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Final Evaluation of the Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces

April 2017

PROJECT EVALUATION SERIES

**Final Evaluation of the Programme for
Improvement of Irrigation Systems in Kabul,
Bamyan and Kapisa Provinces**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
OFFICE OF EVALUATION**

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Acronyms and abbreviations

AFS	Agency for Farmers Support
ANPDF	Afghanistan National Peace and Development Framework
CAD	Computer Aided Design
CADP	Comprehensive Agriculture Development Program
CDC	Community Development Council
CPF	Country Programme Framework
EM	Evaluation Manager
ET	Evaluation team
ETL	Evaluation team leader
FAO	Food and Agriculture Organization of the United Nations
FAORAP	FAO Regional Office for Asia and Pacific
GCP	Government Country Programme
GIS	Geographic Information Systems
IWRM	Integrated Water Resource Management
JICA	Japan International Cooperation Agency
M&E	Monitoring and Evaluation
MAIL	Ministry of Agriculture, Irrigation and Livestock
MEW	Ministry of Energy and Water
NCE	No-Cost-Extension
NGO	Non-Government Organisation
NPP	National Priority Programs
OED	FAO Office of Evaluation
RBA	River Basin Agencies
RMO	Rural Movement Organisation
UNEP	United Nations Environment Program of the United Nations
SO	FAO Strategic Objective
ToC	Theory of Change
WMD	Water Management Department

Executive Summary

Introduction

- ES1 This is the Final Evaluation of the Programme for Improvement of Irrigation Systems in Kabul and Bamyan Provinces of Afghanistan (GCP/AFG/071/JPN:USD16.82million), and the Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces of Afghanistan (GCP/AFG/077/JPN: USD22.22 million) and implemented by the Food and Agriculture Organization (FAO), in collaboration with the Ministry of Energy and Water (MEW) of the Government of Afghanistan. Each project was designed to increase food security by: (a) rehabilitating irrigation infrastructure; (b) build the capacity of farmers to operate and maintain the structures; and (c) build capacity of MEW to be able to manage irrigation rehabilitation projects.
- ES2 The main purpose of the evaluation was to provide accountability to the donor and partners by assessing FAO's contribution to the overall objective of the programme i.e. improved, reliable and equitable distribution of irrigation water to increase agricultural production and productivity for improved food security. The final evaluation assessed achievements of the projects at district- and farm-levels derived from project reporting, surveys, interviews and Geographic Information Systems (GIS) maps and photographs. The evaluation determined what activities worked and which activities were less successful so that stakeholders could integrate these experiences into future project designs and implementation of similar projects. Of key importance were the interventions, which enhanced sustainability of each programme's results and the weaknesses, which undermined outcomes.
- ES3 The Final Evaluation was conducted from January to March 2017. The evaluation team was composed of an evaluation manager from FAO's Office of Evaluation (OED); a Team Leader with an evaluation background and experience in Afghanistan; an irrigation engineer; and a national agricultural expert. Field visits, discussions and interviews were conducted with stakeholders and beneficiaries and complemented by data analysis and results detailed in each project's Terminal Report, Beneficiary Impact Surveys and progress reporting.
- ES4 The evaluation was limited by the lack of project monitoring data from early stages of the 071 project. A Monitoring and Evaluation (M&E) unit that was established in early 2015 and completed a Baseline Survey in mid-2015. Therefore, impact surveys and final results were based on one (071) or two production seasons (077). Security remained an obstacle to field work during the evaluation. In addition, as the in-country phase of the evaluation was conducted during January 2017, snow and inclement weather further restricted access.

Main findings

Are the projects still relevant in meeting the needs of the beneficiaries and to what extent do they contribute to implementation of the national development strategy, fulfilment of the FAO Country Programme objectives, and international agreements?

- ES5 With most of Afghanistan's irrigation infrastructure in disrepair, the projects remain relevant for beneficiaries to increase their incomes and improve household food security. The objectives of the government's national development strategies, FAO Country Programme and the Government of Japan's development assistance, recognise the primacy of improved irrigation infrastructure and water management to enhance food security. Building government capacity to manage irrigation rehabilitation activities remains important. Similarly, involving beneficiaries in these activities from the outset, and training them to operate and maintain their irrigation infrastructure continues to be the appropriate approach to irrigation rehabilitation.

What were the intended and unintended results achieved by the concluded projects? To what extent did the projects achieve their intended results?

ES6 Each project achieved substantial results regarding rehabilitated irrigation structures, increased command areas and enhanced productivity and production of the main crops in each province. These results were particularly important for downstream farmers and communities, which previously received little, if any, irrigation water. Support for beneficiaries to diversify farming systems and improve their livelihood resilience received minimal support from each project.

What factors contributed to achieving or not achieving intended outcomes?

ES7 The main factor contributing to achievement of intended outcomes was the competence of project teams to operate in difficult, often unstable and insecure working environments. Continuous support from all levels of MEW to the programme was also an important contributing factor to effective results. Coordination and decision-making arrangements among partners were adequate. Random actions in local communities caused delays that needed to be quickly resolved to minimise delays. The main gap in implementation was the oversight of upland rehabilitation work in river catchments.

Are the projects' results sustainable beyond project conclusion?

ES8 Sustainability considerations were integrated throughout each project's design and implementation, based on building capacity of farmers to efficiently manage water and maintain the newly-built irrigation infrastructure, and MEW to be able to take over responsibility for implementing irrigation rehabilitation work in other areas. The sustainability of the skills base within MEW built by the projects maybe questionable due to the lack of opportunities for trained staff to utilise their new skills. Sustainability of some livelihood results may also be doubtful mainly due to a lack of access for beneficiaries in local areas to the improved inputs demonstrated in training courses.

Conclusions

ES9 **Conclusion 1. (EQ.1)** Through participative processes, the projects supported beneficiaries to increase their production and productivity of major crops, which is a key component of the government's development strategies that recognises the important role irrigated agriculture plays in meeting national food security goals. The results helped reinforce FAO's reputation as a major contributor to improved irrigation systems in Afghanistan, contributed towards FAO's priority to support better water resource utilisation, irrigation development and management through improved infrastructure, and strengthened institutions. Livelihood support delivered effective localised results, but did not enhance widespread uptake of new or improved production systems and diversification of livelihoods among beneficiaries.

ES10 **Conclusion 2. (EQ.2)** Rehabilitation of irrigation and water control structures, and capacity building of government officials and beneficiaries delivered effective results, with downstream communities obtaining the most benefit through more equitable distribution of water allowing them to increase their land under irrigation and increase their productivity. The results also helped reduce disputes between individuals and communities due to water access problems. The new structures also reduced the amount of time and resources that farmers needed to allocate for rebuilding and maintaining their irrigation canals. The projects trained farmers and Mirabs in more efficient water management, operations and maintenance. The programme helped building the capacity of MEW to take over responsibility for all activities in canal rehabilitation projects.

ES11 **Conclusion 3. (EQ.3)** Competent project teams able to work effectively in difficult operational environments and continuous support from all levels of MEW were the main factors contributing to effective outcomes. An overlap between project durations meant the project team was able to remain largely intact and seamlessly continue project

implementation, while also integrating Kapisa province into work plans. Project teams adeptly worked through problems in order to maintain sub-project schedules and budgets. The main implementation gaps were minimal efforts devoted to livelihoods support aimed at encouraging beneficiary households to diversify their livelihood activities; and land rehabilitation works in upland watershed areas in project provinces.

ES12 **Conclusion 4. (EQ.4)** Newly-built water control infrastructure will be sustainable provided farmers practice regular maintenance. The projects targeted Mirabs to play a lead role in prioritising areas of canal rehabilitation, oversight of construction, operations and maintenance, with the specific objective that Mirabs and farmers would take over ownership of the structures. Skills in MEW built through the projects may be less sustainable due to a lack of resources and opportunities for staff to consolidate their skills within their work programmes and/or attendance at refresher courses. Beneficiaries will likely continue those improved or new livelihood practices which provide increased incomes, whereas other new livelihoods promoted by the projects, such as mushroom production or drip irrigation will likely be unsustainable due to a lack of input supplies.

Recommendations

Recommendation 1. (To FAO and donors of projects supporting food security objectives). Irrigation rehabilitation projects need to include well-designed livelihoods support activities that promote efficiency gains and agricultural diversification.

ES13 Diversification and higher productivity would be assisted through supporting farmers to grow higher value crops, such as fruits and vegetables. While the results delivered by contracted NGOs were impressive, funding was insufficient to meet local demand from other farming households. Food security projects should devote 25-30 percent of their budget to livelihood support activities, which need to extend beyond training and demonstrations to support for purchasing inputs and on-going technical support.

Recommendation 2. (To FAO, MEW and donors supporting irrigation rehabilitation projects). Watershed restoration and rehabilitation activities should be an integral part of all irrigation rehabilitation projects.

ES14 An improved natural environment in watersheds helps stabilise unstable ground, reduce siltation and rock damage to irrigation structures in irrigation systems and improves the sustainability of water resources. Terracing, reforestation, check dams and restoration of grasslands assists upland farming communities reliant on access to natural resources and helps with recharging subterranean water reservoirs. Land restoration will become an important element in helping ameliorate the effects of changing weather patterns.

Recommendation 3. (To FAO, donors and designers of irrigation rehabilitation projects). Irrigation rehabilitation interventions need to be designed with longer duration and include effective monitoring and evaluation systems from project commencement.

ES15 Irrigation projects with large budgets and implemented in complex operational environments, such as Afghanistan, need to be three to four years duration. Attention at project commencement needs to ensure all project units are in-place so that projects can be implemented as planned. The lack of a monitoring and evaluation unit meant the donor was not adequately informed about delays; and measured time periods were too short to reflect the impact of the projects on production and productivity of beneficiaries.

Recommendation 4. (To FAO as the implementing partner of irrigation rehabilitation projects). Capacity building activities of government staff should be based on an assessment of needs, available resources (before and after project) and aim to build applicable skills to ensure sustainability of results.

ES16 Without an opportunity to use learned skills in their work, MEW staff will likely quickly lose the skills they acquired through the project. Project teams should critically assess the

capacities and resources of government agencies, both before- and after-project, and align training courses and equipment purchases accordingly, so that learned skills can be readily applicable to work areas of government staff involved in project implementation.

Recommendation 5. (To FAO as the implementing partner and designers of irrigation rehabilitation projects). GIS should be necessary to support evidence-based decision-making, and more accurate monitoring and assessment of project progress and results.

ES17 There are methodological problems in developing cost-effective and reliable approaches that can effectively monitor progress with the resources and expertise available. GIS would assist in overcoming these problems and help establish baselines, monitor project progress, identify limitations, assist with work planning, and increase the irrigation potential of rehabilitated systems.

Recommendation 6. (To FAO as the implementing partner and designers of irrigation rehabilitation projects). Gender inclusiveness in irrigation rehabilitation projects should be addressed through targeting women's participation in project livelihood activities.

ES18 Livelihood activities that target women, such as poultry, dairying, kitchen gardens, fruit and vegetable processing should be integrated into irrigation rehabilitation projects. As women were mainly responsible for household nutrition, then all such livelihood support activities should be accompanied by nutrition training to help reinforce the connection between women diversifying household livelihoods and improving family nutrition.

1. Introduction

1 This is the Final Evaluation of the Programme for Improvement of Irrigation Systems in Kabul and Bamyan Provinces of Afghanistan (GCP/AFG/071/JPN), and the Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces of Afghanistan (GCP/AFG/077/JPN). This evaluation was foreseen at the outset of programme design and included in the respective project documents, according to the arrangements agreed to between the donor, Government of Afghanistan and FAO. GCP/AFG/071/JPN was originally scheduled as a two-year project and received 2.5 year No-Cost extension and GCP/AFG/077/JPN was originally scheduled as a three-year project and received a one-year No-Cost-Extension. The projects were the second and third phases of an ongoing irrigation rehabilitation and capacity building programme funded by the Government of Japan (071: USD16.82 million; 077: USD22.22 million). Both projects were implemented by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Ministry of Energy and Water (MEW). Each project was designed to increase food security by: (a) rehabilitating and upgrading irrigation and water control infrastructure in project provinces; (b) build the capacity of farmer beneficiaries to operate and maintain the built structures; and (c) build capacity of MEW to be able to assume responsibility for managing irrigation rehabilitation projects.

1.1 Purpose of the evaluation

2 The main purpose of the evaluation was to provide accountability to the donor and partners by assessing FAO's contribution to the overall objective of the programme i.e. improved, reliable and equitable distribution of irrigation water to increase agricultural production and productivity for improved food security. The evaluation also proposed lessons from the implementation processes that could inform future decisions by the Governments of Afghanistan and Japan, and FAO regarding formulation of future projects or follow-up interventions.

1.1.1 Intended users

3 The primary audience of the evaluation are the Governments of Japan and Afghanistan, and FAO. These intended users would be interested to know whether the projects were still relevant, how effective the institutional mechanisms were in delivering intended or unintended results, what impact the projects delivered to the beneficiaries (farmers, MEW), and whether the results were sustainable beyond the conclusion of the programme. Lessons learned and recommendations proposed in this evaluation may be used by other project teams as a basis for strategic and programmatic planning and implementation for similar future projects in both Afghanistan and other countries.

1.2 Scope and objective of the evaluation

4 The final evaluation reviewed two irrigation rehabilitation projects implemented by FAO in Afghanistan: GCP/AFG/071/JPN – The Programme for Improvement of Irrigation Systems in Kabul and Bamyan Provinces (February 2012 – July 2016); and GCP/AFG/077/JPN – The Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces (May 2013 – February 2017). The final evaluation assessed achievements of the projects at district- and farm-levels. FAO in Afghanistan has been involved in multiple irrigation and livelihood projects since early 2000s, and subsequently, FAO is considered to have a comparative advantage in irrigation projects as demonstrated in FAO's current involvement in two national level irrigation projects¹. The 2014 Evaluation of the FAO Country Programme highlighted this experience and noted this as a strength of FAO in Afghanistan. Therefore, this final evaluation was able to assess results against other FAO irrigation and livelihood projects in Afghanistan.

1 Irrigation Restoration and Development Project and On-Farm Water Management Project.

- 5 The main objective of this independent evaluation was to learn about results achieved through FAO's ongoing support to irrigation rehabilitation in Afghanistan including results achieved in capacity development, management of water resources and agricultural productivity addressing government partner agencies, Mirabs (local water management groups) and beneficiary farming households.
- 6 Another evaluation objective was to determine successes and failures of the projects to derive lessons learned and best practices for similar, future interventions. The evaluation deduced conclusions, and provided recommendations and lessons learned on performance and good practices based on evidence and the findings of the evaluation, which would be suitable for replication or up-scaling in future projects.
- 7 In order to achieve these objectives, the evaluation addressed following key questions (full list of evaluation questions and sub-questions is included in the TOR annexed to this report):
 - a. **Relevance:** Are the projects still relevant in meeting the needs of the beneficiaries and to what extent do they contribute to implementation of the national development strategy, fulfilment of the FAO Country Programme objectives, and international agreements?
 - b. **Impact:** What were the intended and unintended results achieved by the concluded projects? To what extent did the projects achieve their intended results?
 - c. **Effectiveness:** What factors contributed to achieving or not achieving intended outcomes?
 - d. **Sustainability:** Are the projects' results sustainable beyond project conclusion?

1.3 Methodology

- 8 The Final Evaluation was conducted from January to March 2017.
- 9 The evaluation implemented a transparent and consultative approach with all stakeholders throughout the evaluation. The final evaluation process followed the principles outlined in the UN Evaluation Group's "*Norms for Evaluations in the UN System*", and aligned with OED's Manual on evaluation guidelines and practices.
- 10 A preliminary review was conducted of relevant background documentation that included but was not limited to project documents, progress reports, previous evaluations, photographs (before and after project interventions), GIS maps, baseline, terminal reports, and beneficiary impact assessments conducted by the M&E unit of the projects. The team also researched secondary data for Afghanistan, such as agricultural statistics, national development policies, FAO sectoral evaluations, industry reports and studies.
- 11 Findings on alignment, including alignment with FAO Country Programming Framework (CPF) and FAO Strategic Objectives were mostly based on review of background documentation as well as interviews with FAO staff from the Country Office and the FAO Regional Office for Asia and Pacific (FAORAP).
- 12 To assess the contribution of the projects towards their expected outcomes and impact, primary data was collected through key informant interviews and focus group discussions with representatives from: partner government departments at national and provincial levels, the donor, partner NGOs, FAO Representative Office, FAO Regional Office, and farmers during field visits to the three project provinces. To help validate primary research: the team conducted open and semi-structured interviews with project stakeholders in project areas. This data was further verified, where possible, with walk-through observations during field visits.
- 13 Due to inclement weather and security considerations field visits were restricted to Kabul province (Dakoo canal, karezes) and Kapisa province (Kwaja canal). The provincial project teams arranged in-field visits, where possible, and a general invitation was extended for discussions with beneficiary farmers. The mission met about 40 farmers in Kapisa

(mid-canal), 10 famers (Dakoo canal) and six farmers (Kabul kareze). During these visits, the mission also discussed project implementation, training and other capacity building interventions with project teams and MEW district staff.

- 14 The information collected during these interviews was used to validate and triangulate results detailed in Terminal Reports, progress reports, case studies and Beneficiary Impact Surveys provided by the project team. The national consultant on the evaluation team conducted group discussions and individual interviews with government staff and beneficiaries in the project provinces and in areas inaccessible to the evaluation team. This data helped verify the projects' results detailed in each project's Beneficiary Impact Survey and Terminal Report.
- 15 Stakeholder Surveys conducted by both the project teams and the evaluation team helped answer questions concerning sustainability of project interventions following the end of the programme. These included the baseline survey (July 2015) and impact survey (January 2016) conducted by the M&E unit of the projects, and results of the beneficiary assessment survey conducted by the evaluation team in January 2017.

1.4 Limitations

- 16 The evaluation was limited by the lack of project monitoring data from early stages of the 071 project implementation due to the absence of a Monitoring and Evaluation (M&E) unit within the project.
- 17 Security in Afghanistan remained a serious obstacle to the delivery of assistance and implementation of reconstruction programs, and adds difficulty to field work. During the in-country visit by the evaluation team in January 2017, snow and inclement weather further restricted access to project sites, and Bamyan province was entirely off-limits. Therefore, the evaluation team's field visits were limited to project sites and communities that were accessible from main roads.

2. Background and context of the programme

2.1 Context of the project

- 18 The Programme for Improvement of Irrigation Systems² aimed to enhance food security among farming households in Kabul, Kapisa and Bamyán provinces by improving the availability and reliability of irrigation water to beneficiaries to support increased production and productivity. The projects also supported farmers to diversify their farming systems and improve their livelihood resilience, in addition to increasing their main cropping production. Both projects were implemented by FAO with MEW as the key government counterpart agency, and funded by the Government of Japan. These projects built on the results and lessons learned from an earlier project (GCP/AFG/066/JPN - referred to as Phase I) also implemented by FAO and funded by the Government of Japan.
- 19 Both projects had similar designs, targets and budgets. The components and expected results were:
- (i) rehabilitation and upgrading of irrigation canals, Karezes, water storage facilities and other water conservation and utilisation structures deemed priorities by local communities. These activities were expected to expand the command areas of irrigated land under each rehabilitated system; increase cropping intensity due to more available water during critical months of the cropping calendar; ameliorate the devastating effects of flooding on cropping lands; increase on-farm productivity due to more reliable supplies of irrigation water and improved management of irrigation systems. Almost 40,000 ha was expected to be added to the command areas of the existing irrigation systems to be rehabilitated in each province; and
 - (ii) Capacity building of beneficiary households, MEW staff, project staff, and the private contractors hired by the project in efficient water management, Operations and Maintenance, and extension services. Livelihoods training was expected to encourage farmers to diversify their livelihoods and grow higher value crops and diversify their farming systems.
- 20 Agriculture in Afghanistan is primarily smallholder farming using non-mechanized skills and techniques. Irrigated agriculture accounts for most of the production of cereals and other crops, but is vulnerable to wide fluctuations in available surface water resources that are dependent on annual snowmelt volumes. Irrigation systems were seriously affected during the war, as maintenance was neglected leaving them in varying states of disrepair. The irrigated area of Afghanistan has decreased by almost 70 percent and crop productivity fell more than 50 percent compared to pre-war levels.
- 21 Afghanistan has a tradition of community-based irrigation management called Mirab, composed of elected farmers³. Both projects provided technical training to Mirabs and farmers on operations and maintenance of rehabilitated irrigation systems, and efficient water management. Mirabs participated in all decision-making stages of the rehabilitation cycle: identification, preparation, design, construction, and operation and maintenance of rehabilitated schemes. They, together with representatives from local communities, project supervisory and quality control staff, needed to sign-off at construction completion in order for contractors to receive their final payments. Operations and maintenance of built structures then became the responsibility of local communities.

2 Includes irrigation canals supplied by rivers utilising surface water, Karezes fed by subterranean water supplies, and ponds.

3 Each village has three sources of authority: the malik (village headman), the mirab (master of water distribution), and the mullah (teacher of Islamic laws). Each village has at least one mirab who delegates his authority to sub water masters responsible for the allocation of water to different fields of an irrigation scheme. Mirabs mediate in disputes over water rights and provide the linkage to government authorities for the registration of land and water rights. Repair and maintenance works are executed by mobilising labour for often long periods. All farmers in the command area must contribute in labour, cash or kind.

- 22 In 2014, the FAO Lead Technical Officer advised that only limited application of Integrated Water Resource Management (IWRM)⁴ principles should be included in the 071 project due to the short duration of the project and the desire to produce results. While full analysis of all water systems at basin scale was avoided, the project still considered the multiple water users within irrigation systems during implementation. This advice was supported by the 071 mid-term evaluation. Initial project delays added further urgency and it was decided to concentrate 071 on quicker impact, short duration activities, such as irrigation structures, including ponds and Karezes, selected for rehabilitation based on the number of beneficiaries and incremental increases in command areas. This resulted in project progress measured in structures built and budget disbursement.
- 23 The projects provided district MEW staff “on-the-job” training to help build capacity in the partner agency. Ministry staff were also involved in formal training courses both in Afghanistan and abroad. Developing the ministry’s skills in participatory needs analysis, designing, surveying and supervising civil works was intended to provide the basis for the ministry to continue irrigation development programmes in other river basin systems. MEW were responsible for rehabilitation and construction of dams, head works and main irrigation canals, and oversees the safety and stability of such structures; the Ministry of Agriculture, Irrigation and Livestock (MAIL) were responsible for tertiary channels and on-farm activities, including irrigation and livelihood support. Each project design document considered district officials from each ministry would collaborate to deliver the programmes’ intended results.
- 24 071 commenced in February 2012 with a budget of USD16.82 million and overlapped the no-cost-extension (NCE) period of Phase 1 (066) of the programme (to October 2013). 077 commenced in May 2013 (budget USD22.22 million) and overlapped the 071 NCE (to July 2016). In 077 Kapisa province was added to the existing programme provinces of Kabul and Bamyan, and attracted almost 80 percent of the project’s irrigation construction budget. A NCE was also agreed for 077, with all construction completed in October 2016, and the project finished in February 2017.
- 25 Due to no-cost extensions for the first and second phases of the programme (066 and 071 projects), all project interventions overlapped and therefore, the project teams were mostly kept in-tact for the duration of both 071 and 077 projects.

Actual implementation of the three projects displayed along a timeline:	
GCP/AFG/066/JPN	1-Nov-10 to 31 Oct 2013 No-cost Extension
GCP/AFG/071/JPN	1 Feb 2012 to 31 July 2016 No cost extension
GCP/AFG/077/JPN	1 May 2013 to 28 Feb 2017 No cost extension
Years	2010 2011 2012 2013 2014 2015 2016 2017
	N D J F M A M J J A S C N D J F M A M J J A S C N D J F M A M J J A S C N D J F M A M J J A S C N D J F

Figure 1. Implementation schedules for all phases of the programme

- 26 The Project Management Unit in Kabul also included project implementation staff for Kabul and Kapisa provinces. A project implementation unit was established in Bamyan during Phase I and continued to be staffed until the conclusion of 077. The projects contracted external agencies to help deliver activities:
 - the UN Environment Programme (UNEP, 071) was contracted to rehabilitate upland watershed areas in Bamyan; and
 - two local NGOs (Agency for Farmers Support: AFS and Rural Movement Organisation: RMO) to provide livelihood support interventions for beneficiary households in project areas.
- 27 To further support livelihood diversification and resilience among local communities, the projects’ designs envisaged overlap with existing FAO projects in the same provinces to deliver support in areas such as dairying, certified seed distribution, nurseries, poultry etc., with an emphasis on targeting income-generating activities for marginalised groups, such as women and landless households in command areas who were not direct beneficiaries of rehabilitated and constructed infrastructure.

4 IWRM targets an entire river valley or sub-basin for interventions aimed at maximising water use efficiency for all basin water consumers

2.2 The theory of change

28 The Theory of Change (TOC) describes and illustrates how and why a desired change was expected to happen in a particular context. Both projects had similar designs. Project activities included initial needs analyses and participatory project intervention approaches together with appropriate training on better water management, livelihood support, and training of MEW staff on management of the full cycle of irrigation restoration activities. These interventions led to desired results regarding areas of land included within command areas of rehabilitated canals, enhanced capacities within farming communities and MEW, and improved livelihoods for beneficiary households. With a favourable enabling environment and utilisation of these enhanced skills, these outcomes led to the higher level result, which was enhanced food security through increased agriculture production and productivity with the main indicators being increased wheat yields and incomes.

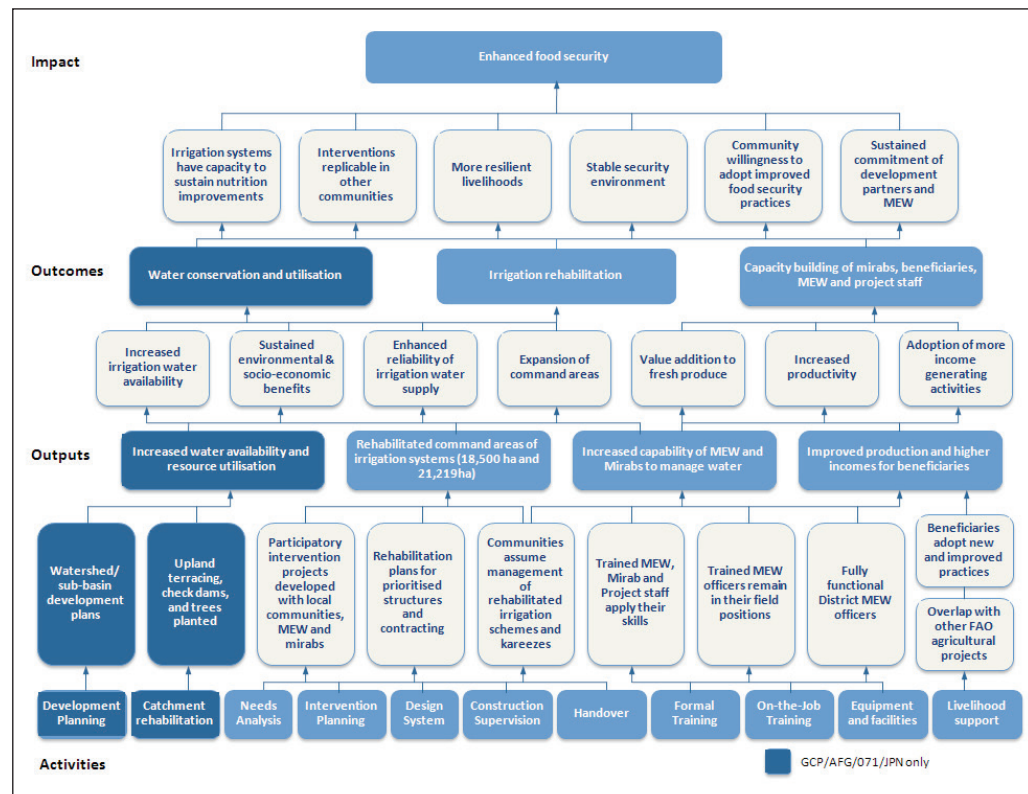


Figure 2. The programme's Theory of Change

3. Evaluation questions: key findings

- 29 The evaluation findings are presented in response to the main evaluation questions and sub-questions. Evidence obtained from relevant sources, triangulated, and supported by analysis and assessments substantiate the main findings. Questions and sub-sections reflect the context of each project as presented in the theory of change. Crosscutting issues such as gender and other equity issues, human rights, environment, climate change and partnerships are addressed under each of the evaluation questions.

3.1 Evaluation question 1. Are the projects still relevant in meeting the needs of the beneficiaries and to what extent do they contribute to implementation of the national development strategy, fulfilment of the FAO Country Programme objectives, and international agreements?

With most of Afghanistan's irrigation infrastructure in a state of disrepair, the projects remain highly relevant for beneficiaries to increase their incomes and improve household food security. The objectives of the government's national development strategies, FAO Country Programme and the Government of Japan's development assistance, recognise the primacy of improved irrigation infrastructure and water management to enhance food security in Afghanistan. Building government capacity to implement the full cycle of activities involved in irrigation rehabilitation works remains important. Similarly, involving beneficiaries in these activities from the outset, and training them to operate and maintain their newly-built water management infrastructure continues to be an appropriate approach to irrigation rehabilitation.

- 30 The projects remain highly relevant to meeting the needs of beneficiaries. Over 70 percent of Afghanistan's irrigation infrastructure is in disrepair and in need of rehabilitation and modernising in order to improve water delivery and more efficient use of the resource. As demonstrated in both projects, quality irrigation infrastructure improves water availability, equity and reliability at key periods during the cropping season, particularly for farmers further downstream who traditionally received little, if any, irrigation water. This led to increased production of key crops in all project provinces that enhanced food security for both local communities and Afghanistan.
- 31 Afghanistan irrigation networks are dependent on surface water, which in-turn, rely on annual snowmelt in river catchments. Improved irrigation infrastructure helped increase efficiency of irrigation water distribution so that more farmers can properly plan their cropping cycles and maximise their use of other improved inputs. These outcomes will become more critical as the effects of changing weather patterns potentially reduce annual snowfall in Afghanistan and thus, volumes of surface water available for irrigation. Therefore, rehabilitated and improved irrigation structures will be important to improving on-farm productivity with diminishing water supplies.
- 32 The projects remain relevant in combating the devastating impact of flooding in different areas of the projects. Before the project interventions, farmers with irrigation needed to continually re-build their canals and water control structures with local materials that were inadequate against the force of annual floods. Farmers could not properly plan their cropping patterns and they adapted by gradually reducing the areas available for irrigated agriculture. The projects built more substantial water control structures that diminished the threat of flooding, which was the key benefit of the project (077) mentioned by farmers to the mission team in Kapisa province.
- 33 Another key problem that the project area faced was sustainability of the water resources base, due to degradation in catchment areas. The river valleys and corresponding watersheds suffer over-grazing, deforestation and general environmental decline. Deforestation and dry-land farming on steep slopes creates erosion problems. 071 attempted to tackle these problems and improve the canal watersheds in Bamyan through a joint program with United Nations Environment Program (UNEP) for reforestation, terracing, and check dams.

- 34 **National Development Strategies.** The projects remained relevant to the Government of Afghanistan's national development strategy (the Afghanistan National Peace and Development Framework (ANPDF: 2017 – 2021)). Contained within the framework is the Comprehensive Agriculture Development Program (CADP) that aims to raise productivity and household incomes in rural areas; improve agricultural import substitution and agro-industry; and increase exports. Within CADP, the FAO irrigation projects were relevant to the following National Priority Programs (NPP):
- NPP 1: Improving Irrigation Systems - aims to increase irrigated land from 2.45 million ha to 2.74million ha during the five-year period of the program, while also targeting increased production and productivity through irrigation and improved water management practices. Institutional strengthening involves reform of legislation, policies, institutions and improved management to promote investment in irrigation development by the private sector. NPP1 also emphasises institutional strengthening of government irrigation agencies at all levels, and establishment of Irrigation Associations at the community level.
 - NPP 2: Wheat and cereal production - aims to increase wheat production under irrigation from the current 2.45 MT per ha to 3.1 MT per ha within five years.
 - NPP3: Horticulture Value Chain development - aims to increase land under high value horticulture crops by 12,500 ha per year; increase productivity by 5-10 percent per year; increase investment in improved post-harvest infrastructure and markets; support private investment; and embrace international certification standards.
- 35 **FAO Country Programme.** The projects contributed towards fulfilment of FAO's Country Programme (2012-2016)⁵ objectives (Country Programme Framework – CPF) Priority Area No 2: Support to better water resource and irrigation development and management with a focus on: Outcome 2.2: Enhanced capacity to develop and manage water resources through improved physical infrastructure and institutional strengthening to support agriculture production; and Outcome 2.3: Enhanced national capacity to respond to water hazards and climate change.
- 36 The evaluation of FAO's Cooperation Programme in Afghanistan (2007 – 2012)⁶ cited these projects as part of FAO's involvement in Afghanistan's irrigation sector that were deemed relevant to the needs and priorities of the rural population. FAO irrigation projects
- ".....have a well-developed system of responding to local demand, whereby water users bring their requests to the Community Development Councils (CDCs) and subsequently to a Sub-Basin Authority (i.e. a MEW sub-office). If the request is found relevant and feasible, technical surveys and feasibility studies will be conducted, thus reflecting the priorities of the water users and their communities".*
- The evaluation noted that such good practices with communities appeared likely to be sustainable.
- 37 **International Agreements.** Four of Afghanistan's five river basins are shared with neighbouring countries and additional water use by Afghanistan will affect downstream riparian countries. The Government of Afghanistan prepared a Draft Policy on Transboundary Waters based on the 2009 Water Law, which conferred management and planning for transboundary waters between Afghanistan and neighbouring countries and changes of water-courses to the responsibility of MEW with agreement from other relevant ministries. As the Policy was still in draft form, transboundary water issues were currently being addressed through *ad hoc* procedures. The projects did not alter existing river-courses or build new canals that would directly affect water flow volumes down any of the rivers in the project areas.
- 38 It was difficult to predict whether the improved irrigation infrastructure caused more water to be drawn from rivers due to absence of measured river flow data at that location. While improved infrastructure led to more efficient use of irrigation water, it also provided more equitable distribution of water among farmers, particularly downstream farming

5 The FAO Country Programme (2016-2019) was still in-draft format at time of the evaluation.

6 FAO (2014). Evaluation of FAO's Cooperation in Afghanistan, 2007 – 2012. Office of Evaluation. Rome.

households. These farmers were able to bring more fallow lands under irrigation, and thus, the savings in efficiency may have been counter-balanced by the increased areas now irrigated.

- Have project interventions responded to the needs and priorities identified by the government?

39 The projects were relevant to the needs and priorities of the government as described in APNDF. This framework directed government ministries and agencies to refocus their efforts on the NPP strategies, which included a gradual shift from an overall sectoral approach to one, which focused resources in areas that promised greatest returns on investment. The FAO-implemented projects were relevant to three of these priority areas in agriculture and rural development. The sections of irrigation canals requiring rehabilitation were prioritised by farmers and verified by MEW officers, taking into account the needs of local communities and potential impact of intervention.

40 NPPs recognised these bottom-up approaches followed by both projects whereby farmers' priorities guided project interventions, including support by government institutions and inclusion in their planning and support activities. As recognised in the NPPs, the Ministry of Agriculture, Irrigation and Livestock (MAIL), the Ministry of Rural Reconstruction and Development (MRRD) and MEW needed continued investment support to achieve the ambitious goals specified in the NPPs.

- Have these responded to the intended objectives established by the donor?

41 These projects fall under the third category of the Government of Japan's assistance to Afghanistan program: Assistance for Afghanistan's sustainable and self-reliant development. Within this category, the Government of Japan focused its development assistance on the agricultural sector, infrastructure development, human resource development, education and health/medical care. These projects contributed to the donor's intended objectives of supporting sustainable development in agriculture, infrastructure and human resource development. The capacity building activities provided to government officials by the projects contributed to the Government of Japan's objective for self-reliant development in Afghanistan. This result was also reflected in the 2016 Annual Report of the Japan International Cooperation Agency (JICA)⁷ which mentioned the specific assistance provided by the Government of Japan through development assistance projects in Afghanistan to the:

".....enhancement of expertise for maintenance and management of irrigation facilities aiming to improve agricultural productivity."

- How have the interventions contributed to strengthening national and local capacity development to design and implement relevant activities, steps and processes?

42 Both projects were relevant in contributing to strengthening national and local capacities to design and implement development interventions. MEW lacks technical capacities and regulatory enforcement in the provinces, and limited capacity and outreach at the district level. The projects helped address these challenges through extensive on-the-job training and formal training both in Afghanistan and abroad of MEW staff at provincial and national levels. The projects helped MEW refocus its efforts and reform agenda towards a more decentralised approach to its investment priorities and project implementation.

43 The design of each project actively included provincial MEW staff (Water Management Department: WMD) as integral members of each project team: they were involved at every stage of the project cycle – from community mobilisation and prioritisation of sub-projects, design of interventions, to oversight of construction, training in operations and maintenance, and final sign-off of sub-project completion and handover to communities. MEW and project staff received formal training in-country and abroad in project management, surveying methods, and designing irrigation structures. Beneficiary farmers and Mirabs received on-the-job training in better water management practices, and

7 https://www.jica.go.jp/english/publications/reports/annual/2016/c8h0vm0000aj21oz-att/2016_14.pdf

operations and maintenance of their built irrigation structures so they could independently manage more efficient water distribution and contribute to sustainability of the improved irrigation systems.

3.2 Evaluation question 2. What were the intended and unintended results achieved by the concluded projects? To what extent did the projects achieve their intended results?

Each project achieved substantial results regarding rehabilitated irrigation structures, increased command areas and enhanced productivity and production of the main crops in each province. These results were particularly important for downstream farmers and communities, which previously received little, if any, irrigation water. The intention to support beneficiaries to diversify their farming systems and improve their livelihood resilience received minimal support from each project.

- 44 071 built and rehabilitated 225 structures (81 canals, 135 Karezes and nine ponds) that supported 52,706 households in 313 villages. The impact per household varied, dependent on the volumes of water each household received prior to rehabilitation of canals, and how much available land they had abandoned that they could begin to irrigate once again. The project team reported that the areas under irrigation increased from 15,378 ha to 19,717 ha with guaranteed supplies of water when required. That meant that 4,339 ha of abandoned land was now irrigated, which was 1,217 ha above the target. Wheat yields in project areas increased by 53 percent and potato yields in Bamyan by 74 percent following rehabilitation of canals⁸.
- 45 Under 077, the project team built and rehabilitated 635 structures in 18 irrigation schemes (Kabul: 85 structures in five irrigation schemes; Bamyan: 29 structures in 10 irrigation schemes; and Kapisa: 521 structures in three irrigation schemes). The project team assessed that total command areas for the 18 schemes increased from 11,353 ha to 14,451 ha,⁹ which increased the irrigated land in these schemes by 27.3 percent, and benefitted 53,160 households. Following project completion, the project M&E unit assessed beneficiaries who stated their wheat yields increased by 29 percent, grapes by 33 percent and potatoes by 73 percent¹⁰.
- 46 The Evaluation Team involved GIS Analysts from the Forestry Division of FAO (Rome) to use the Collect Earth program to plot vegetative cover along the length of Kwaja Canal (Kapisa). This GIS analysis of the area results for Kwaja canal rehabilitation project (Annex 2) indicated that the land added in the incremental areas by the project may have been over-estimated by the project teams as there appeared to be no evidence of any additional cropping activity in the incremental area of Kwaja Canal. GIS analysis did support the project results within the existing command area of this canal. More water should be reaching these downstream areas due to improved water management practices and structures further upstream (in the existing command area). It would be expected that farmers would begin double cropping in these incremental areas once they were guaranteed a reliable supply of water in the areas furthest downstream from the headworks. However, as construction was only completed in late 2016, a more accurate estimation of the total area of land added by these projects in all canals can only be deduced during the next few years when farmers will be able to utilise the fully rehabilitated canals over an entire cropping season. Farmers were currently utilising these incremental areas for dryland crops and pasture.
- 47 The 077 Beneficiary Impact Survey indicated that about 30 percent of rehabilitated canals registered no increases in irrigated area. Although expanding command areas was important, the projects aimed for multiple results when planning rehabilitation of traditional schemes. Results were mostly determined by the topography of a particular canal. The projects did

8 FAO (2016) Results of an Impact Survey of the Programme for Improvement of Irrigation Systems in Bamyan and Kabul Provinces, GCP/AFG/071/JPN

9 The targets for incremental irrigated land increases stated in the 077 project design document, from 21,219 ha to 24,678 ha with Kapisa contributing 23,250 ha, were gathered through farmer interviews during field surveys by Water Management Department in MEW in the project command areas prior to commencement of the project. Following GIS measurements of the command areas by the project team, henceforth, the more accurate GIS data was quoted in all progress results for 077.

10 FAO (2017). Impact Assessment Report: The Programme for Improvement of Irrigation Systems, GCP/AFG/077/JPN

not undertake major structural canal changes, but provided relatively modest interventions to existing canals to improve equitable water distribution. However, these interventions provided additional benefits to farmers - minimised water wastage and seepage, increased water access by improved conveyance, prevented flood damage to communities and cultivated areas, and reduced the canal maintenance burden for farmers.

- 48 The addition of Kapisa province in 077 proved challenging for the team and reconciling disputes in the field despite continuous community consultations, contractor agreements and agreed schedules. These problems were due to the size and complexity of the three primary canals and associated branch canals in Kapisa included in the project. These canals cross many districts, villages and households and maintaining agreement on diversions and canal closures during construction proved difficult for the project team and MEW staff. Kapisa canal rehabilitation sub-projects dominated 077 consuming over 75 percent of the total budget allocated for canal rehabilitation and infrastructure construction (Component 1) due to the large number of rehabilitation works included along each canal.
- 49 Phase II (071) was designed to follow IWRM principles as specified in MEW policy, whereby river basin planning adopted a holistic approach to achieve service-oriented water control. This planning needed to account for water allocations among all users in a river basin, linkages between surface and groundwater resources, and linkages between return flows and re-circulation of water within and among irrigation systems. 071 was heralded as a unique opportunity to design and implement an irrigation project in a systematic valley-based approach together with strengthened local institutions, which would provide a methodology for future irrigation development projects based on the IWRM framework.
- 50 The intended full-scale application of IWRM in 071 did not eventuate. Such a comprehensive approach was not realistic for project duration of only three years (two years plus one year extension). Plus, slippages in team member recruitment, diverted resources to other local surveys by MEW, a limited construction season in Bamyan, slow disbursement of funds, and the desire to achieve some results meant the IWRM framework was applied only in limited scale soon after 071 commenced, and irrigation structures were chosen for rehabilitation based on area and number of beneficiaries within each sub-project. Progress was then measured in structures built and funds disbursed. It was not clear why 071 project designers continued to pursue IWRM principles with such a short duration project considering experiences from the first phase of the program indicated the IWRM approach was not feasible.
- 51 MEW staff effectively mobilised communities in project areas and discussed proposed segments of irrigation canals and water control structures for construction and rehabilitation, which community members considered most important to their livelihoods. The intended result of community involvement from the outset of each intervention was community ownership of built structures. Following canal rehabilitation, farmers spent less time in maintaining irrigation infrastructure and rebuilding damaged areas, which a major benefit was for them as indicated in feedback from beneficiary surveys and discussions with farmers during the mission field visits. The supply of irrigation water was now more reliable and equitably distributed among communities following interventions in accordance with their needs, which helped reduce disputes by an estimated 75 percent between water users over access to water at critical periods during the cropping season¹¹.
- What are the tangible changes in the livelihoods of the communities in targeted provinces?
- 52 The evaluation of FAO's Country Program in 2014¹² found that the increased irrigated areas and yields brought about by FAO's irrigation projects in Afghanistan, which included both 071 and 077, had led to improved living conditions of water users and to a significant impact in terms of income and food security. Livelihood improvements were due to increased crop yields from existing crop systems (wheat, grapes, potatoes). Farmers met in Kapisa during the mission field visits said they were now growing maize as their second annual crop that required less water during the autumn growing period, which coincided with less irrigation water supply.

11 ibid

12 Op.cit

- 53 While each project aimed to increase wheat and potato production as the main mechanism to improve livelihoods, the design of each project also included livelihood training activities that aimed to encourage beneficiaries to pursue higher value commodity production beyond traditional cereals and assist with diversifying their livelihoods. The design activities included:
- NGOs contracted to train and demonstrate to beneficiaries diversified livelihood production;
 - Overlap with other FAO-implemented projects in the project areas that covered sectors such as certified seed distribution, forestry, nutrition and food security, plant protection, dairying and livestock production, would support farmers to diversify livelihoods; and
 - Collaboration with MAIL at district level to train and implement on-farm livelihood support activities such as drip irrigation for fruit and vegetable production.
- 54 The 071 design stated that project interventions would bring additional economic opportunities and help farmers towards a gradual shift from subsistence to semi-commercial farming through the technical assistance component of the project. Each project's links with other FAO projects and programmes were designed to maximise productivity on irrigated lands and further enhance sustainability.
- 55 Apart from contracts provided to two local NGOs, the other livelihood support activities did not happen. The contracted NGOs targeted women and mainly landless households in command areas who would not fully benefit from the rehabilitation of the irrigation canals. Their activities included training and support for small-scale production of fruit and vegetables, poultry, mushrooms, green-house and tunnel production of off-season vegetables, milk production, and demonstrations of orchard drip irrigation systems.
- 56 While these NGO interventions delivered excellent results among beneficiaries, their operational budgets were small, and they could not satisfy high local demand for similar interventions from other households i.e. there was significant demand for alternative livelihood support interventions in project areas. For projects with food security as a major objective, the lack of livelihood support to assist beneficiaries to diversify their farming systems and develop more resilient livelihoods was the main weakness among both project's results.
- 57 Despite repeated efforts by many projects, including 071 and 077 teams, collaboration between MAIL and MEW remained inadequate. Interactions between ministries in these projects was minimal, apart from some MAIL inputs at the district level during activity planning stages. Overlap with other FAO projects was not explored as a means to improve livelihoods by project teams and no collaborations occurred between FAO projects in common project areas. Therefore, the most effective means to deliver project support for improved livelihood resilience and diversity was through local NGO contracts. However, the contracts provided by each project appeared tokenistic in order to cover the livelihood and gender requirements in each project. Beneficiary farmers in both Kapisa and Kabul have ready access to Kabul markets and opportunities exist for farmers to supply fresh produce to these high-demand markets. While the projects provided some livelihood support training and demonstrations to beneficiary communities, there was no active attempt to promote diversification of production and linkages with market opportunities as a means to increase beneficiary household incomes.
- How has the projects' implementation supported institutional and individual capacity development at the local and national levels?
- 58 The World Bank¹³ and FAO irrigation projects were the only means of increasing the capacity and exposing MEW staff to best practices, at national, provincial and district levels. In-field and classroom training courses, seminars and field visits were provided to MEW staff, project team members, Mirabs and farmers. Demonstrations of orchard drip-irrigation, tunnel and green-house vegetable production, poultry production and clean milk processing for farming households in project areas were also sponsored by the projects via local NGOs.

13 The Irrigation Restoration and Development Project (2011-2020)

Table 1. 071 Training Programme

071 Training	Participants			Place
	MEW staff	FAO Staff	Mirab/farmers	
On-the-Job Training				
Design, Survey, Social and Environmental, and Quality Control of irrigation structures	28			Kabul/Bamyan
In-Country Training				
Low cost Sanitation		1		Kabul
Effective Facilitation Skills		2		Kabul
Quality Control and Design of Irrigation schemes	28			Kabul/Bamyan
Community Watershed Management and planning		2		Bamyan
Orientation workshop of Baseline survey	20	1		Kabul
Refresher of MHP Operation and Maintenance		1	18	Bamyan
Sustainable use of Micro Hydro power units	10	2		Bamyan
Water Resources Management	11			Kabul
Impact assessment	9			Kabul
Training Abroad				
Certificate program in project management	10			Istanbul
Livelihoods training				
Poultry and Vegetable production			150	Bamyan
Horticulture, vegetable production, green house, plastic tunnel and Mushroom production			202	Kabul
Operations and Maintenance Training				
Operation and Maintenance training			1071	Bamyan
Operation and Maintenance training			84	Kabul
Totals	116	8	1525	

59 The project teams commented that:

“MEW made commendable efforts in identifying training areas and selecting relevant staff to participate in capacity building programmes both in-country and aboard.”¹⁴

The projects organised and provided a comprehensive program of practical and class-room training courses well-adapted to adult learning principles. To reinforce learning among trainees, MEW was expected to maintain the capacity built among its staff members by arranging regular in-house refresher courses.

60 Capacity building remains particularly challenging with government departments. Often after technical training many national staff leave poorly rewarded government employment to join the staff of various international agencies, including the UN, INGOs and local contractors. Another issue that was raised during the mission was the lack of necessary equipment and machinery in government offices that staff could utilise with their newly acquired skills. For example, many MEW staff received training abroad in technical areas of irrigation design including geomatics, surveying, hydrologic modelling, GIS mapping, contract and procurement management. Unfortunately, these MEW trainees usually have only limited opportunities to utilise their newly acquired skills because their offices do not possess the necessary equipment to undertake any irrigation design task. Unless donor-funded projects provide the necessary equipment, then government staff, such as the MEW trainees on these projects, cannot improve their skills through fieldwork and they eventually lose their knowledge and skills acquired through training.

¹⁴ FAO (2017) The Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces (GCP/AFG/077/JPN) Terminal Report, Kabul

- 61 MEW was establishing five River Basin Agencies (RBA) for the major watersheds in Afghanistan, and water resource development plans and programmes will be implemented through these agencies. Under RBAs were River Basin Councils with the responsibility of integrating planning and participation of water users and other social institutions in management and development of water resources, protection of the environment, equitable distribution of water and other relevant matters.
- 62 This framework was still being developed and so, the FAO projects focused attention on working and training with Mirabs, which are community-based institutions that lead in organising water distribution systems and maintenance tasks of canals and diversion weirs. The Mirab system was weakened by various social issues during the conflict years in Afghanistan and their importance diminished in managing community water distribution. The projects helped build the capacities of Mirabs and farmers in project areas to better manage water distribution from canals, and proper operations and maintenance of rehabilitated water control structures.

Table 2. 077 Training programme

077 Training Course	Participants			Place
	MEW Staff	FAO Staff	Mirabs farmers	
On-The-Job Training				
Design, Social and Environment Survey, Quality Control and measurement, GIS, procurement, planning, Contract and procurement, Supervision, management, IT and administrative management.	39			Kabul, Bamyan Kapisa
Quality Control, Social, Design, Auto CAD, Monitoring and Evaluation, Survey, Project management, Supervision and IT	16			Kabul, Kapisa, Bamyan
Contract and Monitoring and Evaluation	2			Kabul
In-Country Training				
Quality Control and Design of Irrigation scheme	10			Kapisa
Sharing Idea of Small scale water Resources rehabilitation and management training	35	12		Kabul, Kapisa, Bamyan
Operation, maintenance Micro hydro power units	4		36	Kabul/Bamyan
Survey and Design of irrigation structures	19			Kabul
Geomatics and Surveying training	25	3		Kapisa/Bamyan
Sustainable use of Micro hydro power unit	14			Kabul
Procurement and Contract Management	29	3		All provinces
Results-based Monitoring and Evaluation	12			Kabul
Field Investigation and Diversion Structures	12	2		Kabul
Social Mobilization/ Conflict Resolution	23	2		Kapisa/Kabul
Micro Hydro Power for Rural Electrification	16			Kabul
Hydrogeological and Geophysical Surveying	17			Kabul
Introduction to Monitoring & Evaluation	18			Kabul
Training Abroad				
Results-based Monitoring and Evaluation	5	2		Thailand
Hydrologic Modelling and GIS	9	4		India
Small scale water rehabilitation & management	10	3		Thailand
Geomatics and Surveying	10	3		Thailand
Contract and Procurement Management	9	2		Thailand
Social Mobilization and Conflict Resolution	9	3		Philippines
ICT Management	9	3		India
Water resources Management	10	2		India
Planning/design/implement irrigation schemes	12	3		India
Topographical Survey	11	1		India
Financial Management for Projects	10	2		India

Livelihoods Training				
Poultry, Mushroom, Vegetable, Orchard Management and Drip irrigation systems			193	Kabul, Kapisa Bamyan
Milk Production, Processing and Marketing			25	Bamyan
Operations and Maintenance Training				
Operation and maintenance training			47	Kabul
Operation and maintenance training			53	Kapisa
Operation and maintenance training			22	Bamyan
Totals	395	50	376	

- What positive or negative impacts have project activities had on individuals within households and communities?

63 For individual and farming household beneficiaries, the resultant increased productivity of their expanded areas under irrigation meant improved food security, larger marketable surpluses of produce and increased household incomes. With more available and reliable water supplies farmers invested in higher quality production inputs (where available), which also contributed to their improved productivity. The 071 beneficiary impact survey estimated that farmer incomes increased by 53 percent (wheat), 55 percent (grapes), and 73 percent (potatoes) after rehabilitation of canal structures. Construction contractors were advised to employ local labourers as much as possible and many individuals benefitted from this off-farm income during construction of irrigation infrastructure in their local areas.

Table 3. Yield increases for farmers located at different sections along rehabilitated canals (077 Impact Survey, January 2017)

Crop	Average crop yield (kg/ha)								
	Upstream			Midstream			Downstream		
	Before	After	Increase (%)	Before	After	Increase (%)	Before	After	Increase (%)
Wheat	2,100	2,652	26.0	2,294	2,801	22.1	1,810	2,379	31.5
Grapes	13,957	19,024	36.3	11,909	14,908	25.1	12,711	15,937	25.4
Potatoes	10,329	13,395	29.7	7,768	10,785	38.8	9,547	13,402	40.4
Corn	1,789	2,258	26.2	1,579	2,098	32.9	1,472	1,989	35.4

64 Farmers downstream of head works in each canal system were the major beneficiaries relative to farmers located further upstream. A more equitable distribution of water was a major benefit for these farmers, who traditionally, often received little, if any, water during critical periods of the crop growing season. With more competent management of the canal systems and more reliable supplies of water following project interventions, downstream farmers benefitted with higher productivity increases than farmers upstream. They were also able to bring more fallow lands under irrigation than upstream farmers that added to their increased productivity and production.

Table 4. Fallow lands brought under irrigation by farmers along canals (077 Impact Survey, January 2017)

	Irrigated Area Before Project (ha)				Irrigated Area After Project (ha)				Av. % Increase		
	Head	Mid	Down	Total	Head	Mid	Down	Total	Head	Mid	Down
Bamyan	157	185	101	444	175	208	138	522	11.9	12.3	36.0
Kabul	778	867	838	2,483	934	1,075	1,149	3,220	20.0	24.0	37.0
Kapisa	1,451	3,856	2,867	8,173	1,668	4,434	4,332	10,434	15.0	15.0	51.1
Total	2,385	4,907	3,806	11,100	2,777	5,717	5,618	1,4176	16.4	16.5	47.6

- 65 With better supplies of irrigation water, many farmers now wished to invest in higher quality production inputs in order to reap higher returns. However, guaranteed higher quality seeds and fertilisers were not readily available in local markets, and farmers in Kabul indicated to the mission, this now was the main impediment to further increasing their productivity and production of all crops. With improved irrigation and water control infrastructure, farmers acknowledged they now spent much less time and effort in maintenance and repairs of their canals, and estimated their time devoted to maintenance had halved. They no longer needed to cut down trees for timber to strengthen canal inlets, banks and locally-made diversion structures following construction of sturdy, well-designed irrigation infrastructure. For most individuals, with more equitable distribution of water and sufficient supplies to grow their crops, they were no longer in conflict with their neighbours or other communities over water¹⁵.
- 66 While the major focus of these projects was irrigation canal rehabilitation and construction of water control infrastructure, the projects also addressed community needs for drinking water and other domestic water uses. In fact, Karezes and ponds were more important for domestic drinking water supplies and other household uses, than for irrigation purposes. Social infrastructure such as washing platforms for women and footbridges for cattle to cross canals, were also included in rehabilitation works. The project was therefore able to fulfil multiple water needs for communities.
- Have gender considerations been integrated in the design and implementation of the projects?
- 67 The design and implementation of each project did not adequately consider the roles of women both as members of the implementation teams or as beneficiaries. Both projects were principally concerned with structural irrigation and hydrological engineering matters as they relate to communities, (mainly those households with access to irrigated crop land regardless of gender). Accommodating gender in irrigation projects in Afghanistan was also difficult due to the contextual issues. As highlighted in a recent study by UN Women –
- “...business owners, community council members and religious leaders agree that women’s economic and legal rights are not practised in Afghanistan for a variety of reasons. Although these stakeholders mention the importance of female participation in the labour force and the value of marital rights under the law, they highlighted insecurity, political corruption and patriarchal norms as key barriers preventing the realization of women’s rights in practice.”¹⁶*
- 68 The labour force in Afghanistan has few female engineers and women were restricted in their movements outside local areas without a male family member - the projects required extensive fieldwork and interactions with Mirabs, government counterparts and farmers during planning and design, which were activities not conducive to gender inclusiveness.
- 69 The main areas of focus for women as project beneficiaries were in the livelihood support activities, with most interventions targeting women with alternative livelihood and income-generating activities. The NGOs hired to conduct these training courses utilised female trainers during implementation of dairy support activities, poultry training courses and field demonstrations in Kabul and Kapisa.
- 70 Gender concerns were observed in the rehabilitation of some irrigation structures, such as construction of pathways to irrigation canals that could be hazardous particularly for pregnant women, the elderly and young children. The project also included construction of appropriate structures, e.g. washing platforms accommodating women’s needs. A benefit for some households following rehabilitation of canals and construction of water control structures was the establishment of more convenient household water supply points that removed the necessity for women and children to walk longer distances to springs or other water locations to fetch water for household consumption. Project monitoring data, however, was not disaggregated by gender.

15 Farmer discussions with mission in Kabul and Kapisa during field visits.

16 Survey on women’s economic rights in Afghanistan. UN Women, 2016. http://www2.unwomen.org/-/media/field%20office%20eseasia/docs/publications/2016/12/04-co_kap_report_7dec_email.pdf?vs=3301

3.3 Evaluation question 3. What factors contributed to achieving or not achieving intended outcomes?

The main factor contributing to achievement of intended outcomes was the competence of project teams to operate in difficult, often unstable and insecure working environments. Continuous support from all levels of MEW to the programme was also an important contributing factor to effective results. Coordination and decision-making arrangements among partners were adequate. Unexpected actions in local communities caused delays that needed to be quickly resolved to minimise delays. The main gap in implementation was the oversight of upland rehabilitation work in river catchments.

- 71 The main factor that contributed to the achievement of the intended results was the competence of the teams in implementing project activities, and overall project management in difficult and often unstable operational environments. Each project province had unique issues and problems that led to setbacks, which the project teams needed to resolve in a timely fashion in order to avoid extended hold-ups to implementation schedules.
- 72 Due to delays and extensions to project durations, the three phases of the irrigation rehabilitation programme overlapped, which was fortuitous as this allowed the team to seamlessly continue implementation of the programme as each project ended. The Mid-Term Review of 071 and the project design document for 077 noted the drawn-out recruitment process and difficulties for irrigation projects in Afghanistan for recruiting suitably qualified national and international staff, particularly staff willing to work in Bamyan. Without a break between 071 and 077, the programme was able to retain the same team members to implement activities in all project areas.
- To what extent has the institutional and implementation set-up been conducive to achieve the intended results?
- 73 Another important factor that contributed towards achieving intended outcomes was the continued support of MEW from the Minister and Deputy Minister down to field staff in each project province for the duration of each project. Provincial MEW staff facilitated the participatory planning processes by mobilising communities in project areas and discussing their requirements regarding rehabilitation of irrigation canals and water control structures. MEW staff also led conflict resolution processes, which usually arose at inopportune times during construction and which threatened to derail tight schedules. On many occasions, MEW staff remained on-site at construction locations when disputes reached a flashpoint.
- Was there good coordination and decision-making arrangements established among key partners?
- 74 At the commencement of 071 there were some disagreements and communication issues among stakeholders regarding problems with disbursement of funds, recruitment and work programmes. These issues were compounded by the lack of an M&E unit in the project during this period to produce evidence-based information to all key players. The team agreed to begin producing monthly progress reports, which helped inform all stakeholders and explain in-field delays in work programmes. Overall, there was good coordination arrangements established among the key stakeholders. MEW staff in Kabul, and the provincial offices of Bamyan and Kapisa actively participated in implementation of each projects' annual workplans.
- 75 The projects' designers did not envisage the necessity for a higher level coordination committee of stakeholders that would meet regularly to oversee project progress, discuss problems and issues, recommend actions and agree to future work plans for project teams. Such an institution provides a forum for discussion among stakeholders and decision-making, and would be able to quickly rectify any disagreements.
- 76 Each provincial project office was co-located with provincial MEW offices, which facilitated efficient coordination between the two main partners implementing the projects. Working

relationships between project teams and MEW staff both in Kabul and in the field was exemplary; and this institutional and implementation set-up was integral to achievement of effective results.

- 77 Provincial MEW staff were responsible for liaising with communities through Community Development Councils, Mirabs and individual water users. Farmers met during the mission in Kabul and Kapisa were satisfied with their involvement in the project from initial discussions and prioritisation of structures through to final sign-off of construction and handover to their responsibility. Communities selected individuals for training usually based on literacy skills, enthusiasm and willingness to attend training sessions or demonstrations and to pass on new knowledge and information to their neighbours. Training materials were adequately presented and pitched at levels easily understood by both farmers and MEW staff attending training courses. Beneficiary farmers considered they were adequately involved in all decision-making processes concerning construction, management, training and ownership of their irrigation infrastructure.
- Were there any implementation gaps and delays; if any, what are their causes and consequences on planned and implemented outputs?
- 78 Project designs generally over-estimate what could be achieved in the time available and under-estimate the security and capacity constraints relevant to Afghanistan. The causes for unintended delays of the projects included:
- Influential people in certain communities tried to reverse previously agreed procedures and responsibilities between the project teams and community members;
 - Some farmers were reluctant to abide by the agreed water stoppage schedules in order for rehabilitation construction to proceed, which hampered contractor work plans;
 - Communities raised ad hoc issues during construction that affected the pace of construction.
 - Animosity between villages often caused challenges in water release schedules in canals.
 - Slow decision making processes as some community leaders engaged in politicking.
 - Security affected staff movement (e.g. contractor threats to team members in Kapisa meant a pull-back of all staff to Kabul, and Kapisa activities were then managed from Kabul).
 - Inadequate numbers of qualified and competent construction companies - many contracts needed to be re-advertised due to insufficient numbers of bidders.
 - Winter season especially in Bamyan (only six month operational season) was harsh and slowed down initial survey work, community consultation processes and implementation.
- 79 Project teams and provincial MEW staff worked effectively to overcome these issues and minimise disruption through various local remedial actions. Project teams were well integrated into FAO Country Office security regimes and they followed all required security protocols, which were particularly important during field work.
- 80 An implementation gap in both projects was the oversight of upland rehabilitation in river catchments. Seriously degraded hillsides through deforestation, over-grazing and dryland cropping has led to excessive siltation and rock damage to lowland irrigation systems. The project contracted UNEP to utilise local labour and resources to rehabilitate the upper catchment of Shah Fulady Valley in Bamyan province¹⁷. While there were delays in fulfilling the contract, UNEP completed these important land rehabilitation activities in watersheds that could demonstrate the effectiveness of such interventions to ensure sustainability of water resources.
- 81 However, upland rehabilitation activities were not replicated in other project areas and were not included in the 077 project. This gap in implementation means that siltation and damage to built structures may continue to be a problem for many communities to overcome through their operations and maintenance duties, particularly for those with

¹⁷ UNEP terraced 40 ha, rehabilitated 15 ha rangeland, planted 120,000 poplar trees, constructed 120 check dams in tributaries to slow downhill water flows, rehabilitated 60 km of rural pathways, and trained 12 locals in conservation practices

canals bordering hill sides. Upland communities could be a valuable partner if they were adequately trained and resourced for land and water conservation purposes, which helps sustain their own livelihoods and assists operations and maintenance practices of valley farmers with irrigation.

3.4 Evaluation question 4. Are the projects' results sustainable beyond project conclusion?

Sustainability considerations were integrated throughout each project's design and implementation, based on building capacity of farmers to efficiently manage water and maintain the newly-built irrigation infrastructure, and MEW to be able to take over responsibility for implementing irrigation rehabilitation work in other areas. The sustainability of the skills base within MEW built by the projects maybe questionable due to the lack of opportunities for trained staff to utilise their new skills. Sustainability of some livelihood results may also be doubtful mainly due to a lack of access for beneficiaries in local areas to the improved inputs demonstrated in training courses.

- To what extent were sustainability considerations taken into account in the design and implementation of interventions?
- 82 Sustainability was a paramount issue in design of each project and during project implementation. The project aimed to upgrade the capacity of MEW to deliver services to rural households, and develop skills on the design of hydraulic structures, quality control of construction, surveying and other tasks in managing irrigation development programmes.
- 83 The project also aimed to develop capacities for water management at the field level by training Mirabs and community representatives in the operations and maintenance of upgraded irrigation canal structures. The objective of supporting Mirabs was to make the traditional water management system more efficient and effective in operations and maintenance of built water structures. Mirabs were involved from the outset in making key decisions on sections of canals to be rehabilitated and other necessary water control infrastructure. This demand-driven approach and the involvement of beneficiaries in all decision-making processes helped generate community ownership of the new structures, which contributed to sustainability of project results.
- 84 Capacity building of all project stakeholders also contributed to sustainability of project results. MEW staff were trained in a variety of topics – surveying and designing irrigation systems; procurement, construction and contract management; project management; social mobilisation and dispute resolution; utilising information and communications technologies; and operations and maintenance. These skills provide a solid basis to enable MEW staff to continue similar work on irrigation rehabilitation and water control interventions independently of project support in other watersheds.
- 85 The project-supported livelihood training and provision of resources targeted at women in rehabilitated command areas for small-scale enterprise development were likely to be sustainable. The interventions generally proved successful for women to generate some income from poultry, kitchen gardens, milk production etc. As these enterprises were based on low input-low output activities, beneficiaries should be able to maintain, and increase, their outputs. Other livelihood activities may be less sustainable. Drip irrigation demonstrations for orchards and vegetable production were popular activities. However, uptake was likely to be minimal due to the lack of an accompanying subsidy program or other provision in the project activities for supplying necessary equipment to farmers.
- 86 With no proper structures to regulate and withstand massive water flows during spring thaw, canal inlets were usually wiped out during every flood and farmers needed to spend time and energy to rebuild them, including cutting trees from surrounding areas. Project-built structures contributed to environmental sustainability, through improved water control and reduction in damage caused by floods to farmlands and other areas. Farmers no longer needed to cut the same number of trees to strengthen canal inlets, banks and locally-made diversion structures. Some rehabilitation work was completed in water-sheds

and hill-slopes in 071 to reduce erosion and soil run-off into irrigation canals, and assist with recharge of underground water reserves. UNEP delivered soil conservation and watershed rehabilitation results in Bamyán that were not replicated in other project areas or included in 077 project activities.

- Were exit strategies appropriately defined and implemented, and what steps have been taken to ensure sustainability of results?

87 The exit strategy of the final phase of the programme (077) was to continue to build MEW capacities to take-over responsibility of irrigation rehabilitation projects, without external support. However, due to lack of resources and follow-up training, most MEW trainees will not be able to build on the skill base they developed through the project and the sustainability of these capacity building efforts may be questionable. Low government salary scales also hinders the retention of skilled staff within the civil service. On-the-job training of farmers and MEW field staff was an important component of the exit strategy in order for local beneficiaries to properly manage and allocate their irrigation water supplies and provide ongoing maintenance to their improved irrigation infrastructure.

88 Other irrigation rehabilitation projects in Afghanistan have utilised salary top-ups and performance-based incentive schemes to compensate low-paying government positions for key team members with technical skills required for rehabilitation and construction work in an effort to retain skilled government staff. However, these schemes were controversial and created problems within government agencies. All development assistance projects aim to build government capacity in order for them to take over responsibility for project interventions. Nevertheless, sustainability of government capacity continued to be an issue with under-resourced ministries, such as MEW. The programme's exit strategy was to build capacities and provide resources to establish a skills base that would allow MEW to take responsibility for all stages of the irrigation rehabilitation cycle. Most interlocutors met during the mission believed MEW did not yet possess the necessary skill levels to complete such tasks independently.

- How did the development of partnerships at the national level contribute to sustainability of results?

89 Partnerships at the national level contributed to sustainability of results. The Government of Japan, FAO and MEW partnership was resilient throughout the programme over several years, which provided ongoing support to the project teams to deliver agreed results, deal with unintended consequences and produce sustainable outcomes for the benefit of local farming communities and MEW. However, tripartite meetings between the three key players never occurred, and thus, no forum existed to discuss project progress or important issues from each partner's perspective. The FAO Country Office was in an advantageous position to learn from previous experiences and adopt many sustainable practices into these projects' designs from other irrigation rehabilitation projects involving FAO in Afghanistan, such as the World Bank-funded Irrigation Restoration and Development Project.

4. Conclusions and recommendations

90 The following conclusions are inferred based on the findings of this final evaluation of the projects and on the evaluation questions (EQ).

4.1 Conclusions

Conclusion 1. (EQ.1) Through participative processes, the projects supported beneficiaries to increase their production and productivity of major crops, which is a key component of the government's development strategies that recognises the important role irrigated agriculture plays in meeting national food security goals and producing higher value crops.

91 By rehabilitating dilapidated irrigation infrastructure, the projects helped improve distribution, availability and equity of irrigation water supplies to farmers and contributed to the government's agricultural development objectives. The effective results from these projects helped reinforce FAO's reputation as a major contributor to improved irrigation systems in Afghanistan, contributed towards FAO's priority to support better water resource utilisation, irrigation development and management through improved infrastructure, and strengthened institutions. Livelihood support delivered effective localised results, but did not enhance widespread uptake of new or improved production systems and diversification of livelihoods among beneficiaries.

Conclusion 2. (EQ.2) Rehabilitation of irrigation and water control structures, and capacity building of government officials and beneficiaries delivered effective results, with downstream communities obtaining the most benefit through more equitable distribution of water allowing them to increase their land under irrigation and increase their productivity.

92 The results helped reduce the number of disputes between individuals and communities due to water access problems. The new structures also reduced the amount of time and resources that farmers needed to allocate for rebuilding and maintaining their irrigation canals. The projects trained farmers and Mirabs in more efficient water management, operations and maintenance in order to increase water availability, equity and reliability throughout the cropping season. The programme provided formal and in-field training to help build the capacity of MEW to take over responsibility for all activities in canal rehabilitation projects.

Conclusion 3. (EQ.3) Competent project teams able to work effectively in difficult operational environments and continuous support from all levels of MEW were the main factors contributing to effective outcomes.

93 An overlap between project durations meant the project team was able to remain largely intact and seamlessly continue project implementation, while also integrating Kapisa province into work plans. Unintended issues and problems beset all projects in Afghanistan which caused disruptions to work schedules, but which project teams adeptly worked through in order to maintain sub-project schedules and budgets. The main implementation gaps were minimal efforts devoted to livelihoods support aimed at encouraging beneficiary households to diversify their livelihood activities; and land rehabilitation works in upland watershed areas in project provinces.

Conclusion 4. (EQ.4) Newly built water control infrastructure will be sustainable provided farmers practice regular maintenance, although skills in MEW built through the projects may be less sustainable due to a lack of resources and opportunities for staff to consolidate their skills.

94 The design targeted Mirabs as the lead players to involve in initial discussions with farmers to prioritise areas of canal rehabilitation, oversight of construction, operations and maintenance, with the specific objective that Mirabs and farmers would take over ownership of the newly-built structures. Sustainability of skills capacity in MEW will be

dependent on the extent to which trainees can utilise their new skills within their work programmes and/or attend refresher courses that would help consolidate their skills base. Beneficiaries will likely continue those improved or new livelihood practices which provide increased incomes, whereas other new livelihoods promoted by the projects, such as mushroom production or drip irrigation will likely be unsustainable due to a lack of input supplies. Sustainability was an important consideration in both the design and implementation of project interventions, and the programme exit strategy.

4.2 Recommendations

95 The following recommendations are proposed based on the findings of this final evaluation of the projects and on the evaluation questions (EQ).

Recommendation 1. (To FAO and donors of projects supporting food security objectives). Irrigation rehabilitation projects need to include well-designed livelihoods support activities that promote efficiency gains and agricultural diversification.

96 For food security projects such as these FAO-implemented irrigation rehabilitation projects, more support was required to encourage beneficiaries to diversify their farming systems and enhance their livelihood resilience. Neither project team had livelihood support staff, nor any team member specifically responsible for managing livelihood support activities. The projects assumed that by increasing production of wheat in the project areas, then incomes would increase and beneficiary household livelihoods would improve. This was a proven scenario from other irrigation rehabilitation projects in Afghanistan, and the assumption was valid.

97 Diversification and higher productivity would also be assisted through supporting farmers to grow higher value crops, such as fruits and vegetables. Farmers in Kapisa and Kabul have potential market opportunities in the high demand fresh produce city markets of Kabul. The 077 project design included a marketing consultant to assess and recommend possible livelihood interventions that could be supported by the project in order to provide higher impact for farmers in rehabilitated command areas. This consultancy did not occur and the programme consisted of mostly irrigation engineering interventions.

98 Although each project design considered that linkages could be achieved through these projects with other FAO-implemented projects in common areas to support livelihood enhancement, the design did not explain how such linkages would work and project teams did not explore such collaborations. The project designers also considered cooperation between MEW and MAIL would be important for MAIL to deliver on-farm livelihood support for farmers. This inter-ministry cooperation also did not occur and thus, the most practical means for the projects to implement livelihood activities was to hire local NGOs to deliver these interventions. While the results delivered by the contracted NGOs were impressive, funding was insufficient to meet the total demand for such support from other farming households in local areas.

99 Farmers will continue to grow wheat and Afghanistan's food security will remain largely dependent on irrigated wheat production. Therefore, training and demonstrations of improved cereal production practices aimed at increasing wheat production should be important livelihood activities. The projects' design considered diversification of beneficiary livelihoods would be critical to raising household resilience and increasing incomes, which will become more critical as weather systems change and production patterns become more unpredictable. Farmers will need to become more flexible and adaptable in cope with less stable weather conditions.

100 Food security projects should devote 25-30 percent of their budget to livelihood support activities, which need to extend beyond training and demonstrations. Assessments of market opportunities should be conducted soon after project commencement to inform the type of livelihood support that would provide most impact to beneficiaries. Farmers are inherently risk-averse and therefore, subsidised production inputs and on-farm back-up technical support are required to assist farmers adopt new or improved production

systems. For example, the demonstrations of orchard drip-irrigation systems generated high demand from farmers who wanted to install similar systems on their farms yet without any scheme for supplying the necessary equipment, uptake was negligible. One drip irrigation demonstration farmer had brought previous fallow land into orchard production through the more efficient drip irrigation system and thus, the promotion of higher efficiency irrigation systems produced a two-fold outcome: increased production of higher value produce and increased areas under irrigation.

Recommendation 2. (To FAO, MEW and donors supporting irrigation rehabilitation projects). Watershed restoration and rehabilitation activities should be an integral part of all irrigation rehabilitation projects.

- 101 The budget allocation for land restoration activities in 071 was provided to UNEP and watershed rehabilitation activities were not implemented in other areas. It was not clear whether these experiences influenced the decision not to implement similar land restoration activities in other upland areas in 077. Land restoration will become more important as MEW adopts its operations to follow IWRM principles and establishes RBA and sub-councils for future management of irrigation systems on a watershed basis in Afghanistan.
- 102 Watershed rehabilitation should be considered an important component of irrigation rehabilitation projects. More effort is needed in watershed restoration activities to redress the severe land and water degradation that has occurred in Afghanistan and complement the work of irrigation canal rehabilitation. An improved natural environment within watersheds will help stabilise unstable ground, reduce siltation and rock damage to irrigation structures in valley irrigation systems and improve the sustainability of local water resources. Terracing, reforestation, check dams and restoration of grasslands would assist upland farming communities reliant on access to natural resources for their livelihoods and help with recharging subterranean water reservoirs. Climate change is predicted to affect Afghanistan's seasonality by shortening the winter season and causing shorter more intensive rainfall periods. Land restoration will become an important element in helping to ameliorate the effects of these changing weather patterns.

Recommendation 3. (To FAO, donors and designers of irrigation rehabilitation projects). Irrigation rehabilitation interventions need to be designed with longer duration and include effective M&E systems from project commencement to enable regular monitoring of performance and to inform timely programme adjustments.

- 103 Irrigation projects with large budgets and implemented in complex operational environments, such as Afghanistan, need to be three to four years duration. The Mid-Term Evaluation of 071 in February 2014 noted that the donor expected funds would be disbursed evenly over a two-year period. However, this was impractical due to the length of time taken to complete the initial river basin surveys and water control infrastructure designs, prepare tenders and contract companies for rehabilitation works. Fund disbursement during this period was minimal. Such over-expectations need to be addressed at the project design stage, yet each of the project designs generally over-estimated what could be achieved in the time available and under-estimated the security and capacity constraints of all stakeholders.
- 104 Special attention at project commencement needs to ensure all project units are in-place so that projects can be implemented as planned. The lack of an M&E unit at the start of 071 and no monitoring framework was a serious oversight and probably contributed to progress reports not alerting the donor to implementation delays in some project activities. Proper monitoring of activities to provide data for analytical assessments of project progress informs decision-making on future activities. An M&E unit was eventually established in early 2015, and a baseline completed in mid-2015. This allowed only one season of production results to be recorded in the 071 terminal report, and two seasons for the 077 terminal report. These time periods were too short to accurately reflect the impact of the projects on production and productivity of beneficiaries¹⁸.

¹⁸ The ideal option would have been for the baseline study to be completed at the commencement of Phase 1 of the programme.

- 105 In view of the inherent complexities of irrigation rehabilitation projects in Afghanistan, rigorous M&E practices are essential to inform of impending problems and implementation of timely adjustments to project workplans in order to maximise achievement of intended results.

Recommendation 4. (To FAO as the implementing partner of irrigation rehabilitation projects). Capacity building activities of government staff should be based on an assessment of needs, available resources (before and after project) and aim to build applicable skills to ensure sustainability of results.

- 106 Capacity building of government institutions needs to be targeted at practical and sustainable outcomes. Both projects provided effective training and mentoring in the field for all stakeholders to competently manage, operate and maintain rehabilitated water control structures. Farmers and WMD staff could readily use these skills on more efficient management operations and maintenance of irrigation infrastructure, which had a direct impact on their livelihoods. More formal training courses in Afghanistan and abroad did not always transfer into useful skills for MEW staff that would assist them in their daily work. Some MEW staff met during the mission voiced their appreciation at attending courses and learning technical skills, such as surveying, designing irrigation structures, GIS mapping etc., but they were frustrated on return to their offices as that they could not immediately utilise their newly-acquired skills due to a lack of equipment. Without an opportunity to use these practical skills in their work, these MEW staff will likely quickly lose these skills.

- 107 The 077 terminal report stated that:

“MEW had made commendable efforts in identifying training areas and selecting relevant staff to participate in capacity building programmes in-country as well as overseas. The project achieved its target as per the plan outlined in the project document. At this juncture, MEW is expected to vigorously maintain the momentum of the capacity built among its staff members by arranging in-house refresher course on a regular basis.”

It is doubtful that MEW has the resources or capacity to organise sufficient in-house training to maintain the skills of their staff members in the variety of technical skills built-up through their involvement in these projects. Therefore, project teams should critically assess the capacities and resources of government agencies, before- and after-project, and align training courses and equipment purchases accordingly, so that learned skills can be readily applicable to work areas of government staff involved in project implementation.

- 108 The top echelons at MEW considered their staff should be more involved in the technical aspects of irrigation rehabilitation projects and lead in surveying, designing and constructing these works. Once staff had been adequately trained, they suggested projects should use salary supplements or incentive payment schemes as a means to retain skilled staff in donor-funded, government-implemented projects. Such payment schemes were used in other irrigation projects within MEW, which had managed to retain skilled staff members. However, these schemes were controversial, did not provide a sustainable solution and were not supported by the Ministry of Finance. In addition, for these FAO irrigation projects with these sized budgets and durations, such payment schemes would not be practical or sustainable.

Recommendation 5. (To FAO as the implementing partner and designers of irrigation rehabilitation projects). GIS should be considered a necessary tool to support evidence-based decision-making, and more accurate monitoring and assessment of project progress and results.

- 109 GIS monitoring and evaluation of project progress needs to be included from commencement of irrigation support projects. Irrigation rehabilitation projects suffer from a lack of regular monitoring and evaluation. As the primary purpose of monitoring was to achieve efficient and effective project performance, GIS should be an integral part of the Management Information System and a regular internal activity in any irrigation project. Regular and reliable evaluation of irrigation agricultural projects is not an easy task within the operational environment of Afghanistan.

- 110 There are methodological problems in developing cost-effective and reliable approaches that can be used with the resources and expertise available. GIS would assist in overcoming these problems and help establish baselines, monitor project progress, identify limitations, assist with work planning, and increase the irrigation potential of rehabilitated systems. There are several open source GIS software programmes and geospatial data is freely available. These solutions may now guarantee a more cost-effective and sustainable approach with the cost to projects reduced to capacity building and human resources.
- 111 These projects demonstrated GIS effectiveness in mapping existing and incremental increases in command areas following project interventions. This was demonstrated in Kapisa where team's GIS mapping results proved the project design targets for increased irrigation command areas were excessive. But GIS can also be utilised more broadly for multiple tasks and monitoring indicators to provide an array of performance evaluation information – realisation of irrigation potential, production and productivity improvements (maximisation of crop yields), changes in land use (uptake of higher value crops), efficient management of irrigation water, improvements or deterioration (salinity, water-logging) in irrigated lands. Such monitoring and evaluation data will become more critical as MEW follows IWRM management principles and adopts watershed management approach to implement projects.
- 112 These projects started the GIS capacity building process in MEW but more support would be required before MEW could possess a functional GIS monitoring unit. Skilled GIS technicians were in high demand and often difficult to recruit for development assistance projects. Therefore, designers of agricultural irrigation projects should allocate sufficient funds to employ external GIS monitoring services that can complement any information provided by in-house GIS technicians, and provide a wide selection of monitoring and evaluation information relevant to irrigation rehabilitation projects to assist accurate decision-making processes.

Recommendation 6. (To FAO as the implementing partner and designers of irrigation rehabilitation projects). Gender inclusiveness in irrigation rehabilitation projects should be addressed through targeting women's participation in project livelihood activities.

- 113 The most effective means to incorporate gender inclusiveness in agricultural irrigation projects in Afghanistan is through livelihood support interventions for beneficiary farming households that specifically target the livelihood activities of women, such as poultry, dairying, kitchen gardens, fruit and vegetable processing. The NGOs contracted by the projects to implement livelihood interventions demonstrated the demand from women in project communities for such livelihood activities, which were enhanced through their use of female trainers where possible. As women were mainly responsible for household nutrition, then all such livelihood support activities should be accompanied by nutrition training to increase knowledge and help reinforce the connection between women diversifying household livelihoods and improving family nutrition.

5. Lessons Learned

- 114 **Lesson 1.** Further production and productivity gains are possible with upgraded and rehabilitated irrigation systems beyond the gains already produced by the projects. With a focus on wheat production as the primary impact indicator, the projects mostly overlooked other possible gains such as promoting the use of higher quality inputs for cereal production (seed, fertiliser), improved production cycles, more diversified crop production, or use of on-farm higher efficiency irrigation systems.
- 115 **Lesson 2.** Monitoring canal water flows would help measure improvements or deterioration in water management systems, aid detection of major water seepage areas and assist with planning interventions to further improve efficiency gains in rehabilitated irrigation systems. Surveying farmers about command areas prior to project interventions does not provide accurate data and actual irrigated areas varies each year. GIS monitoring of irrigation systems at a both watershed and local community-scale should be an important tool for monitoring project progress, activity planning and implementation to drive higher efficiency water management.
- 116 **Lesson 3.** Considering the complexity of the operational environment in Afghanistan and the expected outputs in these projects, irrigation rehabilitation projects of the size included in each phase of this programme must be 3-4 years duration.
- 117 **Lesson 4.** Contracting local NGOs to deliver livelihood support activities and integrate women into the programme produced effective results. Alternative support mechanisms proposed in each project design, such as collaborations with other FAO projects in common locations and partnerships with MAIL proved impractical for delivering livelihood results.

Appendices

Appendix 1. List of people met

Name	Designation	Institution
Ali Ahmad Osmani	Minister	MEW
Mohammad Daoud Qazizada	Deputy Minister	MEW
Mahmood Zahiri	Head, Kapisa River Basin Authority	MEW
Amin Zaki	Acting Director, Water Management, Kapisa	MEW
Fazulhaq Bakhtari	Director, Water Resources Department	MEW
Shankracharya	Chief Technical Advisor	FAOAF
Subedi Kulendra Nath	Senior Irrigation Engineer	FAOAF
Azmi Eid Mohammad	Head M&E Unit	FAOAF
Mohammad Jabarkhil	National M&E officer	FAOAF
Mir Hamidullah Sadat	Auto CAD Expert	FAOAF
Fareed Ahmad Azizi	Dep. Director, Kabul River Basin Authority	MEW
Abdul Maroof Maseer	General Director, Kabul River Basin Authority	MEW
Abdul Ghafour Hedayat	Director of Kabul Sub-River Basin Authority	MEW
Bakhtyar Saleem	Team Leader/Engineer, Kapisa Project Unit	FAOAF
Tomio Shichiri	FAO Representative	FAOR
Moeen Ud Din Siraj	Operations Officer	FAOR
PuspaRaj Kanal	Lead Technical Officer	FAORAP
Haroon Khawar	Program Manager	JICA
Lorenzo DeSimone	DDNS	FAO
Marcelo Rezende	Forest Policy and Resources Division	FAO
Danilo Mollicone	Forest Policy and Resources Division	FAO

Appendix 2. Documents Consulted

- AFS (2016) Final Report, Vegetable production and processing, and installation of drip irrigation units in Qarabagh, Farza and Kalakan districts of Kabul province
- FAO (2011) Project Document. The Programme for Improvement of Irrigation Systems in Kabul and Bamyan Provinces: GCP/AFG/071/JPN
- FAO (2012) Project Document: The Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces of Afghanistan: GCP/AFG/077/JPN
- FAO (2012) Emergency Irrigation Rehabilitation Project (EIRP) Afghanistan. UTF/AFG/035/AFG. OED Rome.
- FAO (2014) The Programme for Improvement of Irrigation Systems in Kabul and Bamyan Provinces, GCP/AFG/071/JPN, Mid-term Evaluation Report. OED Rome.
- FAO (2014) Evaluation of FAO's Cooperation in Afghanistan 2007-2012. OED Rome.
- FAO (2015) The Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces of Afghanistan (GCP/AFG/066/JPN, GCP/AFG/071/JPN and GCP/AFG/077/JPN) Baseline Survey. Kabul.
- FAO (2016) Cluster evaluation of: Strengthening the Role of Women in Agriculture Development for Improved Household Food Security, Strengthening Policy Development and Coordination for Food and Nutrition Security in Afghanistan, Support to Extension Systems, Household Food and Livelihood Security. OED Rome.
- FAO (2016) Results of an Impact Survey of The Programme for Improvement of Irrigation Systems in Bamyan, Kabul and Kapisa Provinces, Afghanistan :(GCP/AFG/066/JPN, GCP/AFG/071/JPN and GCP/AFG/077/JPN), Kabul
- FAO (2016) The Programme for Improvement of Irrigation Systems In Kabul and Bamyan Provinces. Terminal Report GCP/AFG/071/JPN, Kabul.
- FAO (2017) The Programme for Improvement of Irrigation Systems in Kabul, Bamyan and Kapisa Provinces (GCP/AFG/077/JPN) Terminal Report, Kabul
- FAO (2017) Impact Assessment Report for the Programme for Improvement of Irrigation Systems: GCP/AFG/077/JPN
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- RMO (2015) Activities in Final Progress Report (Bamyan)
- RMO (2015) Activities in Final Progress Report (Kapisa)
- Samuel Hall (2012). Social Assessment of the National Horticulture and Livestock Project (NHLP). Paris
- Shahriar Pervez, M., Budde, M., Rowland, J. (2014). Mapping irrigated areas in Afghanistan over the past decade using MODIS NDVI. US Geological Survey, Lincoln
- World Bank (2016). Revised Project Appraisal Document for the Irrigation Restoration and Development Project.
- World Food Programme (2016) Country Brief: Afghanistan

Appendix 3. Map of Programme Area

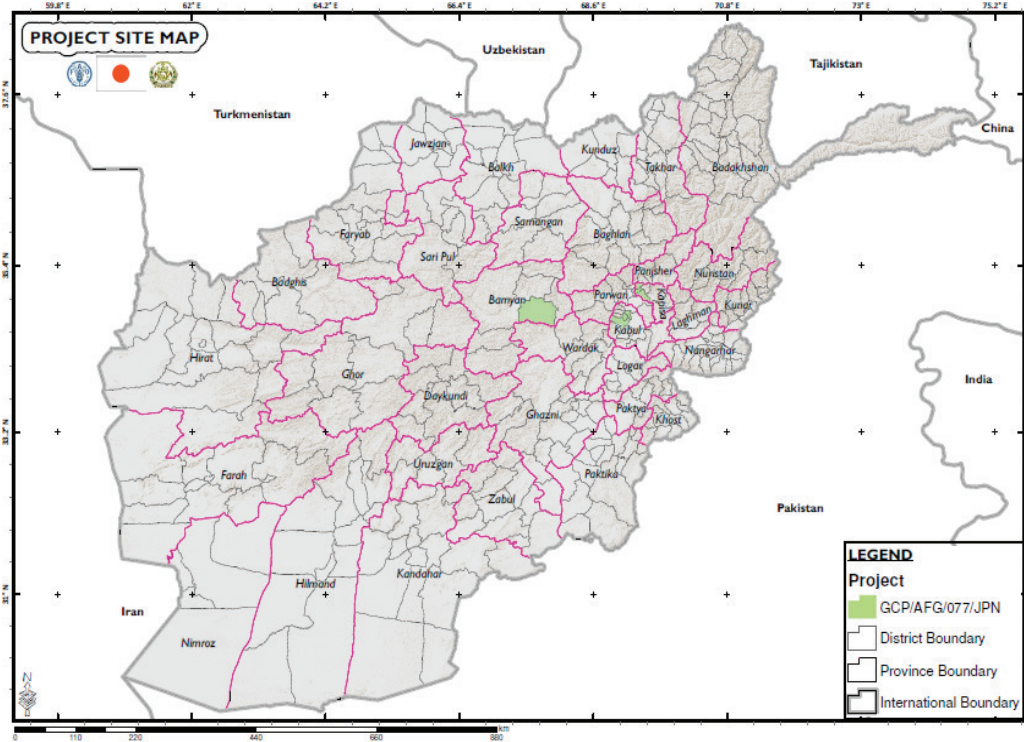


Figure 3. Programme intervention areas in Kabul, Kapisa, Bamyan



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