users, use of local services and decentralization of authority at the local level would be necessary. Broad political, institutional and regulatory frameworks are required for support of water user groups.

Sustainability was also the lowest rated criterion of agriculture projects in the ADB [ADB 2018 Agriculture Evaluation]. Referring a bit more to environmental sustainability, ADB did not well take into account the medium- to long-term availability and reliability of the water resource, nor were wider basin-water availability upstream and downstream well considered.

The World Bank irrigation service delivery evaluation (2019) was very critical of the adequacy of policy reforms in many countries to promote financial sustainability of irrigation schemes

and to ensure adequate O&M and a service delivery perspective. Past World Bank assessments highlighted the urgency of policy reforms to promote financial sustainability, 'but to no avail'. Neglect of system O&M for public irrigation schemes has led to what is appropriately described by the practice as "design, neglect, and rebuild".

Some international development agencies introduced more or less detailed concepts and check-lists for better sustainability of infrastructure, such as IDB (IDB 2018 Guide to sustainable infrastructure). For instance, the IDB framework and guidance for infrastructure sustainability identified 66 criteria that should be addressed during project preparation and design to ensure that economic and financial, environmental, social and institutional sustainability are achieved over the entire life cycle of an infrastructure investment, including private sector engagement and attention to climate resilience.[3] This IDB effort is too new to yield any results yet. But the effort itself draws attention to the absolute necessity to consider sustainability at project design, to avoid above trap of 'design, neglect and rebuild'.

Chapter IV A. Institutional and policy issues

Decentralisation of transport. The IFAD Rural Roads, Travel and Transport (RTT) study (2008) commented on the significant shortage of planning and implementation capacities for RTT, particularly in local governments. The decentralised bodies were often plagued by the lack of technical capacities and funding. Only in rare cases, if at all, had decentralisation been accompanied by a major capacity building programme and the allocation of sufficient funds for road improvement and maintenance. Where the decentralisation process was well advanced, staff had greater awareness of the pivotal role of RTT in local development. Still, local governments often remained too much focused on the roads themselves, while the issues of transport means and services were either overlooked or ignored.

The study also observed that the Ministry of Agriculture as IFAD's main partner is normally not directly responsible for RTT and neither is it competent to handle RTT programmes and issues. This is an important reason why a majority of rural roads is either not included in the Government's regular maintenance programmes, or is given a low priority in the partner country investment plans. Initiatives are required to achieve greater cooperation and knowledge exchange between the transport and agricultural sectors.

Decentralisation of irrigation management. FAO conducted a systematic review of decentralisation of irrigation management (2007). Over many years Governments across the world embarked on a process of irrigation reform meant to tackle the increasing demands on irrigated agriculture and to enhance its performance while coping with both liberalization and participatory strategies. Among reforms in irrigated agriculture, irrigation management transfer (IMT) has appeared as the most important and far-reaching reform thus far. The concept of IMT normally refers to the process that seeks the relocation of responsibility and authority from the controlling government agencies managing irrigation systems (under the public sector) into the hands of NGOs, such as WUAs, or other private-sector entities.

According to this study irrigation management transfer has partially achieved this objective of reducing government costs. However, government disengagement from financing irrigated agriculture has been hampering the provision of some basic support services in the agriculture sector. It underestimated the need by WUAs and irrigation agencies for substantial and prolonged capacity development. Many irrigation agencies simply lacked knowledge and experience in assisting WUAs to organize and manage their new responsibilities and support their capacities related to technical or organizational aspects. Furthermore, the institutional frameworks for WUAs are often only partial at the time of policy adoption and need to be elaborated further over time.

Chapter V. Rural poverty impact of roads

Many studies have pointed to a positive impact of rural roads and transport on poverty reduction. All evidence from a 2016 systematic review by the UK Department for International Development a strong direct relationship between rural transport infrastructure, reduced transport costs and increased traffic volumes was showed. Over time this led to higher employment, income and consumption, and an expansion of the agricultural sector. The strongest impacts were experienced in countries and regions with low road densities. Some

[3] Please refer to tables 1–4 in the report that present sustainability criteria across the four principles at the project preparation and design phase.

studies indicated that feeder roads (basic access roads) provided greater social welfare gains than higher standard gravel or paved roads.

Health impacts were generally positive, but increased connectivity also led to an increase in communicable diseases that should be mitigated. With respect to marketing, communities closer to improved transport benefited much more than those in distant areas.

Another synthesis study by Raither et al. (ADB, 2019) pointed to the wide range of outcomes and impact and the context specificity of the effects of various roads. Much of the evidence pertained to rural roads. This study also emphasized the impacts of roads on reduced gender disparities, higher land prices, farm productivity, migration, and much more.

An earlier case study-based review by ADB (2002) had found that the poor and very poor benefited substantially from social impacts of rural roads, mainly through access to health, education and miscellaneous economic support services. But socio-economic benefits achieved were clearly different for different socioeconomic groups and the degree of integration of investments in roads with other activities. Where roads were simply parts of larger sector programs they were often benefiting largely better-off farmer groups. The poor required genuinely integrated support programs right through the cycles of production, transportation, and sale; and with transport services linked to improved livelihood and income diversification activities.

Most of the journeys made by the rural poor were for subsistence tasks. The poor relied also on the primary network of paths, tracks, culverts, and basic access routes in the immediate village vicinity and within the villages. Improving such transport was as important to the poor as providing access to markets outside the village.

Chapter VI. Infrastructure and crosscutting issues

Value chains for agricultural development. Two evaluation by AfDB (2019) and ADB (2013) paid close attention to value chains for agricultural development. For AfDB, the availability of appropriate infrastructure and technology was the first of five enabling, context-specific factors to ensure the success of agricultural value chains. Earlier lessons had led the AfDB to substitute wide-ranging agricultural support through more selective and concentrated efforts to leverage the Bank's comparative advantage (AfDB Medium-Term Strategy 2008-2013). Consequently, up to 80 per cent of projects approved had a strong agricultural infrastructure component, including for natural resource management and governance.

The AfDB evaluation found a number of positive practices and results in incorporating infrastructure management in irrigation structure to enhance infrastructure performance, as in Mozambique, Morocco and Kenya. For market infrastructure, insufficient ownership, poor planning and limited functionality often led to low support by local producers and private sector actors. Facilities ended up being underutilized with no clear sustainability mechanism in place, for instance in the case of meat producing facilities in the Democratic Republic of the Congo (DRC) and some milk collection centres in Rwanda (AfDB, 2019).

The earlier ADB evaluation had found that supportive market infrastructure such as storage facilities and transport logistics could increase farmers' selling options but that infrastructure would have to be very specific to the value chain needs and that the placement of markets and storage facilities is critical for value chain development. Rural roads could be helpful for competitive value chains if attention is paid to linking high-value crop production areas to strategic commercial markets (of both outputs and inputs). An enabling environment is seen as very important for value chain expansion, particularly for crowding in private sector through a levelled and incentivized playing field. Another ADB report (ADB 2017 infrastructure special report) points to the priority for regulatory and institutional reforms to make infrastructure more attractive to private investors and generate a pipeline of bankable projects for PPPs.

Crowding in private sector and blended public-private sector solutions also play a major role for the World Bank to optimize the use of scarce public resources (World Bank 2018 Future of Food). Blended finance solutions could also help reduce transaction costs and risks and promote responsible and target group-oriented investments. Ideally, private investments would be broadly sourced and include enterprises at different levels. Increasing private sector investment will require identifying and understanding market failures currently leading to sub-optimal private provision of goods. This concerns particularly the policy and regulatory environment, and also financial services.

At the same time, the IDB 2015 evaluation stressed in its findings and through a key recommendation the necessity to better justify and delineate clear criteria for the financing of private sector or mixed investments as well as subsidies for agriculture. This should be done through either demonstrating that a good or service would be supplied at a socially suboptimal level if left to the market or that it would help to achieve socially desired objectives that would otherwise not be achieved. Whenever feasible, private goods and services should be provided to beneficiaries in return for a fee.

Climate resilience and multiple water-user models. In terms of increasing attention to climate resilience and incorporating broader natural resources concerns in infrastructure a seminal World Bank report (WB, 2019; Hallegatte et al., 2019) arrives at three main messages based on a wide range of case studies, global empirical analyses, and modelling exercises. First, the **lack of resilient infrastructure is indeed harming people and firms.** Non-sustainable infrastructure disruptions due to natural hazards are costly, worldwide upwards from US$391 billion annually, with Africa and South Asia bearing the highest loses from unreliable infrastructures. Secondly, **investing in more resilient infrastructure is robust, profitable and urgent.** Such investments clearly make users better able to manage disruptions. More resilient infrastructure assets pay for themselves and help users and beneficiaries to become more resilient. And third, **good infrastructure management is the necessary basis for resilient infrastructure.** There is no single intervention to make infrastructure systems resilient. Instead, a range of coordinated actions would be required.

For the authors of the report making infrastructure more resilient requires a consistent strategy and coordinated actions that include (i) getting the basics right such as proper planning, operation and maintenance of assets; (ii) building institutions for resilience through defining institutional mandates and strategies for infrastructure resilience; (iii) creating regulations and incentives by including resilience in regulations and incentive systems of infrastructure sectors; (iv) improving decision making through better data, tools and skills; and (v) providing appropriate financing, especially for risk-informed master plans, asset design, and preparedness.[4] Actions on these issues can be highly cost-effective and transformational, but they can nevertheless be challenging to fund in many poor countries, making them priorities for support from the international community.

The **International Water Management Institute (IWMI)** (Coordination Group [CG] system) offers much support for a stronger integrated focus on water. IWMI's strategy – based on its lessons learnt – prioritizes managing water scarcity, water use efficiency and productivity, integrated water resources management, protection of groundwater and ecosystems, as well as joint, participatory and inclusive planning and research, across national boundaries (IWMI, 2019). For IWMI, water management, engineering and economics need to be advanced and well integrated, with expanded partnership models and global dialogue.

Conventionally, water services in developing countries are planned with single objectives in mind: water for crop irrigation, water for livestock, water for domestic use and so on. Larger infrastructure projects, such as major dams, have almost always encompassed a multiple-user model as being essential to their cost-effectiveness. At the local level, however, this approach has been neglected. If water providers invest in local infrastructure which generates more uses and livelihood benefits, then the cost-effectiveness of these investments will also be enhanced.

Different entry points have emerged for multi-user water systems over the past decade. In a **'domestic plus'** approach, the priority is for domestic water uses near to or at homesteads. Increasing the service levels allows households to use water for livestock, horticulture or small-scale enterprises. The income generated enhances the ability to pay and scheme sustainability. In a **'productive plus'** approach, irrigation or livestock watering is the starting point, but other facilities are added. These could be special outlets or canals, troughs, washing places or bridges which improve the access to water for livestock, domestic needs and small-scale manufacturing.

Fragile situations. A 2013 UNDP report on community infrastructure rehabilitation summarizes the agency's learning on institutional and technical aspects of working in fragile situations well. It highlights the contributions of infrastructure to the social contract through reconstructing damaged community assets through inclusive participation. But any investments

[4] For more details see page 15ff of the report.

in social transformation also should be well beware of need for time and appropriate technical expertise of facilitators and local engineers. Projects need to be inclusive in identifying community infrastructure, including disadvantaged groups and women, and that opportunities and benefits should be equitably distributed.

Furthermore, projects should distinguish between the concrete management of a community infrastructure scheme to ensure quality and efficiency (for instance through specialized user associations) and the more general ownership of the initiative by the community to ensure sustainability. Sustainability requires commitment from the community before repairs commence. In the rush of rehabilitation, quality can be too easily sacrificed. Close and regular monitoring of rehabilitation, a skilled engineer and local community representatives must form part of a robust quality control mechanism.

In all of this it often helps to pre-position NGO and community-based organization partners in higher risk countries and develop longer-term work relationships to improve start-up time during emergency and increase country ownership; and to continuously build capacity alongside contingency arrangements. All of this requires taking a long-term perspective and using operations in a humanitarian environment to develop locally-driven and inclusive partnerships and institutions with longer-term, in-built resilience.

Long-standing partnerships during difficult periods were also seen by the **AfDB's comprehensive institutional evaluation** as a cornerstone for the Bank's overall effectiveness particularly in states with fragile situations.[5] The Bank would combine a focus on hard infrastructure with increasing initiatives in fiscal administration, economic and sector analysis, policy dialogue and capacity development. (AfDB 2016 CEDR).

[5] Transition States in AfDB parlance.

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