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IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF-A0465

ON A

GRANT

IN THE AMOUNT OF US\$38.00 MILLION

TO THE

KYRGYZ REPUBLIC

FOR THE

AGRICULTURE PRODUCTIVITY AND NUTRITION IMPROVEMENT PROJECT

December 19, 2023

Water Global Practice  
Europe and Central Asia Region

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CURRENCY EQUIVALENTS  
(Exchange Rate Effective June 30, 2023)

Currency Unit = Kyrgyz Som (KGS)

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KGS 87.2267= US\$1

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US\$ 0.1146 = KGS 1

FISCAL YEAR  
July 1 - June 30

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## ABBREVIATIONS AND ACRONYMS

AA	Local Government Area ( <i>Aiyl Aimak</i> )
ADB	Asian Development Bank
ADP	Agricultural Development Plan
AISP	Agricultural Investment and Services Project
AO	Local Government ( <i>Aiyl Okmotu</i> )
APAP	Agricultural Productivity Assistance Project
APNIP	Agricultural Productivity and Nutrition Improvement Project
ASSP	Agricultural Support Services Project
COVID-19	Coronavirus Disease 2019
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
CSF	Community Seed Fund
DWLRI	Department of Water Resources and Land Improvement
EFA	Economic and Financial Analysis
EG	Expert Group
EMP	Environmental Management Plan
ENPV	Economic Net Present Value
ERR	Economic Rate of Return
FAO	Food and Agriculture Organization of the United Nations
FCS	Food Consumption Score
FM	Financial Management
FSC	Food Security Council
FSN	Food Security and Nutrition
FWUA	Federation of Water User Associations
GAFSP	Global Agriculture and Food Security Program
GDP	Gross Domestic Product
GRM	Grievance Redress Mechanism
HLO	Higher-Level Objective
I&D	Irrigation and Drainage
ICR	Implementation Completion and Results Report
IPM	Integrated Pest Management
IYCF	Infant and Young Child Feeding
KADK	Kyrgyz-aiyldik-den-Sooluk Committee
M&E	Monitoring and Evaluation
MTR	Midterm Review
NSC	National Statistical Committee
O&M	Operations and Maintenance
OIP	On-Farm Irrigation Project
OIP-2	Second On-Farm Irrigation Project
PAD	Project Appraisal Document
PDO	Project Development Objective
PIU	Project Implementation Unit
SHG	Self-Help Group
VHC	Village Health Committee

WFP	World Food Programme
WRA	Women of Reproductive Age
WRS	Water Resources Service
WSU	WUA Support Unit
WUA	Water User Association

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**DATA SHEET**

**BASIC INFORMATION**

**Product Information**

Project ID	Project Name
P132754	AGRICULTURE PRODUCTIVITY AND NUTRITION IMPROVEMENT PROJECT
Country	Financing Instrument
Kyrgyz Republic	Investment Project Financing
Original EA Category	Revised EA Category
Partial Assessment (B)	Partial Assessment (B)

**Organizations**

Borrower	Implementing Agency
Ministry of Finance	Water Resource Service

**Project Development Objective (PDO)**

Original PDO

The proposed project development objective is to increase agricultural productivity and food and nutrition security of rural households in selected areas nationwide.

PDO as stated in the legal agreement

The Proposed Project Development Objective is to increase agricultural productivity, and food and nutrition security of rural households in selected areas of the Recipient's territory.



**FINANCING**

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
<b>World Bank Financing</b>			
TF-A0645	38,000,000	38,000,000	38,000,000
<b>Total</b>	<b>38,000,000</b>	<b>38,000,000</b>	<b>38,000,000</b>
<b>Non-World Bank Financing</b>			
Borrower/Recipient	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Project Cost</b>	<b>38,000,000</b>	<b>38,000,000</b>	<b>38,000,000</b>

**KEY DATES**

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
11-Dec-2015	14-Sep-2016	22-May-2020	30-Jun-2022	30-Jun-2023

**RESTRUCTURING AND/OR ADDITIONAL FINANCING**

Date(s)	Amount Disbursed (US\$M)	Key Revisions
21-May-2020	18.00	Change in Results Framework Change in Components and Cost
24-Feb-2022	32.32	Change in Loan Closing Date(s)

**KEY RATINGS**

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

**RATINGS OF PROJECT PERFORMANCE IN ISRs**

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	02-Mar-2016	Satisfactory	Satisfactory	0
02	03-Oct-2016	Satisfactory	Moderately Satisfactory	0





03	19-Apr-2017	Moderately Satisfactory	Moderately Satisfactory	2.54
04	01-Nov-2017	Moderately Satisfactory	Moderately Satisfactory	3.39
05	11-May-2018	Moderately Satisfactory	Moderately Satisfactory	4.10
06	03-Jan-2019	Moderately Satisfactory	Moderately Satisfactory	8.65
07	29-Jun-2019	Moderately Satisfactory	Moderately Satisfactory	11.98
08	18-Dec-2019	Moderately Satisfactory	Moderately Satisfactory	15.63
09	17-Jun-2020	Moderately Satisfactory	Moderately Satisfactory	18.59
10	08-Dec-2020	Moderately Satisfactory	Moderately Satisfactory	21.85
11	02-Feb-2021	Moderately Satisfactory	Moderately Satisfactory	22.48
12	23-Jul-2021	Moderately Unsatisfactory	Moderately Unsatisfactory	26.07
13	05-Jan-2022	Moderately Unsatisfactory	Moderately Satisfactory	29.65
14	07-Apr-2022	Moderately Satisfactory	Moderately Satisfactory	33.67
15	29-Sep-2022	Satisfactory	Moderately Satisfactory	37.64
16	23-Dec-2022	Satisfactory	Moderately Satisfactory	37.64
17	26-Jun-2023	Satisfactory	Satisfactory	38.00

**SECTORS AND THEMES**

**Sectors**

Major Sector/Sector (%)

**Agriculture, Fishing and Forestry 80**

Agricultural Extension, Research, and Other Support Activities 20

Irrigation and Drainage 60

**Health 20**

Health 20

**Themes**

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)



<b>Private Sector Development</b>	<b>100</b>
Jobs	100
<b>Human Development and Gender</b>	<b>30</b>
Nutrition and Food Security	30
Nutrition	15
Food Security	15
<b>Urban and Rural Development</b>	<b>40</b>
Rural Development	40
Rural Infrastructure and service delivery	40
<b>Environment and Natural Resource Management</b>	<b>30</b>
Water Resource Management	30
Water Institutions, Policies and Reform	30

**ADM STAFF**

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## I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

### CONTEXT AT APPRAISAL

#### Context

1. **Country background: In 2014, the Kyrgyz Republic was one of the poorest economies in the Europe and Central Asia Region with an estimated per capita Gross National Income (GNI) of US\$1,250.** However, Gross Domestic Product (GDP) growth was projected to average 5.4 percent in 2013–2015. In 2014, 31 percent of the population of about 6 million lived below the poverty line, including 1.2 percent in extreme poverty, with the incidence higher in rural (around 40 percent) than in urban areas (28 percent). Limited employment opportunities led many people (up to 40 percent of the working population), mostly men, to seek better job prospects elsewhere, largely in the Russian Federation. The Government was deposed in April 2010, which was followed by intercommunity violence in June 2010 in the southern region, but presidential elections in the fall of 2012 increased stability and improved governance before project appraisal in 2015.

#### Sector Context

2. **Agriculture and Irrigation: The agricultural sector generated about one-fifth of the country's GDP and one-third of employment in 2014.** Crop production was dominated by small-scale irrigation that covered around 82 percent of the 1.3 million ha of agricultural land.<sup>1</sup> The distribution of collective farmland to households in the mid-1990s, irrigation reform, development of rural financial markets, and privatization and liberalization of input and output markets led to agriculture sector growth that was variable but averaged a creditable 3.7 percent from 1996 to 2015. Nevertheless, agricultural production still faced major constraints, including poor access to reliable irrigation, low usage of quality seed, and low rates of machinery replacement and was particularly subject to natural hazards such as droughts, floods, and landslides. The lack of maintenance of irrigation and drainage (I&D) systems since the 1990s and their consequent deterioration due to inadequate government finance was a major concern. To address this issue, autonomous farmer-led water user associations (WUA) were established starting in 1997, and a Law on WUAs was passed in 2002. The World Bank-financed On-Farm Irrigation Project (OIP) and Second On-Farm Irrigation Project (OIP-2)<sup>2</sup> supported the establishment of 481 WUAs<sup>3</sup> covering the whole country, rehabilitated on-farm and off-farm I&D systems,<sup>4</sup> helped establish WUA Support Units (WSUs) under the Department of Water Resources and Land Improvement (DWRLI) of the Ministry of Agriculture and Land Improvement<sup>5</sup>. However, as of 2015, only 44 percent of off-farm and 21 percent of on-farm I&D systems were covered.<sup>6</sup> Crop yields were low, but improved on-farm water delivery and better agronomic practices had the potential to increase productivity. The OIP indicated that crop yields under rehabilitated I&D systems were between 10 and 20 percent higher than those without improved irrigation.<sup>7</sup> Under the Asian Development Bank (ADB)-financed Agriculture Area Development Project, farmers trained by advisory services exceeded the average yields of all farmers across seven crops by 62 percent.<sup>8</sup>

3. **Food and Nutrition Security: Irrigated agriculture was a major factor affecting rural income and food security, with most households depending on crop and livestock sales from which they earned more than one-third of their**

<sup>1</sup> Irrigation is critical due to low and variable rainfall averaging 200–600 mm in the north and 350–700 mm in the south.

<sup>2</sup> On-Farm Irrigation Project (OIP) (P049723, June 2000–June 2013) and OIP-2 (P096409, June 2007–June 2016).

<sup>3</sup> Each WUA employed around nine staff, thus generating around 4,000 permanent jobs throughout the country.

<sup>4</sup> Federations of WUAs (FWUAs) were also established to manage some of the off-farm systems.

<sup>5</sup> The DWRLI within the Ministry of Agriculture and Land Improvement was transferred to a new State Water Resource Agency, called the Water Resources Service, on July 30, 2019, pursuant to Government Resolution No.383.

<sup>6</sup> The Project Implementation Unit (PIU) of the OIP-2 (P096409) had received additional requests from 97 WUAs to rehabilitate their I&D systems covering 184,000 ha.

<sup>7</sup> Independent Impact Assessment Survey for OIP (P049723), January 2013.

<sup>8</sup> Asian Development Bank. 2011. *KGZ: Agriculture Area Development Project: Project Completion Report*.



**income.**<sup>9</sup> Household food insecurity was high, fluctuated substantially, and was more prevalent in rural areas (6–10 percent in the north and 10–20 percent in the south in 2014).<sup>10</sup> Most food-insecure households relied on a single income and had small household plots (average 0.16 ha) and few livestock. Food insecurity was a major reason for high levels of undernutrition or stunting in young children. At project appraisal, the estimated population suffering from dietary energy deficiency was 6 percent; 43 percent of children under five years and 39 percent of women of reproductive age (WRA) were diagnosed with iron deficiency anemia, and 13 percent of children under five years were suffering from chronic malnutrition. The diet of the poor was characterized by low diversity,<sup>11</sup> further undermining their nutritional status.

#### Rationale for World Bank Involvement

**4. The Agricultural Productivity and Nutrition Improvement Project (APNIP) was designed with grant financing from the Global Agriculture and Food Security Program (GAFSP) to address issues in agriculture, irrigation, and nutrition in line with the Government of Kyrgyz Republic (GoK), World Bank, and GAFSP priorities.**<sup>12</sup> The project design was built on the World Bank's long-term program for I&D rehabilitation and development of the WUA approach<sup>13</sup> in the Kyrgyz Republic. The APNIP's advisory services component was built on the long-term engagement of the World Bank and other development partners for the establishment of a nationwide network of financially independent rural advisory services.<sup>14</sup> The nutrition improvement component followed on from existing interventions delivered through the Community Action for Health Program and the country-wide partnership between the health system and Village Health Committees (VHCs), while the domestic gardening program adopted some of the practices under previous World Bank projects,<sup>15</sup> including the revolving Seed Funds and women's self-help groups (SHGs). Accordingly, the World Bank was particularly well-placed to continue its involvement in these sectors under the APNIP.

#### Contribution to Higher-Level Objectives

**5. The APNIP was aligned with the World Bank Country Partnership Strategy (CPS) for the Kyrgyz Republic for 2014–2017,**<sup>16</sup> which recognized the important role of water resource management and agricultural productivity as well as maternal and child health care for improving livelihoods of women and children. The project also contributed to the World Bank goals to reduce extreme poverty and promote shared prosperity. The I&D rehabilitation coupled with agricultural advisory services aimed to improve agricultural productivity and thus contribute to increasing food security. The provision of advisory services and educational campaigns for increased production and utilization of nutritious food and targeted micronutrient and vitamin supplements aimed to improve nutrition and food security of the rural poor and vulnerable groups. The improved coordination of food and nutrition security at the national level also contributed to this objective.

**6. The APNIP was fully aligned with national priorities consistent with the GoK's policies and strategies for agriculture, food, and nutrition security,** reflected in the National Sustainable Development Strategy 2013–2017,<sup>17</sup>

<sup>9</sup> World Bank, Kyrgyz Republic Poverty Assessment, October 2007, Report No. 40864-KG.

<sup>10</sup> World Food Programme (WFP) assessments of food security incidence were 27 percent (August 2010), 46 percent (March 2011), 18 percent (August 2011), 18 percent (March 2012), 25 percent (September 2012), 14 percent (September 2013), and 10 percent in 2014.

<sup>11</sup> Diet was characterized by high consumption of wheat, potato, and sugar and by low consumption of nutrient dense food, such as meat, milk, and their products.

<sup>12</sup> GAFSP priorities are to improve agricultural productivity, increase incomes, and ensure food and nutrition security.

<sup>13</sup> Including OIP-1 (P049723) and OIP-2 (P096409).

<sup>14</sup> Including the Agricultural Support Services Project (ASSP) (P040721, May 1998–January 2013) and Agricultural Investments and Services Project (AISP) (P096993, April 2008–April 2016).

<sup>15</sup> Including the Agricultural Productivity Assistance Project (APAP) (P118838, June 2011–August 2016).

<sup>16</sup> World Bank Country Partnership Strategy Report No. 78500-KG, June 2013.

<sup>17</sup> <http://www.donors.kg/en/strategy/172-national-sustainable-development-strategy-2013-2017>.



the Concept of Food Security of the Kyrgyz Republic 2009–2019,<sup>18</sup> and the Food Security and Nutrition Program 2014–2017.<sup>19</sup> Agriculture was considered essential for economic development, and a comprehensive approach was expected to help reduce social tensions and provide solutions for rural development. A key medium-term policy was ensuring food safety through increases in domestic production and productivity in agriculture and by creating reserves. In food and nutrition security, the GoK aimed to provide all citizens with permanent access to sufficient food and had established a national-level Food Security Council (FSC) responsible for coordinating food security issues.

### Theory of Change (Results Chain)

7. The APNIP sought to rehabilitate the I&D infrastructure of selected WUAs to provide more reliable and equitable irrigation and contribute to increased crop production. To enhance benefits, the project also sought to strengthen the WUAs' capacity to provide services and WUA members' capacity to adopt improved crop management techniques through training and provision of small grants for machinery, quality seeds, and fertilizers. Further, to ensure that benefits were evenly distributed and improve household nutrition, the project sought to enhance the productivity of household plots and introduce nutrition programs aimed at vulnerable groups. The underlying assumption was that improved access to irrigation water would raise the production of field crops, cash crops, and nutritious vegetable and fruit crops, and along with the parallel agricultural advisory services and nutrition activities, lead to improved food availability, incomes, and nutrition at the household level. These activities would contribute to the project's objectives to increase agricultural productivity and food and nutrition security of rural households. The Implementation Completion and Results Report (ICR) team developed the Theory of Change shown in Annex 8, as this was not required during project preparation.

### Project Development Objectives (PDOs)

8. **The PDO, as stated in the Grant Agreement, is to increase agricultural productivity and food and nutrition security of rural households in selected areas of the Recipient's territory.**<sup>20</sup> The formulation in the Project Appraisal Document (PAD) was almost identical, referring to 'selected areas nationwide', while the Grant Agreement used more precise language, 'selected areas of the Recipient's territory'.

### Key Expected Outcomes and Outcome Indicators

9. The PDO achievement was to be measured through the following PDO indicators:
- Average increase in crop production for WUAs (with completed I&D and advisory services) (percent)
  - Water users provided with new/improved irrigation and drainage services (number)
  - Water users provided with irrigation and drainage services - female (number)
  - The proportion of households with food consumption score (FCS) above 28.5 points (percentage)

### Components

10. The project, as appraised, had four components as follows:

11. **Component 1: Rehabilitation and Modernization of Irrigation and Drainage Infrastructure** (estimated US\$28.0 million, actual at closing US\$26.26 million<sup>21</sup>). This component included (a) civil works for the rehabilitation and modernization of selected existing I&D infrastructure systems, (b) provision of essential maintenance equipment to

<sup>18</sup> <https://www.gafspfund.org/sites/default/files/inline-files/%24Food%20Security%20Concept%20for%202009-2019.pdf>.

<sup>19</sup> [http://assets.fsnforum.fao.org.s3-eu-west-](http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/files/FSN_ECA/fsn_programme_kgz/FSN_Programme_Kyrgyzstan_EN.pdf)

[1.amazonaws.com/public/files/FSN\\_ECA/fsn\\_programme\\_kgz/FSN\\_Programme\\_Kyrgyzstan\\_EN.pdf](http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/files/FSN_ECA/fsn_programme_kgz/FSN_Programme_Kyrgyzstan_EN.pdf).

<sup>20</sup> Grant Agreement between the Kyrgyz Republic and International Development Association acting as Trustee of the Global Agriculture and Food Security Multi-Donor Trust Fund TFOA0645, March 18, 2016.

<sup>21</sup> Source: APNIP PIU, final disbursements, as of June 2023. The actual costs changed due to the project restructuring in 2020.



WUAs and FWUAs, (c) off-farm irrigation infrastructure and water measurement structures, and (d) limited rehabilitation works on selected critical off-farm structures managed by the DWRLI.<sup>22</sup>

**12. Component 2: Agricultural Advisory Services** (estimated US\$3.5 million, actual at closing US\$5.19 million). This component was designed to provide agriculture advisory services to WUA members within selected local government areas (*Aiyi Aimaks* [AAs]) to increase irrigated agricultural production and improve access to markets, including (a) training and technical advisory support for participating WUAs on the rehabilitation of I&D systems and development of agricultural development plans (ADPs); (b) provision of small grants up to US\$30,000 to participating WUAs to implement ADPs; (c) advisory services for knowledge dissemination to a wider group of beneficiaries; and (d) on-farm water management demonstrations.

**13. Component 3: Nutrition Improvements** (estimated US\$4.6 million, actual at closing US\$3.7 million). This component was designed to support improved productivity, food security, and nutrition levels of beneficiaries, especially women, female adolescents, and children in selected AAs, and consisted of four subcomponents in support of a wide range of activities, as follows:

- (a) Improved household nutrition through nutrition education targeting women (18–49 years), children (0–5 years), and adolescent girls (12–17 years)
- (b) Provision of micronutrient and vitamin supplements for pregnant women, women of reproductive age and adolescent girls, and children of 6–24 months
- (c) Improved household nutrition and dietary consumption by improving domestic gardening and providing options for household plot improvement; identification of the most vulnerable households to receive nutrition assistance; establishment of women’s SHGs and community seed banks for provision of good quality vegetable seeds; carrying out of detailed technical assessments of current agronomic and production practices, seed and crop status, soil fertility and soil testing, advisory services for individual households, including development of household plot production guidelines and demonstration materials, and establishment of household demonstration plots; and associated season-long training and financing for basic equipment.
- (d) Improved national coordination for food and nutrition security through provision of support for the FSC.

**14. Component 4: Project Management** (estimated US\$1.9 million; actual at closing US\$2.85 million). This component financed project management costs, including for PIU staff, training, equipment, operational costs, administration, coordination, engineering, procurement, financial management (FM), safeguards, and M&E.

**SIGNIFICANT CHANGES DURING IMPLEMENTATION**

**Revised PDOs and Outcome Targets**

**15. The PDO remained unchanged during the project.** However, the PDO indicators were revised through formal project restructuring in March 2020, following the World Bank midterm review (MTR), to better align indicators to the PDO and improve definitions and methodologies to better capture progress and achievements. In addition, several modifications were made to the intermediate results indicators. The revised PDO indicators are shown in Table 1 and a detailed list of all changes including those for intermediate results indicators in Annex 7.

**Table 1. PDO Indicators at Appraisal and after restructuring**

Original PDO indicator	Base line	End Target	Revised as Part of March 2020 Restructuring	Base Line	End Target	Rationale for Revision
Average % increase in crop production	0	10	Average % increase in crop productivity	0	10	Crop production was changed to crop productivity to improve the definition and

<sup>22</sup> Under the Ministry of Agriculture and Land Improvement.



Original PDO indicator	Base line	End Target	Revised as Part of March 2020 Restructuring	Base Line	End Target	Rationale for Revision
for WUAs (with completed I&D and advisory services)			for WUAs (receiving full package of improved irrigation, seeds, fertilizers or other goods, and training)			attribution to the project-supported activities, as production includes not only yields but cropped areas (cropping patterns) and prices, going beyond the project scope. The WUA member definition was also refined to specify those receiving full project support (improved irrigation, seeds and fertilizers, agricultural machinery, and training).
Water users provided with new/improved I&D services		36,600	Water users provided with improved I&D services	0	26,000	Since the project worked only with operating WUAs, reference to new users was removed. The end target was lowered from all WUA members (36,600) to those WUA members expected to benefit (26,000).
Water users provided with I&D services – female	0	7,200	Water users provided with improved I&D services – female	0	2,600	The number of female water users was reduced from 7,200 to 2,600, as water users were defined as heads of households, and the number of female-headed households is relatively small.
Proportion of households with food consumption score (FCS) above 28.5 points	—	40 percent	Women 15–49 years of age who consumed at least 5 of 9 food groups	67.3 percent	75 percent	The indicator on household consumption was removed, as the baseline study showed that 98 percent of households already had a score of 35 points and thus the target had already been met. Instead, a new indicator related to proportion of women 15–49 years of age who consumed at least 5 of 9 food groups was introduced.

### Extension of the Closing Date

16. The project’s closing date was extended by one year from June 30, 2022, to June 30, 2023, in response to the recipient’s request, through a formal project restructuring processed in February 2022, primarily to allow completion of the I&D rehabilitation works that were subject to delays including those resulting from the coronavirus disease 2019 (COVID-19) pandemic.<sup>23</sup>

### Revised Components

17. **The project components were not changed during implementation.** Implementation arrangements also remained unchanged throughout the project duration.

18. **However, the March 2020 restructuring reallocated funds between the APNIP components and cancelled one of the subcomponents under Component 3.** These changes aimed to support the GoK’s efforts to mitigate emerging food security risks and ensure sustainability of agricultural production during the COVID-19 pandemic. Specifically, funding for Component 2 was increased by US\$2.27 million to provide seeds and fertilizers for the fall 2020 and spring 2021 planting seasons for 7,800 farmers in 30 participating WUAs. Subcomponent 3.2 (Provision of Micronutrient Supplements) was canceled as per the Recipient’s request due to a change in the GoK’s priorities and lack of progress

<sup>23</sup> World Bank APNIP Restructuring Paper, Report No: RES50016.



due to persistent difficulties in procuring iron folic acid and micronutrient supplements. Furthermore, project management costs (Component 4) were increased using cost savings from Components 1 and 2. The revised cost estimates are shown in Annex 3.

### Rationale for Changes and Their Implication on the Original Theory of Change

19. **The above-described changes did not affect any core elements of the Theory of Change, which remained relevant and valid throughout the project implementation.** At the same time, these changes (a) enabled the project to support the GoK's efforts to mitigate emerging food security risks and ensure sustainability of agricultural production during the COVID-19 pandemic; (b) allowed for modification of the PDO indicators to reflect the actual situation on the ground, based on the MTR findings and fine-tune formulation of indicators so they could be more readily measured and to ensure their attribution to the Project; and (c) enabled the recipient to take advantage of cost savings.

## OUTCOME

### A. RELEVANCE OF PDOs

#### Assessment of Relevance of PDOs and Rating

20. **Relevance of the PDO is rated High.** The APNIP was highly relevant at the appraisal and continued to be fully in line with the subsequent World Bank Country Partnership Frameworks (CPFs) and the Government's programs, as described in the following paragraphs.

21. **Alignment with the World Bank strategy. At project closing, the APNIP was fully aligned with the recently completed World Bank CPF for FY19–FY22<sup>24</sup> (Report No. 130399-KG) and the new CPF for FY24–FY28<sup>25</sup> (Report No. 182689-KG).** Under the new CPF, three high-level outcomes (HLOs) were identified to support the transition to a more stable, inclusive, and sustainable development path: Increased Private Sector-led Job Creation (HLO1); Improved Access to Sustainably Managed Natural Resources (HLO2); and Enhanced Human Capital and Empowerment of Vulnerable Populations (HLO3). HLO2 has a specific focus on energy, water, agriculture, and resilience to climate change, both to safeguard the livelihoods of rural populations and as a driver of economic growth. The APNIP focused on the water and agriculture sectors through further development of autonomous farmer led WUAs (HL01), improved access to water and increased efficiency of water use (HL02), training and advisory services for improving skills and knowledge of vulnerable rural populations (HL03), and improved nutrition and training to help improve food security (HL02 and HL03).

22. **Alignment with the Government program.** An important element of the National Development Strategy 2018–2040<sup>26</sup> is the development of energy- and water-efficient irrigation networks, with improvement of agricultural production considered a key for food and nutrition security. The Government has adopted the National Irrigation Program for 2017–2026,<sup>27</sup> which indicates that climate-resilient irrigation infrastructure should be modernized to (a) create new jobs, improve socioeconomic conditions, and reduce migration; (b) develop crop farming; and (c) increase tax revenues and GDP. The project is also aligned with the Food Security and Nutrition Program for 2019–2023,<sup>28</sup>

<sup>24</sup> Discussed by Board on November 8, 2018. The CPF for the original period FY19–FY22 was extended by one year (up to FY23).

<sup>25</sup> Discussed by Board on October 31, 2023.

<sup>26</sup> National Development Strategy 2018–2040, November 2018. See National\_Development\_Strategy\_of\_KR\_2018-2040\_final\_ENG.docx (live.com).

<sup>27</sup> State Program for the Development of Irrigation 2017–2026. See Order of the Government of the Kyrgyz Republic "About approval of the State program of development of irrigation of the Kyrgyz Republic for 2017-2026..." (cis-legislation.com).

<sup>28</sup> Food Security and Nutrition Program for 2019–2023. See Food Security and Nutrition Program in the Kyrgyz Republic for 2019-2023. | UNEP Law and Environment Assistance Platform.





which aims to achieve sustainable development, ensure the country's food security, and respond to internal and external threats for the stability of the domestic food market.

## B. ACHIEVEMENT OF PDOs (EFFICACY)

### Assessment of Achievement of Each Objective/Outcome

23. The PDO is to increase agricultural productivity and food and nutrition security of rural households in selected areas of the Recipient's territory. It can be unpacked into two outcomes, as follows:

- (a) To increase agricultural productivity of rural households in selected areas of the Recipient's territory.
- (b) To increase food and nutrition security of rural households in selected areas of the Recipient's territory.

24. Achievement of each of these two objectives, including meeting the targets of the corresponding PDO indicators, is discussed in the following paragraphs.

### Outcome 1. Increased agricultural productivity of rural households in selected areas of the Recipient's territory.

*Rating: Substantial*

25. To support increased agricultural productivity, the project financed a combination of activities including I&D rehabilitation, provision of good-quality seed and fertilizer, provision of agricultural machinery, training of WUA members in improved agricultural production technology, and on-farm demonstrations. Measures were also taken to strengthen the capacity of the WUA management to deliver irrigation services for their members. **Together, as indicated by the endline evaluation, the combination resulted in an average 65 percent productivity increase<sup>29</sup> for WUAs that received a full package of project inputs** (improved irrigation, seeds and fertilizers, agricultural machinery, and training), far exceeding the 10 percent target. While this figure appears high, the actual yields achieved are not exceptional and are well within the normal range, and in line with other projects,<sup>30</sup> and demonstrate the value of combining irrigation improvements with improved agricultural technologies and training. The various contributing factors to the productivity increases are assessed further in paragraphs 29-32.

26. The PIU also independently surveyed the 30 WUAs in 2022 to estimate productivity increases specifically for WUA members who received seeds of three crops (wheat, barley, and maize) and fertilizers as well as improved irrigation. **The weighted average yield increase was 44 percent higher than the 2016 National Statistical Committee (NSC) data for the project-supported districts (i.e., before the project) and 29 percent higher than the 2022 NSC data.** The NSC figures reflect the yields that would be expected without the project. A summary of the productivity increases is given in Table 2 below.

27. The Food and Agriculture Organization (FAO) Production Index<sup>31</sup> was used to assess whether weather and other changed conditions affected the results. **The Index indicated that 2022 was a good year but not much better than the baseline years of 2016 and 2018, and thus that the observed productivity increases resulted from the project interventions.** The high yield increase for maize reported in the endline study is not unreasonable, as only a relatively small amount was grown before improvement, and yields are well within the normal range. The relatively high yield increases for wheat and barley can be attributed to additional irrigations during the peak growing season coupled with use of high-quality certified seed and, in some cases, better land preparation and planting precision with new agricultural machinery. Fodder crops (particularly alfalfa) showed a high yield increase that can be attributed to

<sup>29</sup> Productivity is measured as average yield over 47 crops, weighted by planted area, not an arithmetical average.

<sup>30</sup> For example, under the ADB AADP, farmers trained through advisory services exceeded the average yields of all farmers across seven crops by an average of 62 percent.

<sup>31</sup> The FAO Production Index is based on average cereal yields, with 100 = 2004–2006, and gives an indication of conditions including weather and other changing conditions in that year.



greater frequency, amount, and timeliness of irrigation water applied, thus allowing an increased number of cuts during the season.

**Table 2. Average Weighted Yields (kg/ha)<sup>a/</sup> and Productivity Increases (%) for Major Field Crops**

Crop	Baseline 2018	End Line 2022	%	NSC 2016 <sup>c/</sup>	PIU 2022	%	NSC 2022 <sup>b/</sup>	PIU 2022	%
Wheat	2,043	2,975	45.7	2,100	3,029	44	2,404	3,029	26
Barley	1,739	2,951	69.7	1,994	3,065	54	2,115	3,065	45
Maize	2,979	7,666	157.3	5,889	7,966	35	6,784	7,966	17
Alfalfa	3,439	6,343	84.5	—	—	—	—	—	—
Sainfoin	5,230	6,666	27.5	—	—	—	—	—	—
Cotton	2,490	3,216	29.2	—	—	—	—	—	—
Beans	1,039	1,327	27.7	—	—	—	—	—	—
All crops			64.6	—	—	44	—	—	29
FAO Production Index	117	121	—	115	121	—	121	121	—

Note: a/ Yields are weighted averages by planted area; b/ The PIU data from 2022 were compared with NSC data from the pre-project year of 2016 and from the end year 2022, with the NSC data reflecting normal expected yields.

**28. Changes in crop composition.** The ICR mission observations and the end-line survey also indicated that **though the main field crops remained the same, there was a small shift to higher value crops (maize, berries, and vegetables) following irrigation improvements.** The area of alfalfa for livestock feeding and sale also increased. A further shift toward higher value crops is likely over time, as farmers take advantage of the opportunities afforded by improved irrigation. Increased production (yields and area grown) of fodder crops would also be expected to increase livestock production. The livestock production index has grown at an average of more than 1.5 percent per year since 2002, with a concomitant increase in milk yields. However, the endline evaluation did not assess livestock production and the general increases cannot be attributed to the project.

**29. Agricultural productivity was increased through I&D rehabilitation, which enabled water to be delivered more efficiently, with more timely irrigation scheduling to a larger number of farmers, including tailenders who had not previously received sufficient water.** The rehabilitation works were implemented in 31 WUAs (one more than the 30 target WUAs planned at the outset of the project due to the utilization of cost savings). Improved I&D services were provided to 34,767 WUA members (far exceeding the revised target value of 26,000 and substantially achieving the original target of 36,600) and covered 64,632 ha of agricultural land (7.7 percent higher than the target of 60,000 ha), an average of about 1.86 ha per farmer. The number of female water users reached 6,715, far exceeding the revised target of 2,600 and substantially achieving the original target of 7,200. According to the end line study, 80 percent of farmers received irrigation water in the required quantity and frequency, while 91 percent confirmed improved water supply. The time required to deliver water was reduced (1.5 times more farmers received water within one hour), and conflicts were reduced due to better scheduling (63 percent of farmers indicated that the schedule was not violated). The PIU estimated that the coefficient of water use increased from an average of 56 to 76 percent because of the improvements (that is, reduced water losses), thus allowing previously partially irrigated land to be fully irrigated and a greater number of irrigations to be applied). For the timely maintenance of I&D systems and long-term sustainability of the improved I&D infrastructure, 32 excavators were also purchased and provided to WUAs and FWUAs. While the effect of the irrigation improvements (timeliness, quantity and frequency of irrigation, and increased coverage) cannot be separated from the other contributing factors, WUA members were very positive about the benefits (see Annex 14), and it is likely that productivity increases from irrigation rehabilitation were at least the 10-20 percent noted in the OIP.

**30. Agricultural productivity was improved through the provision of good quality seeds and fertilizers and the purchase of more efficient farm machinery.** Following the ADP preparation, small grants of US\$30,000 (plus a WUA



contribution of 10 percent) were made available to the 30 target WUAs<sup>32</sup> to address their priorities and improve capacity and services. Some grant funds were used to purchase good-quality certified seeds and fertilizers, with an additional amount purchased and distributed to 20,663 farmers to address food security needs and to increase productivity after the March 2020 restructuring (further details are given in Annex 10). Use of good quality certified seed (as opposed to self-saved seed mostly used by farmers) would be expected to increase yields. To enable longer-term benefits to accrue and to widen the beneficiary numbers, each WUA established a revolving fund for seeds and fertilizers with beneficiary farmers repaying the value of the input after harvest to the WUA for future purchase and distribution of seeds and other inputs. Some small grant funds were also used to purchase farm equipment to contribute to increased productivity, including tractors and planting, cultivation, and harvesting machinery according to each WUA's priorities. Use of this equipment contributes to more timely field operations and leads to improved land preparation, more precise planting and thus improved seed germination, reduced losses from weeds, and fewer losses during harvesting, and thus contributes to increased productivity. Around 2,704 WUA members benefited from the use of agricultural machinery in 2022 covering 10,530 ha (see Annex 10). Further, project savings allowed the purchase and delivery of additional grain planters, mini-tractors, and attachments to the target WUAs before project closure. While it is difficult to separate the effects of improved irrigation from the agronomic improvements, under the Support to Community Seed Funds (CSF) Project,<sup>33</sup> average yields were 39 percent higher than what the CSF farmers achieved in the year before the project, 44 percent higher than non-CSF farmers achieved in the same year, and 25 percent higher than the National Statistical Committee (NSC) statistics. It is likely that similar results were obtained under the APNIP.

**31. Training and consultations for farmers on improved agricultural technologies also contributed to increased agricultural productivity.** Around 10 percent of each grant was used to contract local consultants to provide advisory services and training on agricultural technologies including land preparation, planting, soil fertility, pest, and disease control, harvesting and storage, and marketing, with 2,546 trainings conducted for 25,339 WUA members (73 percent of total members), of which 8,419 were women (33 percent). Overall, the end line survey estimated that 60 percent of WUA members participated in training and consultations, an impressive figure. The PIU surveyed 150 farmers/WUA members to assess the effectiveness and practical application of the information provided on improved agricultural technologies and field crop production. The survey indicated that 81 percent of farmers/WUA members applied the knowledge gained to increase the productivity of their crops.

**32. To contribute to increased productivity, on-farm demonstrations were established** at 65 sites, 30 with drip irrigation and 35 with improved water management (short-furrow and contour irrigation), plus use of water measurement devices on a range of orchard, vegetable, and field crops. Average water use in the demonstration plots was 33 percent lower (2,266 m<sup>3</sup> per ha less), yields 24 percent higher, and net profits 36 percent higher (KGS 53,000 per ha) than standard practices. Trainings at the sites were conducted for 7,621 farmers, of which 1,698 were women. While some technologies have been adopted, the ICR mission noted that the demonstrated drip irrigation systems had not been widely adopted, partly because of high costs (currently around US\$2,800–3,200). However, farmers had installed simpler and cheaper modified systems, especially on small plots and in the south.

**33.** Based on the above and given the observed increases in yields from the combination of irrigation and crop production improvements, more efficient irrigation and strengthened WUAs, and the large number of beneficiaries, the achievement of Outcome 1 is rated **Substantial**.

## **Outcome 2. Increased food and nutrition security of rural households in selected areas of the Recipient's territory**

<sup>32</sup> The 31st WUA did not receive a small grant, as the consultancy contract to help the WUAs prepare ADPs and determine priorities had been completed and there was insufficient time to carry out the program before project closing.

<sup>33</sup> Japan Social Development Fund-financed and World Bank-administered Support to Community Seed Funds (CSF) Project, P144338, January 2013–August 2018.



*Rating: Substantial*

**34. To support increased food and nutrition security, the project financed a combination of nutrition education, dissemination of information on nutrition and health issues, improved domestic gardening to produce a greater quantity of nutritious vegetables and increase household incomes, strengthening of VHCs, and improved national coordination for food and nutrition security.** These activities are discussed in paragraphs 35 to 38 and detailed in Annex 11. The irrigation improvements discussed under Outcome 1 that led to increased agricultural crop productivity, including staple foods, were also major contributors to food and nutrition security. The program was designed according to best practice evidence indicating that nutrition education is less effective without agriculture-related interventions, and conversely that nutrition security is less affected when increased household income and production of nutritious foods occur without increased knowledge of an adequate healthy diet.

**35. The project contributed to increased food and nutrition security by increasing dietary diversity.** The endline evaluation showed that an increase in dietary diversity and (production and) consumption of iron-rich and nutrient dense food resulted from the combination of increased agricultural productivity, nutrition training at the community level and through local health centers, and increased production in household plots. The proportion of women 15–49 years of age who consumed at least 5 out of 9 food groups increased from 67.3 percent at baseline to 78.0 percent at project completion (compared with a target of 75.0 percent). Further, the survey indicated that consumption of iron-rich foods increased from 94 to 97 percent and vitamin A-rich foods from 84 to 85 percent. Around 1.5 times more families with a woman as the main breadwinner confirmed that their nutrition had become more varied, and that participation in information events significantly motivated them to maintain a proper balanced and varied diet, including consumption of food rich in iron and vitamin A.

**36. Nutrition education and information dissemination resulted in improved household nutrition and health.** As a result of the education and dissemination program, prenatal care indicators improved. Women began to pay more attention to the health of mother and child and take iron tablets/syrups and iron-folic acid tablets for the required amount of time. Child-feeding practices also changed, with twice as many mothers breastfeeding a child up to 6 months of age. The percentage of those introducing complementary foods at six months of age also increased. Women's hygiene and sanitation rates improved, the practice of boiling water increased improved, and sanitary conditions were upgraded. Specifically, 17 percent more households began to boil water before use, and washing hands increased to 96 from 88 percent. To accomplish these results, the project trained 1,269 medical workers (93 percent women) in 60 AAs on infant and young child feeding (IYCF) and nutrition and anemia in WRA and adolescent girls, exceeding the target by 5.7 percent. On a wider scale, the training was incorporated in national-level training, and a large community-level campaign was carried out with multiple events. In the same 60 AAs, 130,255 households were trained on topics such as the importance of a varied diet, anemia prevention, IYCF practices, food safety, and sanitation and hygiene with the help of 4,500 volunteers. The project also provided training for 225 VHCs and in villages where no VHCs existed, training was provided to local initiative groups, which were then converted to VHCs. This activity increased the number of volunteers providing outreach on nutrition and other health topics. A local nongovernmental organization, Kyrgyz Aiyldik Den-sooluk Committee (KADK), was hired to work with 60 local self-governments (*Aiyyl Okmotu* [AO]) to hold annual events to disseminate information on nutrition and health issues, with almost all AOs allocating funds (ranging from KGS 5,000 to 1 million) from their budgets. Under this activity, an information campaign 'Responsible Parenthood' was held with local communities, involving 10,230 people (6,150 women). In the context of World Clean Hands Day, information events were held for AOs and village activists in secondary schools, kindergartens, AO venues, and village clubs in 60 AAs, with 7,451 participants (2,830 women and 4,072 children). Seminars with heads of secondary schools in seven regions were held to further disseminate nutrition information to adolescent girls, covering 237 people (183 women). Information meetings on these topics were added to the program events organized by schools with parents and groups of students.



37. **Food and nutrition security was enhanced through improved domestic gardening.** To improve food quality and quantity from household plots, 1,340 SHGs were established from 2018 to 2021 in 246 villages, covering 11,100 people (including 89.5 percent women). Each group received good-quality certified seeds of a range of vegetable or fodder crops plus a season-long training program in production, storage, and processing. The average increase in yields for SHG members was 27 percent for vegetables and 31 percent for fodder crops compared with farmer's practice. The production increases resulted in an increase in sales income averaging about KGS 10,480 in each year for SHG participants and an increase in household consumption of vegetables. To enhance benefits, small equipment, including plastic tunnels, plexiglass greenhouses, drip irrigation, drying ovens, walk-behind tractors (moto-blocks), and other small equipment were then provided to all well-functioning SHGs. The ICR mission observations indicated that these items were highly valued and put to good use. The training program was also highly valued, with 83 percent of SHG members implementing their knowledge of nutrition and processing compared to a baseline of 35 percent. SHGs visited by the ICR team were continuing to operate and were functioning well, including in group use of shared equipment (such as greenhouses and drying ovens), continuing to meet regularly, sharing information, and collecting funds for activities including purchase of new seeds. Most SHGs maintained the same membership, but others had increased in number. In some cases, SHGs expanded their menu of nutritious crops to include fruits, berries, and other vegetables.

38. The observed increases in production of nutritious vegetables and increased incomes of vulnerable women resulting from the SHG program provided an opportunity for WRA and entire households to afford and consume more diversified (that is, more types of food groups) and healthy (such as iron-rich) food. This benefit was further enhanced and prompted through better understanding and knowledge of the importance of appropriate household nutrition gained by the many people effectively trained under the project. Accordingly, the achievement of Outcome 2 is rated **Substantial**. Project-supported activities leading to increased agricultural productivity also contributed to food and nutrition security through increased production of staple crops and changing composition of crops.

#### Justification of Overall Efficacy Rating

39. **The overall efficacy rating is Substantial.** The project substantially contributed to both Objective 1 on increased agricultural productivity and Objective 2 on increased food and nutrition security, as noted and discussed earlier.

#### C. EFFICIENCY

##### Assessment of Efficiency and Rating

40. **At appraisal, the analysis estimated an Economic Rate of Return (ERR) of 26.3 percent and an Economic Net Present Value (ENPV) of US\$48.2 million.** The ex-post economic analysis estimated a slightly higher ERR of 28.7 percent and an ENPV of US\$59.3 million, which demonstrates the economic viability of the project.

41. **Sensitivity analysis.** Economic returns were tested against changes in benefits and costs and for various lags in the realization of benefits. In relative terms, the ERR was equally sensitive to changes in costs and benefits. In absolute terms, these changes did not significantly affect the ERR, as was also noted at appraisal, and the economic viability was not threatened by both a 20 percent decline in benefits and by a 20 percent increase in costs, as the ERR in both cases remained well above the discount rate. A two-year delay in project benefits reduced the ERR to 21.7 percent. The detailed economic analysis is provided in Annex 4.

42. **Conclusions.** The ex-post (ICR) ERR and ENPV were higher than the ex-ante (design and MTR) analyses for several reasons: (a) the actual yield increase in the 'with project' scenario compared to the 'without project' scenario was much higher than the conservatively estimated 10 percent and 5 percent increases at the project design and MTR stages; (b) the social (economic) discount rate was revised to 6 percent, which resulted in an increased ENPV; and (c) the actual physical achievements (hectares in the command area) were higher than estimated. These points validate the project's high economic efficiency.



43. **Implementation efficiency.** The core project design elements were retained throughout implementation, while there was the need to modify some activities under the components as described above. Although declaration of effectiveness was delayed for about 10 months and implementation was slow at the project outset, these challenges were successfully overcome and the project was generally implemented on time, with only a one-year extension of the closing date required to cope with the impact of the COVID-19 pandemic. The client and PIU, with the support of the World Bank team, completed all project activities by the extended closing date and disbursed 100 percent of the allocated funds. The project was also able to finance I&D rehabilitation for 31 WUAs (one more than the planned target 30 WUAs), while the ADPs and small grants were provided for the original target 30 WUAs. Further, the project provided a greater quantity of seeds and fertilizers and farm machinery to the WUAs than planned and established a larger number of SHGs than foreseen. Project management costs increased only slightly from the originally planned 4.74 percent of the total project cost to 6.7 percent (see Annex 3), enabling the PIU to be sustained and to manage the project over the extended implementation period.

44. **Rating: The overall efficiency is rated Substantial based on the good economic return (ERR and ENPV) and satisfactory implementation/operational efficiency,** including 100 percent disbursement, a relatively low proportion of management costs, and ability to accomplish more activities than initially planned, although project effectiveness was delayed and a one-year extension was required to compensate for this initial delay, but mostly to cope with the impact of COVID-10 pandemic.

**JUSTIFICATION OF OVERALL OUTCOME RATING**

45. Based on the High rating of the Relevance of Objectives, the Substantial achievement of the PDOs, and the High efficiency rating, the overall outcome of the project is rated **Satisfactory**.

46. As some PDO indicators were modified during the March 2020 restructuring to be better aligned with the actual situation on the ground and to be more readily measurable, and because some target values were decreased (see paragraph 15 above for details), a split rating was applied. As the actual final values at project closure indicate that the project not only achieved and exceeded the revised targets but also substantially met the original target (see Annex 1), the overall outcome rating is retained as **Satisfactory**, as indicated in Table 3.

**Table 3. Summary of Outcome Rating**

Rating Dimension	Pre-Restructuring	Post-Restructuring
<b>Relevance of PDOs</b>	High	
<b>Efficacy</b>		
Outcome 1: Increased agricultural productivity of rural households in selected areas of the Recipient’s territory	Substantial	Substantial
Outcome 2: Increased food and nutrition security of rural households in selected areas of the Recipient’s territory	Substantial	Substantial
<b>Overall Efficacy Rating</b>	Substantial	Substantial
<b>Efficiency</b>	Substantial	
<b>Outcome Rating</b>	Substantial	Substantial
<b>Outcome Rating Value</b>	4	4
<b>Disbursement (US\$, millions)</b>	18.59	19.41
% Disbursements	49%	51%
Weight Value	4 × 49% = 1.96	4 × 51% = 2.04
Total Weights	4	
<b>Total Outcome Rating</b>	<b>Satisfactory</b>	

Note: Disbursement figures at project completion as reported by the Project Implementation Unit in June 2023.



## E. OTHER OUTCOMES AND IMPACTS (IF ANY)

### Gender

47. The endline survey found that only 8.8 percent of project-supported farms were de jure women-headed. However, the number of de facto women beneficiaries was greater, as many men, who are nominally declared as heads of households, are absent for reasons including work outside the Kyrgyz Republic. Many women benefitted through I&D rehabilitation partly because of improved water delivery to the participating/benefiting households, including in some cases to household plots that are normally managed by women. From the women surveyed, 20.6 percent confirmed their personal participation in Component 1 activities, while 79.2 percent believed that the availability of irrigation water had improved and 88.5 percent considered that irrigation in general had improved, a similar proportion as all farmers. In addition, the project specifically emphasized female participation through the nutrition and SHG program, in which 89.5 percent of the beneficiaries were women, mostly vulnerable. As reported in the implementation support missions, the SHG program enabled greater vegetable consumption by the household and other family members; helped preservation for winter and early spring; improved nutrient intake; and allowed the sale of surplus vegetables (which resulted in an increase in sales income averaging about KGS 10,480 in each year for SHG participants) with proceeds used for children's clothes, school supplies and, in some cases, valuable household goods such as vacuum cleaners and refrigerators that can improve hygiene and food safety.

### Poverty Reduction and Shared Prosperity

48. While the I&D rehabilitation was targeted to all members of the WUAs participating in the project, those farmers at the tail end who receive less water and more uncertain supply and, thus, represent the poorer households in the irrigation area, benefitted relatively more than those at the head. Further, the project effectively targeted the most vulnerable—that is, the most food-insecure individuals and households—to reduce poverty in the project area through the nutrition and SHG programs.

### Employment Opportunities

49. The main quantifiable increase in employment opportunities was the number of workers employed by the construction companies during the project financed I&D rehabilitation, amounting to 1,032 people as reported by the PIU.

### Institutional Strengthening

50. **The project specifically aimed to strengthen WUA capacity through training, preparation of ADPs, and provision of small grants (Component 2).** Training and consultations were provided for the administration and members of 30 target WUAs and 30 adjacent WUAs in ADP preparation, procurement and contract management, FM, operation of agricultural machinery, establishment of a revolving fund, and a range of agro-technical topics. In total, 319 trainings were conducted for 5,713 WUA members, including 1,168 women (20 percent). This strengthening resulted in increased capacity of the WUAs to provide services and deliver water efficiently.

51. **The project also aimed to improve national coordination for food and nutrition security.** Several activities were implemented to strengthen the capacity of the GoK bodies and other stakeholders to ensure the institutional sustainability of food security and nutrition programs. The APNIP contracted consultants to form an Expert Group (EG) to support the FSC headed by the Ministry of Agriculture. The EG effectively met the substantial capacity gap in food security and nutrition (FSN) policy planning and development, advocated for FSN issues across various platforms, was instrumental in revising and developing the new FSN program for 2019–2023, and disseminated knowledge and information on FSN. Project funding for the EG ended on December 31, 2019, after about two years. So far, the GoK could not find budget resources to continue the EG as planned, although other development partners such as the United Nations Children's Fund (UNICEF) and FAO continued to build the FSC capacity through their regular programs.



### Mobilizing Private Sector Financing

52. A major project focus was to increase private financing of future I&D infrastructure improvements and operation and maintenance (O&M) by the autonomous farmer led WUAs and WUA members. This was accomplished through both the I&D rehabilitation and training in improved WUA management and administration. The ICR mission noted that all WUAs visited had been able to raise irrigation fees (usually at least double) and increase the percentage of farmers paying through more reliable and timely delivery of water. As previously noted, 80 percent of end line survey respondents indicated that the financial stability of WUAs had improved and 51 percent that the collection of fees had improved (a number likely to increase since several WUAs had not yet completed the rehabilitation at the time of the survey in 2022).

### Improved Financial Stability of Participating WUAs

53. Overall, 80 percent of end line survey respondents indicated that financial stability of WUAs had improved, 51 percent that the collection of fees had improved (a number likely to increase, as several WUAs had not yet completed the rehabilitation at the time of the survey in 2022), and 87 percent that the WUAs had systematic meetings to resolve issues. The revolving funds established by the WUAs for seeds and fertilizers and the use of agricultural machinery also contributed to the WUAs' financial stability. About KGS 2.7 million was available from machinery services for WUAs' use and depreciation, and KGS 96.6 million was in the bank and KGS 162.4 million credited to farmers from seeds and fertilizers at the time of the ICR mission (see Annex 10).

### Other Unintended Outcomes and Impacts

54. **Climate change.** Although not part of the project design, the APNIP helped strengthen the capacity of the WUAs and WUA members to respond to climate change challenges. More efficient irrigation; demonstrations of drip irrigation; introduction of good quality seeds; more efficient farm machinery for better land preparation; and farmer and SHG training which included climate-smart agriculture techniques such as efficient land preparation and soil fertility management, integrated pest management, more timely harvesting, and improved storage contributed to improving farmers' capacity to adapt to climate change over the longer term.

## III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

### A. KEY FACTORS DURING PREPARATION

55. **The APNIP development objectives were well-selected and highly relevant to address agricultural productivity, food insecurity, and nutrition issues.** The objectives were aligned with the Government's development and poverty reduction strategies and programs and in line with GAFSP priorities to improve agricultural productivity, increase incomes, and ensure food and nutrition security and the World Bank's CPS 2014–2017.

56. **The APNIP was built on the experience of previous and ongoing World Bank operations and their support to the country in irrigation, agriculture, and nutrition.** The project design was logical and well-structured, and the components had well-aligned structures and clearly described the activities required to achieve the desired outcomes. The selection of the participating WUAs was based on the sound criteria used in previous World Bank-funded projects<sup>34</sup> including level of WUA development, condition of infrastructure, budget and fee collection, maintenance level, and area under irrigation. The procedures for I&D rehabilitation design and construction supervision developed under the previous projects were adopted for the APNIP needs. The agricultural advisory services component was to be carried out in synergy with the I&D irrigation infrastructure improvement and built on the existing independent agricultural advisory services developed under previous World Bank projects. The nutrition

<sup>34</sup> OIP-1, OIP-2, and additional financing for OIP-2.





component was somewhat separate from irrigation and agriculture but was intended to widen project benefits to include women and vulnerable households. The SHG program was built on the successful experience of supporting domestic gardening under previous World Bank projects and was linked to nutrition training activities. The components were equitably located in AAs selected in all regions to limit possible internal and ethnic difficulties following the 2010 events. The PIU had experience in implementing World Bank irrigation projects but lacked experience in agricultural advisory services or nutrition.

## KEY FACTORS DURING IMPLEMENTATION

### Factors Subject to the Control of Government and/or Implementing Entities

**57. Initial delays at the early stage of the project.** The project became effective in September 2016, about 10 months after approval, due to delays related to government approval, signing, and parliamentary ratification. Such delays are not uncommon in the Kyrgyz Republic and were not specific to APNIP. However, despite preparatory work done by the PIU and the World Bank in anticipation of the project launch, the PIU did not fill all the needed positions with competent staff in a timely way due to difficulties in agreeing on candidates, resulting in implementation delays at the project's outset. The PIU responsibility for managing several interlinked irrigation projects together did not prove workable but reorganization and contracting staff responsible only for the APNIP,<sup>35</sup> along with strong commitment and leadership during the second half of the project implementation period and sustained until the project closing, led to successful completion of all project activities and 100 percent disbursement. This enabled the project to be completed with only a one-year extension of the closing date, which compensated for the initial delay with declaring project effectiveness and COVID-19-related delays. Ultimately, the project outcome was not severely affected due to strong commitment and proactive efforts at the later stages of implementation by the PIU and World Bank.

**58. Issues related to launching and implementation pace of irrigation rehabilitation works.** Despite an initial list of potential WUAs based on the well-defined criteria used in previous World Bank operations in the irrigation sector, the process was fraught with delays during implementation to the extent that Component 1 was rated Moderately Unsatisfactory at one point. Delays resulted from the long decision-making process in finalizing the list; need to re-tender contracts; poor performance of some contractors; rising prices and limited availability of construction materials (such as prefabricated concrete forms); difficulty in carrying out works during the irrigation season; and impacts of COVID-19, including difficulties in finding the required manpower. Nevertheless, implementation improved from 2020 after appointment of dedicated APNIP irrigation staff; strengthened contractor supervision; preparation of detailed implementation schedules; and institution of regular monthly meetings with contractors, WUAs, and the World Bank.

**59. ADPs and small grants were slow to start.** Despite substantial support at an early stage for developing an ADP implementation manual, progress was initially slow. Seven months after effectiveness, the project still did not have the key project staff including the component coordinator for agriculture. Nevertheless, with the support of two consultancy companies (one for north and one for south), each of the 30 WUAs prepared adequate ADPs and submitted proposals for use of the small grants. The ADPs' implementation was also sometimes slow, partly because the WUAs' capacity to prepare technical specifications and procure goods and services was overestimated during project preparation. There were also some conflicts between the PIU and consultants and the PIU's reluctance to provide procurement support and monitoring. This improved in the second half of the project implementation period when the PIU contracted local specialists to support the WUAs with ADPs' implementation, and, as a result, all the ADPs were finally completed on schedule.

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<sup>35</sup> Including regional engineering coordinators, environmental safeguards specialists, additional procurement specialists, and coordinators for agriculture and nutrition, which held up progress on implementation.



60. **Nutrition activities were also slow to start**, due to the absence of a nutrition coordinator until at least seven months after project effectiveness. This delay slowed the contracting of the EG to support the FSC Secretariat. Similarly, the absence of the agriculture coordinator responsible for the SHG program delayed the progress of this subcomponent. Subsequently, these activities picked up considerably once suitable staff were appointed.

#### Factors Subject to World Bank Control

61. **The World Bank supervision was adequate throughout project implementation**, with proactive support and appropriate follow-up after each mission, helped by low turnover of task team leaders, including a rapid response to requests for restructuring and training and support for the PIU provided by procurement, FM, and safeguards teams. Considerable assistance was provided to the PIU M&E staff during the MTR to clarify and modify indicators as appropriate. To help expedite the I&D rehabilitation works and address problems, monthly meetings were instituted between the PIU and World Bank after the MTR. In most cases, the World Bank team responded and provided reviews of documents prepared by the PIU in a timely way, including civil works contracts, terms of references, the ADP implementation manual, and baseline and endline evaluations.

#### Factors outside the Control of Government and/or Implementing Entities

62. **COVID-19**. The COVID epidemic affected implementation in 2021 and 2022 in various ways: limiting monitoring and supervision by PIU, restricting training activities, and making it more difficult to complete irrigation works due to manpower availability. The World Bank implementation support missions also had to be conducted virtually. As a result, the project was extended for one year from June 2022 to June 2023 to allow for the completion of all activities.

### IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

#### A. QUALITY OF MONITORING AND EVALUATION (M&E)

##### M&E Design

63. The M&E design was satisfactory and the PDO was relevant and well-formulated. The Results Framework was well-designed with adequate PDO and intermediate indicators although the FCS proved not to be an appropriate indicator of nutrition benefits, as the estimated target value was found to be fully met at the time of baseline survey. Consequently, this indicator was dropped and replaced by another PDO indicator at the MTR (see paragraph 15). Several other intermediate indicators also had to be clarified and the measuring methodology agreed with the PIU during the MTR (see Annex 7). The M&E system was well-designed to include independent baseline, midterm, and end line surveys to assess the PDO and intermediate indicators and evaluate the project's contribution to agricultural productivity and food and nutrition security, but it relied on limited in-country capacity to conduct these surveys.

##### M&E Implementation

64. During the early project stages, M&E implementation was delayed because there were no M&E specialists specifically working on the APNIP until seven months after project effectiveness. Subsequently, after an M&E specialist was on board, project progress reports and Results Framework updates were generally timely and made available for the implementation support missions. Following the 2020 MTR, the project was properly restructured to clarify the formulation of some indicators and make them more measurable (see paragraph 15 and Annex 7). The baseline survey assessment of the PDO and intermediate indicators was not completed until June 2019 due to delays in contracting a suitable local company and finalizing the report, so the midterm assessment was cancelled given the limited time before the MTR (March 2020). Due to the observed limitations in reporting, the M&E rating was lowered to 'Moderately Unsatisfactory' from June 2021 to January 2022. Subsequently, due to improved PIU M&E staff performance, the M&E reporting improved, and the project closed with a Satisfactory M&E rating. Following the onset of the COVID-19 epidemic, an adequate endline survey was eventually carried out in 2022 and finalized by



project completion in 2023. It is also noted that the PIU carried out useful additional surveys toward the end of the project to assess yields obtained by farmers receiving seeds and fertilizers as shown in table 3, use of revolving funds, and adoption of technologies, while the contracted consultants provided detailed assessments of the results of the ADP preparation, demonstration program, and SHG activities.

### M&E Utilization

65. The M&E results were used to inform the project management, although sometimes decision-making appeared to be guided more by technical engineering aspects than other considerations. Nevertheless, the M&E data proved useful in adjusting the target indicator values at MTR and ensuring their measurability and attribution to the project activities. By project completion, a considerable database was prepared, especially on irrigation rehabilitation, WUA performance, and crop productivity, which proved useful for project management and would be available through the WRS for use to inform and support future project implementation.

### Justification of Overall Rating of Quality of M&E

66. Despite some observed shortcomings, as noted above, the quality of M&E improved over time and generated a useful database. Consequently, the overall rating of M&E quality is assessed as **Substantial**.

### ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

67. **Environmental safeguards.** The project was classified as Category 'B' for the purposes of OP 4.01 because it was not expected to involve any large-scale, significant, or irreversible adverse environmental impacts. Appropriate preventive and/or mitigation measures were duly identified in the Environmental Management Plan (EMP), which set out the modalities for site-specific environmental screening and EMP preparation for the existing irrigation schemes. Despite some delays at the outset due to the absence of a PIU environmental safeguards specialist, satisfactory EMPs were ultimately prepared for all 31 WUAs benefiting from I&D rehabilitation during the project, and WUA staff were trained on compliance with EMP requirements and environmental sustainability of commissioned works. In December 2022, monitoring was carried out in line with the World Bank recommendations, to ensure that the constructed structures operated according to environmental safety requirements. This included verifying that there was no waterlogging around canals, canals were not littered, and the sides of canals were not destroyed. Mud flow analysis was also carried out. Overall, the APNIP was implemented in compliance with the World Bank environmental safeguards policies as well as national environmental requirements and was rated Satisfactory on compliance with environmental safeguards throughout implementation.

68. **Social safeguards.** Involuntary Resettlement - OP 4.12 was triggered for site-specific works requiring small-scale land acquisition. A Resettlement Action Plan was required and conducted for only one off-farm site before project appraisal. A Resettlement Policy Framework was also prepared before project appraisal to provide the overall framework for handling any issues during project implementation. The PIU hired a social safeguards specialist with responsibility for ensuring effective implementation of social safeguards measures in line with the national policies on land acquisition and resettlement and provisions of World Bank OP 4.12. All 31 WUAs were regularly monitored with no impact on private lands noted in 29 WUAs, for the other two WUAs, easement agreements were signed with the affected people (22 in total) and the irrigation improvements then proceeded. The project closed with a Satisfactory social safeguards rating.

69. **Grievance Redress Mechanism (GRM).** A GRM was established at an early stage to address involuntary resettlement issues and any issues related to project-funded activities. The PIU social safeguard specialist was responsible for overseeing implementation of the GRM and maintained a register of grievances received and responses to them. Since the beginning of the project, 57 grievance cases were registered—10 complaints and 47 appeals. All grievances were resolved satisfactorily by the project completion date.



70. **Other safeguards.** Other safeguard policies triggered were (a) Pest Management - OP 4.09, (b) Safety of Dams - OP/BP 4.37, and (c) Projects on International Waterways - OP/BP 7.50. For pest management, appropriate training of agricultural advisers and WUA staff in integrated pest management (IPM) was carried out by qualified and experienced IPM trainers. Some small dams (less than 15 m in height) were present, and in line with OP/BP 4.37, appropriate actions were taken to ensure dam safety, including more detailed inspections and safety measures. With respect to OP/BP 7.50, the project financed only minor rehabilitation and alterations of existing irrigation systems, some relying on water from the Naryn, Talas, and Chui rivers shared with Kazakhstan, Tajikistan, and Uzbekistan. As the APNIP did not finance enlargement or development of new irrigation systems, the project fell under the exception to the riparian notification requirement in paragraph 7(a) of OP 7.50, as approved by the Vice President for the Europe and Central Asia Region on June 11, 2015.

71. **FM was Satisfactory or Moderately Satisfactory throughout implementation.** The budgeting capacity was sufficient, and the financial reports were a useful planning tool for the PIU. The quarterly financial reports and annual audits carried out by private auditors were issued on time and were satisfactory to the World Bank. One challenge in December 2020 was that the guaranteeing bank refused to repay the advance payment of KGS 5.5 million under a terminated contract due to the absence of a written refusal from the contractor. The PIU resolved the issue by establishing a payment schedule with the contractor such that the whole amount was recovered by July 2021. The FM rating was generally Satisfactory, while the closing FM was rated Moderately Satisfactory in the latest World Bank Implementation Status Report due to internal control issues involving unjustified payments to a contractor and manipulation of accounting records discovered during the FM review in December 2022. However, these deficiencies were fully addressed by project closing, including a change of the financial manager and full recovery of funds. The annual audits did not note these deficiencies as audits are sample based and do not pick up all issues. Accordingly, it is recommended that the World Bank ensures through the Terms of Reference, considering the elevated risks associated with construction contracts, that auditors undertake comprehensive audit examinations and substantive procedures for such contracts.

72. **Procurement** under the project generally complied with the provisions of the Financing Agreement. At the same time, the procurement rating did not enjoy fully satisfactory status during the project life, especially at the APNIP outset when weak PIU staff capacity resulted in delays in conducting procurement. In 2017, the rating was downgraded to 'Moderately Unsatisfactory' because of slow progress in the procurement of civil works and the two complaints that were received regarding the first contract award under Component 1. Subsequently, the PIU's procurement performance improved in the second half of project implementation by replacing staff and hiring additional specialists, with regular monitoring and capacity building provided by the World Bank procurement staff. Minor shortcomings remained concerning contract management, advertisement and disclosure arrangements, bidding processes, and incomplete information uploaded in the Systematic Tracking of Exchanges in Procurement (STEP) tool. Consequently, the project closed with a Moderately Satisfactory procurement rating.

## BANK PERFORMANCE

### Quality at Entry

73. The project design was well aligned with relevant government and World Bank strategies and reflected the strategic country context and sector challenges at the time of appraisal. The project built on successful interventions and learned lessons from previous projects, notably the OIP and National Water Resources Management Project,<sup>36</sup> ASSP and AISP that developed advisory services, and the APAP for development of SHGs. The institutional framework working with operational WUAs and the DWLRI (later becoming the Water Resources Service) was appropriate. Risks

<sup>36</sup> National Water Resource Management Project, P144336, approved April 2014, ongoing.



were generally adequately identified and mitigated, although the PIU capacity to carry out multiple projects was overestimated. The World Bank team involved several international experts in the design and early stages of the project, including irrigation engineering, preparation of an implementation manual for ADPs, and nutrition specialists. Adequate FM and procurement risk assessments were also prepared before project appraisal.

### Quality of Supervision

74. The World Bank team provided regular implementation support with 14 missions carried out including an MTR, virtual missions during COVID-19, monthly meetings that started after the MTR on irrigation rehabilitation progress, and additional technical missions on the agriculture and nutrition components. Support was strengthened by international consultants on technical and institutional aspects who joined the missions and carried out technical visits to provide advice to both the team and the PIU. The project certainly benefited from the fact that the co-task team leader (and subsequently, the task team leader) started during the early implementation phase and was continuously based in the country, which provided the opportunity to quickly respond to arising challenges. Strong continuity of the World Bank experts was also provided throughout the project for the irrigation and agriculture components including the SHG activity as well as safeguards and procurement. There was less continuity for other nutrition activities in the first half of the project, although an international consultant provided valuable support; however, from the MTR, a dedicated World Bank staff member provided valuable support for successful completion of the nutrition component. The team was both proactive and supportive of the Government's requests to restructure the project based on findings of an MTR in 2020 and continued to provide support through virtual missions in response to the COVID-19 epidemic.

### Justification of Overall Rating of Bank Performance

75. The World Bank's performance is rated **Satisfactory** given the substantial quality at entry and well-thought project design, close supervision, proactivity in project restructurings, and efforts to include appropriate international expertise during the project.

### D. RISK TO DEVELOPMENT OUTCOME

76. **Institutional development.** The project WUAs were considerably strengthened from a weak base both at the technical level through irrigation rehabilitation and at the management and administrative levels through training, and were provided with assets that increased income for investment and O&M. The fee collection rate increased, and the revolving funds provided additional income. The project emphasized the value of autonomous farmer led WUAs, which has been supported by the World Bank since 1997 and is codified in the 2002 Law on WUAs. However, there is a risk that the role of the autonomous WUAs could be weakened in the future with uncertainty over the roles of local government (AO), district-level water authorities (*RayonVodKhoz*), and the WSUs under the national WRS. Further efforts from the World Bank and WRS are required to define the roles and strengthen the water institutions in their roles and responsibilities to achieve long-term technical and financial stability.

77. **Financial sustainability.** The Ministry of Finance required repayment to the budget of 25 percent of the costs of rehabilitation and 50 percent of the costs of the excavators provided as a part of Component 1. Most repayments are now due, with a concomitant large increase in WUA costs. The project mitigated this risk through enabling the WUAs to improve delivery of water and provide additional services (agricultural machinery and good-quality seeds and fertilizers), and thus to increase the irrigation fee level and collection rate from WUA members. Nevertheless, many WUAs were concerned that the WUA membership fees will not suffice to fully cover the repayment requirements and may reduce their opportunity to continue investment in improving the I&D system including expanding the works to cover all the command area. It will be necessary for the WSUs/WRD to continue to monitor and propose solutions for continuing investment.



78. **Infrastructure rehabilitation and O&M.** All I&D infrastructure rehabilitation was successfully completed, and the infrastructure is currently being satisfactorily operated and maintained by the WUAs. The rehabilitated assets are expected to last 25 years. There is a risk that inadequate and non-timely O&M will reduce the lifespan of the works, although the risk has been mitigated by the project's WUA capacity strengthening. In addition, the provision of excavators limits the modest risk that some on-farm irrigation channels could silt up again in the long term.

79. **Climate Change.** Reduced availability of water for irrigation was a problem in 2102 and 2023, although 2022 was a good year. This is a recurrent problem (typically every 5 or 6 years) but may be exacerbated by climate change. The project aimed to mitigate effects through better conveyancing, measurement, and delivery of water. The coefficient of water use increased from 56 to 76 percent because of the project, that is, reduced conveyancing losses from 44 to 24 percent.

80. **Agricultural Development Plans.** The ADPs proved to be a useful tool for the WUAs to analyze their operations and to determine their priorities, particularly helping to determine the use of the funds allocated through the small grants program. There is a risk that the agricultural machinery purchased through the small grants will not be replaced or added to, and that the value of the revolving funds that were set up for repayments of the value of the seeds and fertilizers provided will wind down over time. These risks were mitigated by the preparation of guidelines at the outset of the project governing the operation of machinery including allocating a proportion of funds for depreciation and for the operation of revolving funds for seed and fertilizer. The actual terms for repayment into the revolving fund and the level of charges for machinery use are determined by the WUA management and approved by the WUA General Assembly of members, thus it is in the interest of members to sustain these programs. Further, the use of good quality seeds and fertilizer has a demonstration value and should generate increased income for farmers allowing further purchases of these inputs. Nevertheless, it will be necessary for the WSUs/WRD to continue supporting the WUAs through monitoring the WUA budgets and expenditures and providing advice and training on maintenance of the machinery and revolving funds.

81. **Training.** The well-designed training activities for the WUAs, farmers, SHGs, and village women proved beneficial, with evidence suggesting that many beneficiaries substantially increased their knowledge and skills. However, even though the training material is available online and as hard copies, the benefits will wane over time as WUA management and people move on. Training should not be considered a 'one-off' activity but should be continued to involve new people over the long term. The nutrition training and formation of SHGs were beneficial, but as above, there is a risk that additional training will be needed over time. This risk can be mitigated by including ongoing training as part of future projects, especially grant projects such as those funded by GAFSP.

82. **Sustainability of nutrition activities.** There is a risk that some of the nutrition activities will not be continued after the project closes. The risk has been mitigated by agreements with local governments (AOs) to allocate funds from their budget for continuing nutrition and health programs, incorporation of project-related nutrition training modules into national-level training programs, and establishment of additional VHCs.

## V. LESSONS AND RECOMMENDATIONS

83. **The comprehensive cross-sectoral approach (supported by GAFSP financing) comprising irrigation, agriculture, and nutrition provided synergistic benefits in terms of agricultural productivity and food and nutrition security.** The project demonstrated the value of implementing project activities aimed at all households in the same geographical areas, that is, in the selected WUAs, the same AAs and same villages. It is recommended that similar approaches are considered in future projects that aim to improve livelihoods of rural households.

84. **Irrigation rehabilitation interventions should be clearly linked to on-farm agricultural support.** Farmers were able to obtain high-quality seeds and, in conjunction with improved irrigation water supply, training, and agricultural



machinery, they increased productivity and started to change their cropping pattern and shift to higher-value crops. Accordingly, it is recommended that future irrigation projects should include a project component to provide on-farm support to farmers with the aim of increasing agricultural production and thus food security. It is noted that there are 481 WUAs in the country, with only 31 covered by the project, leaving considerable scope for future activities.

**85. The value of strengthening the WUA management capacity in irrigation projects was clearly demonstrated.** Capacity was often low at the project outset, but was strengthened substantially through irrigation rehabilitation, training in administration and management, and provision of agricultural machinery and farm inputs that enabled the WUAs to provide additional services to their members. It is recommended that comprehensive training and other support should be provided for WUAs in future projects but also that the WRS and WSUs develop and provide WUA refresher training programs in the longer term.

**86. The SHG methodology was a good approach to introduce quality seed and increase productivity on household plots and improving nutrition for vulnerable households, especially for women.** Good social mobilization and season-long training were an essential part of this methodology. Similar programs will be valuable in the future to ensure that projects represent all household members and women-headed households.

**87. The nutrition training program proved to be beneficial for large numbers of women and vulnerable households, particularly when coupled with increased farm and household plot productivity.** For further sustainability, the following are recommended: (a) include educational programs on IYCF and nutrition and anemia in WRA and adolescent girls in the program of the Kyrgyz National Institute for Training of Medical Workers (KSMIRAT) for continuous professional development of medical workers at the level of primary health care, (b) continue to develop VHCs and train health workers in villages where VHCs do not exist to increase the number of volunteers working on nutrition and health topics, (c) widen the program with KADK to disseminate information on nutrition and health issues using local government budgets that have been set aside for this purpose, (d) further disseminate information on nutrition among adolescent girls through secondary schools, and (e) continue to build the capacity of the Food Security Unit in the Ministry of Agriculture and bolster the Scaling Up Nutrition national structure that the country joined in 2011.



**ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS**

**A. RESULTS INDICATORS**

**A.1 PDO Indicators**

**Objective/Outcome:** To increase agricultural productivity of rural households in selected areas nationwide.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Average % increase in crop productivity for WUAs	Percentage	0.00 26-Feb-2015	10.00 30-Jun-2022	10.00 30-Jun-2023	65.00 26-Jun-2023

**Comments (achievements against targets):**

**Overachieved (650% of target).** The results of the project's final impact assessment suggest that the average productivity increase for 47 crops is 65%.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Water users provided with improved irrigation and drainage services	Number	0.00 26-Feb-2015	36,600.00 30-Jun-2022	26,000.00 30-Jun-2023	34,767.00 26-Jun-2023
Water users provided with irrigation and drainage services - female	Number	0.00 26-Feb-2015	7,200.00 30-Jun-2022	2,600.00 30-Jun-2023	6,715.00 26-Jun-2023





Comments (achievements against targets):

Overachieved (134% of target). 34,767 water users gained improved access to irrigation services through the completion of rehabilitation works in 31 WUAs.

Objective/Outcome: To increase food and nutrition security of rural households in selected areas nationwide.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increase in proportion of women 15-49 years of age who consumed at least 5 food groups out of 9 food groups	Percentage	67.30	75.00	75.00	78.00
		13-Apr-2020	30-Jun-2022	30-Jun-2023	26-Jun-2023

Comments (achievements against targets):

Overachieved (104% of target). The project's final impact assessment suggests that the proportion of women 15-49 years of age who consumed at least 5 food groups out of 9 food groups increased by 78%.

A.2 Intermediate Results Indicators

Component: Rehabilitation and Modernization of Irrigation and Drainage Infrastructure

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of WUAs providing	Number	0.00	30.00	30.00	31.00



irrigation water delivery in line with agreed irrigation schedule		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023
<p><b>Comments (achievements against targets):</b>  <b>Overachieved (103% of target).</b> All 31 WUAs are providing irrigation water supply services in accordance with the agreed irrigation schedule.</p>					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Area provided with irrigation and drainage services (ha)	Hectare(Ha)	0.00	60,000.00	60,000.00	64,632.00
		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023
Area provided with irrigation and drainage services - Improved (ha)	Hectare(Ha)	0.00	60,000.00	60,000.00	64,632.00
		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023

**Comments (achievements against targets):**  
**Overachieved (108% of target)** The indicator measures the area with improved services for 31 target WUAs. The area of additional rehabilitated off-farm schemes (from the National Water Resources Management Project) and on-farm schemes (from OIP-2) are not included. As project closure, 31 WUA subprojects have been completed with an area of 64,632 ha.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Operational water user	Number	0.00	30.00	30.00	31.00



associations strengthened		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023
<p><b>Comments (achievements against targets):</b>  <b>Overachieved (103% of target).</b> All 31 WUAs under the project have been strengthened.</p>					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of successfully rehabilitated systems	Number	0.00	30.00	30.00	31.00
		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023
<p><b>Comments (achievements against targets):</b>  <b>Overachieved (103% of target).</b> Rehabilitation works have been completed in all 31 WUAs.</p>					

**Component:** Agricultural Advisory Services

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of development plans prepared and being implemented by WUAs	Number	0.00	30.00	30.00	30.00
		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023
<p><b>Comments (achievements against targets):</b></p>					



**Achieved (100% of target).** Agricultural development plans have been developed, approved and are being implemented in 30 target WUAs. (Citizen engagement indicator)

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Proportion of WUA members with evidence of increased adoption of improved crop management practices	Percentage	0.00	80.00	80.00	81.00
		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023

**Comments (achievements against targets):**

**Overachieved (101% of target).** The project's final impact assessment suggests that 81% of WUA members (farmers) put knowledge of agro-technologies into practice.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of farmers receiving seeds and fertilizers	Number	0.00	7,800.00	7,800.00	20,663.00
		13-Apr-2020	30-Jun-2022	30-Jun-2023	19-Jun-2023

**Comments (achievements against targets):**

**Overachieved (265% of target).** Seeds and fertilizers were delivered to 20,663 farmers. Target exceeded due to procurement of additional seeds and fertilizers from the project savings.



**Component: Nutrition Improvements**

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Client days of training provided	Number	0.00	7,200.00	96,900.00	150,682.00
		01-Jul-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023
Client days of training provided - Female	Number	0.00	3,600.00	79,560.00	96,938.00
		01-Jul-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023

**Comments (achievements against targets):**

1. **Overachieved (156% of target).** Component 2: 136,695 client days; Component 3: 13,987 client days; Total: 150,682 client days.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Proportion of target beneficiary participating in household nutrition campaigns	Percentage	0.00	80.00	80.00	130.50
		26-Feb-2015	30-Jun-2022	30-Jun-2023	19-Jun-2023

**Comments (achievements against targets):**

**Overachieved (163% of target).** 1) Women of reproductive age - 190,091 people; 2) Teenage girls - 57,123 people; 3) Children under 5 years old - 108,431 people. To date, 355,645 people, which is 130.5% of the total number of target beneficiaries (272,517), participated in household nutrition campaigns under the project.



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of SHG members adopting methods to improve household nutrition	Number	0.00 26-Feb-2015	9,000.00 30-Jun-2022	9,000.00 30-Jun-2023	11,100.00 19-Jun-2023
<p><b>Comments (achievements against targets):</b>  <b>Overachieved (123% of target).</b> <i>Note:</i> The unit of measurement was changed from percentage to number in 2020 during the MTR restructuring.</p>					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Grievances registered related to delivery of project benefits addressed (%)	Percentage	0.00 29-Jul-2015	100.00 30-Jun-2022	100.00 30-Jun-2023	100.00 30-Jun-2023
<p><b>Comments (achievements against targets):</b>  <b>Achieved (100% of target).</b> Since the start of the project 57 grievances (47 requests and 10 complaints) were received. All grievances were addressed.</p>					



B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Increased agricultural productivity of rural households in selected areas of the Recipient’s territory	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Average percent increase in crop productivity for WUAs</li> <li>2. Water users provided with improved irrigation and drainage services - of which female</li> </ol>
Intermediate Results Indicators	<ol style="list-style-type: none"> <li>1. Number of WUAs providing irrigation water delivery in line with agreed irrigation schedule</li> <li>2. Area provided with improved irrigation and drainage services (ha)</li> <li>3. Operational water user associations strengthened (number)</li> <li>4. Number of successfully rehabilitated systems</li> <li>5. Number of development plans prepared and implemented by WUAs</li> <li>6. Proportion of WUA members with evidence of increased adoption of improved crop management practices</li> <li>7. Number of farmers receiving seeds and fertilizers</li> </ol>
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> <li>1. 65 percent increase in agricultural productivity</li> <li>2. 34,767 farmers benefitted from improved I&amp;D services – 6,715 women</li> <li>3. 31 WUAs rehabilitated and providing improved irrigation water delivery on 64,632 hectares</li> <li>4. 31 WUAs strengthened through irrigation system rehabilitation, training in management, and provision of small grants that enabled additional services to be provided.</li> <li>5. 30 WUAs prepared and implemented Agricultural Development Plans</li> <li>6. 5,713 WUA administration staff and members trained in ADP preparation, procurement and contract management, financial management, operation of agricultural machinery, and establishment of a revolving fund</li> <li>6. 25,339 WUA members (73 percent of total members), of which 8,419 were women, trained in modern agronomic technologies</li> <li>7. 81% of WUA members adopted improved crop management practices</li> <li>8. 20,663 WUA members received good-quality certified seeds and fertilizers</li> <li>9. 65 on-farm demonstrations established showing improved water management technologies</li> </ol>
Objective/Outcome 2: Increased food and nutrition security of rural households in selected areas of the Recipient’s territory	
Outcome Indicators	<ol style="list-style-type: none"> <li>1. Proportion of households with food consumption score (FCS) above 28.5 points (pre-restructuring)</li> <li>2. Increase in proportion of women 15–49 years of age who consumed at least 5 out of 9 food groups (post-restructuring)</li> </ol>
Intermediate Results Indicators	<ol style="list-style-type: none"> <li>1. Client days of training provided - of which female</li> <li>2. Proportion of target beneficiary participating in household nutrition campaigns</li> <li>3. Number of SHG members adopting methods to improve household nutrition</li> </ol>



Key Outputs by Component  
(linked to the achievement of the Objective/Outcome 2)

1. 98% of households had FCS above 28.5 points (already achieved by completion of baseline survey)
2. 78% of women ages 15–49 years consumed at least 5 of 9 food groups
3. 150,682 client days of training provided in nutrition, health, and domestic gardening - 96,938 female
4. 1,340 Self-Help Groups formed (89.5% women) with 11,100 members and provided with good-quality seeds and season-long training





**ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION**

**A. TASK TEAM MEMBERS**

<b>Name</b>	<b>Role</b>
<b>Preparation</b>	
Pieter David Meerbach, Kunduz Masyllkanova	Task Team Leader(s)
Irina Goncharova	Procurement Specialist(s)
Nodar Mosashvili	Financial Management Specialist
Lidia Hvan	Team Member
Ju Young Lee	Team Member
Aimonchok Tashieva	Counsel
Peter Goodman	Team Member
Asli Gurkan	Social Specialist
Jasna Mestnik	Team Member
Asel Sargaldakova	Team Member
Janelle Plummer	Social Specialist
Talaibek Torokulovich Koshmatov	Team Member
Ama Esson	Team Member
Alexei Slenzak	Social Specialist
Nightingale Rukuba-Ngaiza	Counsel
<b>Supervision/ICR</b>	
Talaibek Torokulovich Koshmatov, Verena Schaidreiter	Task Team Leader(s)
Irina Goncharova	Procurement Specialist(s)
Nazgul Albanova	Financial Management Specialist
John Bryant Collier	Environmental Specialist
Aira Maria Htenas	Team Member
Natalya V. Iosipenko	Team Member
German Stanislavovich Kust	Environmental Specialist
Togzhan Alibekova	Team Member
Kunduz Ermekbaeva	Procurement Team
Syrga Asanalieva	Social Specialist
Adis Medetov	Procurement Team
Tatyana Shadrunkova	Team Member



Cecilia Belita	Team Member
Sylvie Ngo-Bodog	Team Member
Davor Smiciklas	Team Member



**B. STAFF TIME AND COST**

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
<b>Preparation</b>		
FY13	3.220	32,135.97
FY14	16.929	127,337.27
FY15	21.829	66,912.82
FY16	12.868	50,218.28
FY17	17.717	86,881.99
FY18	0	0.00
<b>Total</b>	<b>72.56</b>	<b>363,486.33</b>
<b>Supervision/ICR</b>		
FY16	.050	174.72
FY17	2.567	55,649.23
FY18	17.862	114,328.09
FY19	19.816	95,178.54
FY20	27.657	151,163.02
FY21	18.533	86,834.86
FY22	16.388	101,514.04
FY23	13.280	95,044.61
FY24	6.714	55,421.44
<b>Total</b>	<b>122.87</b>	<b>755,308.55</b>



**ANNEX 3. PROJECT COST BY COMPONENT**

Components	Amount at Approval (US\$, millions)	Actual at Project Closing (US\$, millions)	Percentage of Approval (%)
Rehabilitation and Modernization of Irrigation and Drainage Infrastructure	28.00	25.17	89.89
Agricultural Advisory Services	3.50	7.34	209.71
Nutrition Improvements	4.60	2.93	63.70
Project Management	1.80	2.56	142.22
<b>Total</b>	<b>38.00</b>	<b>38.00</b>	<b>100.00</b>



## ANNEX 4. EFFICIENCY ANALYSIS

### Economic and Financial Analysis at Project Appraisal and MTR

1. At the appraisal stage, the economic and financial analysis (EFA) was carried out through quantification of expected agricultural and nutrition benefits. The expected benefits included (a) improved productivity of irrigated crops due to improved access to irrigation and better farm practices, (b) improved agricultural profitability through crop diversification by replacing old cropping patterns with cash- and nutrient-rich crops, (c) avoided workforce losses resulting from nutrition-related mortality, and (d) productivity losses due to undernutrition among children under five.
2. The financial analysis was conducted based on indicative per hectare crop budgets applying different cropping patterns corresponding to the agroclimatic conditions of different project regions. Ultimately, these per hectare models were extrapolated to the total command area of the irrigation and drainage (I&D) infrastructure rehabilitated by the project. The financial prices were converted into economic prices using specific conversion factors and the overall economic net incremental benefit stream was identified from I&D investments. Additionally, the expected net incremental benefits from nutrition component were added to the overall stream to calculate the project economic net-present value ENPV and economic internal rate of return (EIRR). As a result, the appraisal stage EIRR was estimated at 26.3 percent, while the ENPV was US\$48.2 million.
3. At the project MTR, the appraisal EFA was updated using the actual data on disbursement and productivity of some WUAs to date, by keeping the original assumptions and methodology but adjusting the phasing of benefits. The analysis also updated the prices using 2019 values. The economic indicators were recalculated taking into account the delay in implementation, which resulted in the updated EIRR of 21.7 percent and ENPV of US\$20.5 million.

### Economic and Financial Analysis at Completion

4. At completion, an ex post economic and financial analysis was conducted based on project investments to assess the project's overall effect, particularly using the actual beneficiary number/implementation of subprojects and the actual project expenditures schedule. The data were made available from the M&E and FM specialists of the PIU. The purpose of the analysis is to measure the attainment of the project's goal to increase agricultural productivity and food and nutrition security of rural households in selected areas nationwide.
5. The actual expenditures are in accordance with the disbursement plan that reflects the restructuring proposed in March 2020 in the context of COVID-19 emergency response to support the government's efforts to mitigate emerging risks to food security and ensure sustainability of agricultural production. The proposed restructuring increased funding under Component 2 to allow for procurement and provision of seeds and fertilizers for planting seasons in the fall of 2020 and spring 2021 to around 7,800 farmers in 30 participating WUAs to respond to the country's needs to ensure sustainability of food security. The required amount for seeds and fertilizers was estimated to be around US\$2.27 million.
6. These funds were reallocated from subcomponent 3.2, since there was insufficient progress, and the activity was no longer a government priority. The subcomponent was cancelled. This was accompanied by removing the indicator on 'Proportion of households with food consumption score (FCS) above 28.5 points (percentage)' and introduction of a new indicator 'Increase in proportion of women 15–49 years of age who consumed at least 5



out of 9 food groups (percentage)’. The financial gap was covered by significant cost savings from Components 1 and 2.

**I. Program Cost and Outreach**

7. **Project costs and financing.** The project was financed through a grant of US\$38.0 million, provided by GAFSP, a multi-donor trust fund. The grant was implemented as a Recipient-Executed Trust Fund (RETF). The original allocations for the four components were US\$28.0 million, US\$3.5 million, US\$4.6 million, and US\$1.9 million. Table 4.1 sheds light on the actual expenditures by year and reflects the restructuring adjustments to the original design described above.

**Table 4.1. Actual Expenditures by Components and Years (US\$, millions)**

Project Year	1	2	3	4	5	6	7	8	Total
<b>Fiscal year</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	
Component 1. Rehabilitation and Modernization of I&D Infrastructure	519.42	886.30	4087.02	5693.66	3657.1	5582.28	4302.41	452.72	<b>25180.91</b>
Component 2. Agricultural Advisory Services	0.22	3.92	442.47	507.94	826.5	1829.79	3012.51	775.75	<b>7399.10</b>
Component 3. Nutrition Improvements	0.00	9.23	501.19	1068.94	643.31	523.85	139.84	25.29	<b>2911.65</b>
Component 4. Project Management	21.90	250.96	475.44	439.22	447.04	291.76	343.02	238.99	<b>2508.33</b>
<b>Total</b>	<b>541.55</b>	<b>1150.41</b>	<b>5506.12</b>	<b>7709.76</b>	<b>5573.95</b>	<b>8227.68</b>	<b>7797.78</b>	<b>1492.75</b>	<b>38000.00</b>

8. **Project outreach.** According to the M&E database, the main physical targets of Components 1 and 2 were exceeded. Under Component 1, instead of the planned rehabilitated and modernized irrigation systems in 30 WUAs, the project supported 31 WUAs (103 percent achievement). For timely maintenance of I&D systems, excavators were provided to 16 of these WUAs based on demand. Ultimately, this resulted in 34,767 beneficiaries with improved I&D services (target - 36,600, achievement - 97 percent) on 64,632 ha (target - 60,000 ha, achievement - 108 percent), meaning that the originally estimated average area per household was slightly less than reality, while the overachievement is due to the 31st WUA, which was not in the original plan.

9. For Component 2, all planned 30 ADPs were prepared and grant agreements approved. Moreover, 65 demonstrations plots were established, and 20,633 farmers/members of the 30 WUAs received seeds and mineral fertilizers (target - 7,800, achievement - 265 percent).

10. Under Component 3, against the targeted 9,000 members of SHGs, the project supported 11,100 people (122 percent achievement). The proportion of households participating in Component 3 activities was well above the planned 80 percent of the total target (achievement - 115 percent), which shows that the facilitators managed to involve people from adjacent WUAs,

11. **Project benefits.** The agricultural benefits were expected from multiple sources including (a) improved productivity of irrigated crops due to improved water supply and adoption of better farm practices and (b) improved agricultural profitability through crop diversification toward increased production of cash- and nutrient-rich crops and better marketing practices. Due to the cancelation of Subcomponent 3.2, the ICR EFA excluded the benefits from the nutrition component related to households with FCS above 28.5 points.

12. **Unquantifiable benefits.** It was rather difficult to estimate the benefits under the changed nutrition indicator (Increase in proportion of women 15–49 years of age who consumed at least 5 of 9 food groups), as there was no evidence of how this could be translated into a benefit stream and what would be the attribution rate of the project. Other unquantifiable benefits included (a) overall economic development in the agricultural sector due to an improved extension system and capacity building, (b) multiplier effect from the improved economic activity



in the rural areas, (c) losses of water avoided due to improved and efficient I&D infrastructure, (d) avoided salinization and degradation of soil associated with efficient irrigation and enriched cropping patterns/crop rotation, and (e) mitigation of greenhouse gas emissions due to avoided salinization and degradation of soil.

II. General Assumptions Used in the Analysis

13. The ICR EFA used the same set of crop models as at design and MTR. Although during the eight years of project implementation significant economic changes took place, for example, devaluation of the Kyrgyz som, increase of all prices and the COVID-19 pandemic, most of the design stage general assumptions were validated at the ICR. There were also some differences in the methodology of the ICR analysis with the design and MTR stages that are shown in table 4.2. The analysis also takes the two-year delay in the implementation into account. The following were the main ICR assumptions:

- (a) The financial analysis aimed to quantify incremental benefits attributable to the project by comparing projections (based on scenarios) of crop performances ‘with’ and ‘without’ project.
- (b) ‘With project’ projections correspond to actual but still realistic and conservative estimates of yield increases and modified cropping patterns resulting from improved water supply.
- (c) In the ‘without project’ scenario, it is assumed that present cropping patterns and applied agricultural technology continued for the entire project lifetime.
- (d) In the ‘with project’ scenario, it was expected that the full command area would be adequately irrigated for the project lifetime.
- (e) Values are expressed in constant 2022 prices and excluded inflation.
- (f) Prices were converted into economic values in the analysis by applying conversion factors received from calculating import and export parity prices based on World Bank’s Pink Sheet projections and United Nations ComTrade data. The standard conversion factor used in the analysis was 0.89.
- (g) The crop budgets show incremental revenues and costs generated by the proposed I&D investment. The financial discount rate of 13.0 percent<sup>37</sup> is used in this analysis to assess the viability and robustness of investments, which is the current opportunity cost of capital to a beneficiary. The selection criterion for the IRR is to accept all projects for which the IRR is above the opportunity cost of capital. The economic or social discount rate of 6.0 opportunity cost of capital<sup>38</sup> is applied for the economic analysis, which is a social opportunity cost.
- (h) The exchange rate used in the financial and economic analysis was fixed at US\$ 1 = KGS 88.2, with a strong assumption that future inflation of inputs will be outweighed by increase in output prices.
- (i) Family labor is not assumed as a financial cost but the opportunity cost has the same economic value as hired labor.

Table 4.2. Differences in Methodology at Different Stages of the Project

Indicator/Variable	Design	MTR	ICR	Description
Financial discount rate	10% for agricultural benefits, 5%	10% for agricultural benefits, 5% for	13%	The ICR EFA differentiates between financial and social (economic) discount rates, where the financial

<sup>37</sup> Policy rate as of October 2021. National Bank of the Kyrgyz Republic, <https://www.nbkr.kg/>.

<sup>38</sup> The social discount rate used for the economic analysis is based on World Bank’s estimates, proposed by a standardized methodology. See Discounting Costs and Benefits in Economic Analysis of World Bank Projects, OPSPQ. May 9, 2016. “Where no country-specific growth projections are available, we suggest using 3% as a rough estimate for expected long-term growth rate in developing countries. Given reasonable parameters for the other parameters for the other variables in the standard Ramsey formula linking discount rates to growth rates, this yields a discount rate of 6%.”



	for nutrition benefits	nutrition benefits		discount rate equals the policy rate set by the National Bank of Kyrgyzstan, and the social discount rate is 6%, the globally suggested standard rate for World Bank projects.
Social (economic) discount rate	10% for agricultural benefits, 5% for nutrition benefits	10% for agricultural benefits, 5% for nutrition benefits	6%	
Analytical period	25 years	20 years	20 years	According to engineers involved in the APNIP, the confirmed economic lifetime of the irrigation and drainage infrastructure is 20 years.
Increase in yields	15% yield increases for all field crops and 10% increase for orchards	A 10% yield increase assumption was used in almost all crop models.	Varies by crops and regions	At the design and MTR stage EFA, the experts made estimates based on conservative assumptions, while at the ICR the endline evaluation results are available.
Adoption rate (%)	80%	80%	65%	The adoption rate was adjusted to the actual findings of the endline evaluation

### III. Financial Analysis

14. The endline evaluation conducted in 2022 showed an increase in the weighted average productivity level of 65 percent for all 47 types of crops in comparison with the level of the base evaluation of 2018. Table 4.3 shows the results of the endline evaluation of some key crops. When observing the baseline productivity (measured in tons per hectare) of targeted WUAs and their adjacent counterparts, a noteworthy trend emerges: a significant number of adjacent WUAs had higher productivity levels compared to the targeted WUAs. This observation aligns with the selection methodology outlined in the APNIP, where it was articulated that out of the nationwide pool of 481 WUAs, the 30 highest-ranking non-rehabilitated WUAs, meeting the predefined selection criteria, were designated for rehabilitation and provision of equipment as primary targets.

15. This indicates that the WUAs chosen as targets had inferior initial conditions concerning irrigation and drainage services compared to their adjacent counterparts. Over a five-year period of dedicated APNIP support, the targeted WUAs managed to attain a level of productivity increase (%) comparable to that of the adjacent WUAs. Furthermore, they exhibited higher productivity (measured in tons per hectare) for the specific crops listed in the table, surpassing the productivity achieved by their adjacent counterparts. Additionally, it is important to acknowledge that the APNIP extended the implementation of activities from Components 2 and 3 to the adjacent AAs as well. In cases where a robust irrigation infrastructure was already in place, these adjacent AAs experienced a remarkable productivity surge of up to 60.7 percent from the initial baseline. This outcome underscores the significant positive impact achieved by the APNIP in the adjacent regions, highlighting its effective performance in enhancing agricultural productivity.





Table 4.3. Results of the Endline Evaluation

Crop	Target WUAs			Adjacent WUAs			All WUAs		
	Without Project (Baseline), t/ha	With Project (End-line), t/ha	% Increase	Without Project (Baseline), t/ha	With Project (End-line), t/ha	% Increase	Without Project (Baseline), t/ha	With Project (End-line), t/ha	% Increase
Wheat (Winter and Spring)	2,043	2,975	45.7	2,206	3,182	44.2	2,129	3,029	42.3
Barley (Winter and Spring)	1,739	2,951	69.7	2,154	2,105	-2.3	1,970	2,621	33.0
Maize (Corn)	2,979	7,666	157.3	3,382	7,059	108.7	3,122	7,454	138.8
Lucerne/Clover	3,439	6,343	84.5	3,145	5,102	62.3	3,310	5,854	76.9
Esparcet	5,230	6,666	27.5	6,457	5,147	-20.3	5,747	6,002	4.4
Cotton	2,490	3,216	29.2	2,855	3,490	22.2	2,607	3,342	28.2
Beans/Kidney Beans	1,039	1,327	27.7	1,016	1,037	2.0	1,030	1,163	13.0
All Crops	0.071	0.117 <sup>1</sup>	64.6	0.083	0.133	60.7	0.072	0.134	86.9

16. **Crop models.** The financial analysis is based on crop budgets, that is, two sets of typical input-output models of various crops based on observed practices—one set for the south, another for the north. The southern regions cover Osh, Jalalabad, and Batken oblasts, while the northern regions include Issyk-Kul, Talas, Chui, and Naryn oblasts. Considering the findings of the endline evaluation, the EFA adopted more conservative assumptions on yield increase based on WUA reports and expert opinions. Table 4.4 summarizes different examples of crop performances in project areas ‘without’ and ‘with’ project and their financial net returns per hectare. Yields vary somewhat from one scheme to another.

Table 4.4. Crop Performance in the Project Areas with and without Project

Crop	Yield (ton/ha)			Net Return per ha (KGS/ha)		
	Without Project	With Project	Change (%)	Without Project	With Project	Incremental (KGS)
Winter wheat (for example, Talas, North)	2.37	3.08	+30	8,913	27,780	18,867
Barley (for example, Issyk-Kul, North)	1.80	2.25	+25	12,374	22,299	9,925
Melon (for example, Osh, South)	15.80	18.80	+19	213,609	286,803	73,194
Potato (for example, Naryn, North)	12.10	14.76	+22	92,502	160,333	67,832
Beans (for example, Chui, North)	1.04	1.32	+27	7,828	33,269	25,441
Cotton (for example, Osh, South)	2.70	3.49	+29	7,969	41,966	33,997
Oilseeds (sunflower) (for example, Jalal-Abad, South)	1.03	1.67	+63	4,431	23,864	19,433
Lucerne (for example, Naryn, North)	3.44	4.64	+35	7,376	23,037	15,661
Maize (for example, Talas, North)	3.00	4.20	+40	13,589	40,509	26,920
Rice (paddy) (for example, Jalal-Abad, South)	2.40	2.68	+11	152,644	182,573	29,929
Fruits and berries (apple) (for example, Issyk-Kul, North)	9.30	12.65	+36	197,475	288,305	90,930
Vegetables and HG (tomato) (for example, Batken, South)	8.00	9.84	+23	144,608	215,511	70,903

17. **Farm models** were prepared to assess the project’s impact at the household level. Typical farm models were prepared based on average farm sizes observed in the two regions where rehabilitation of irrigation schemes was introduced: the northern regions - 4.23 ha and the southern regions - 1.05 ha. Table 4.5 summarizes the farm model analysis results.



Table 4.5. Farm Models with and without Project

Farm Model	Location	Area (ha per household)	Net Agricultural Benefit per HH				Change (in %)
			Without Project		With Project		
			KGS	US\$	KGS	US\$	
1	North	4.23	105,374	1,195	222,482	2,522	+111%
2	South	1.05	46,562	528	82,665	937	+78%

IV. Economic Analysis

18. The economic analysis aims to assess country-level project impact and includes the following three steps: (a) converting financial prices into economic values (using the conversion factors and removing the value added tax of 12 percent) to assess the real costs and benefits from the social (country) point of view, (b) undertaking economic analysis of the overall project by aggregating all costs and benefits, and (c) performing a sensitivity analysis. Compared to the design and the MTR assumed adoption rate of 80 percent, the ICR analysis applied a 65 percent adoption to the models, which is the finding of the endline evaluation.

19. The ex-post economic analysis demonstrates an overall ERR of 28.7 percent with an ENPV estimated at US\$59.3 million, which proves the economic viability of the project.

20. **Sensitivity analysis.** Economic returns were tested against changes in benefits and costs and for various lags in the realization of benefits. In relative terms, the ERR is equally sensitive to changes in costs and benefits. In absolute terms, these changes do not have a significant impact on the ERR, and the economic viability is not threatened by both a 20 percent decline in benefits and by a 20 percent increase in costs, as the ERR in both cases remains well above the discount rate. A two-year delay in project benefits reduces the ERR to 19.6 percent. The results are presented in table 4.6.

Table 4.6. Sensitivity Analysis

Scenarios	ERR (%)	ENPV (USD)
Base case	29.2%	61,601,879
Costs increase by 20%	24.9%	56,321,048
Benefits decline by 20%	23.9%	44,000,673
Costs increase by 20% and Benefits decline by 20%	20.0%	38,719,842
Benefits accumulation delay by 2 years	20.1%	44,369,078
No diversification	27.0%	54,113,257

21. **Discussion and conclusion.** Despite the nutrition-related indicators and benefit streams being removed, the ex-post (ICR) analysis ERR and ENPV are higher than the ex-ante (design and MTR) analyses results for several reasons: (a) the actual yield increase in the ‘with project’ scenario compared to the ‘without project’ scenario appeared to be much higher than the conservatively estimated 10 percent and 5 percent increases at the design and MTR stages; (b) the social (economic) discount rate was revised to 6 percent, which resulted in the increased ENPV; and (c) the actual physical achievements in terms of hectares in the command area turned out to be higher than the estimated. All these points validate the project’s overarching accomplishment and high efficiency.



**ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS**

Note: The draft ICR was shared with the borrower for comments on November 17, 2023, and responses received from the Ministry of Finance of the Kyrgyz Republic and from the Water Resources Service of the Ministry of Agriculture of the Kyrgyz Republic were as follows:

**КЫРГЫЗ РЕСПУБЛИКАСЫНЫН  
ФИНАНСЫ МИНИСТРЛИГИ**



**МИНИСТЕРСТВО ФИНАНСОВ  
КЫРГЫЗСКОЙ РЕСПУБЛИКИ**

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28.11.2023 № 16-4/14823



№

**Офис Всемирного банка  
в Кыргызской Республике**

Министерство финансов Кыргызской Республики (далее – Министерство) свидетельствует свое уважение Всемирному банку и выражает признательность за поддержку в реализации приоритетных социально - экономических проектов и сообщает следующее.

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Заместитель министра

Р.С.Татиков



**Translated Version**

**On the letterhead of the Ministry of Finance**

**Ref. No: 16-4/14883**

**Date: November 28, 2023**

**Attention of: World Bank Country Office**

**in the Kyrgyz Republic**

**The Ministry of Finance of the Kyrgyz Republic (hereinafter the Ministry) extends its compliments and recognition to the World Bank Office in the Kyrgyz Republic for continued support in implementation of key social and economic development projects. Please kindly be informed of the following.**

**The Ministry has no comments with regards to the submitted Implementation and Results Report for the Agriculture Productivity and Nutrition Improvement Project and does not object to its publication.**

**On behalf of the Ministry, I would like to take this opportunity and reiterate our highest consideration and esteem to the World Bank.**

**Deputy Minister**

**/Signed/**

**Tatikov R.S.**



**КЫРГЫЗ РЕСПУБЛИКАСЫНЫН  
АЙЫЛ ЧАРБА  
МИНИСТРЛИГИ**

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**MINISTRY OF AGRICULTURE OF THE  
KYRGYZ REPUBLIC**

**WATER RESOURCES SERVICE  
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№ \_\_\_\_\_

**Country Manager  
of the World Bank  
in the Kyrgyz Republic  
Mr. Naveed Hassan Naqvi**

**Regarding:** Kyrgyz Republic – GAFSP Grant  
TF0A0645 Agricultural Productivity and Nutrition  
Improvement Project  
Borrower's comments on the draft Completion and  
Performance Report.

**Dear Mr. Naqvi,**

The Water Resources Service under the Ministry of Agriculture of the Kyrgyz Republic expresses its gratitude to the World Bank and the International Development Association for the financial and administrative support provided in the implementation of projects aimed at reforms and modernization of the water sector of the Kyrgyz Republic.

As noted in the Completion and Performance Report on the Agricultural Productivity and Nutrition Improvement Project, the project contributed to improving irrigation infrastructure, increasing agricultural productivity and building the capacity of beneficiaries in project WUAs, thus making a considerable contribution to regional development, in particular to ensuring national food security in the country.

Taking into account the above, the Water Resources Service expresses its agreement with all recommendations reflected in the report and assures that these recommendations will be taken into account in the implementation of future projects.

At the same time, the Water Resources Service would like to thank the World Bank and the International Development Association for their close and fruitful cooperation during the implementation of the Project.

**Director**

**A. Sokeev**



*The draft ICR was shared with GAFSP for comments on October 30, 2023, and responses received from GAFSP were as follows:*

**Comments from GAFSP**

From: Funda Canli <[fcanli@worldbank.org](mailto:fcanli@worldbank.org)>

Date: 14 December 2023 at 22:23:35 GMT+6

To: Talaibek Torokulovich Koshmatov <[tkoshmatov@worldbank.org](mailto:tkoshmatov@worldbank.org)>

Cc: GAFSP WB SE <[GAFSP\\_WB\\_SE@worldbankgroup.org](mailto:GAFSP_WB_SE@worldbankgroup.org)>, [dglugg@gmail.com](mailto:dglugg@gmail.com), Verena Schaidreiter <[vschaidreiter@worldbank.org](mailto:vschaidreiter@worldbank.org)>, Cecilia Belita <[cbelita@worldbank.org](mailto:cbelita@worldbank.org)>

Subject: RE: APNIP ICR for your review by November 6, 2023

Dear Talai,

Congratulations on completing the ICR for Kyrgyz Republic - Agricultural Productivity and Nutrition Improvement Project (APNIP). GAFSP CU has shared the below comments, you can put them in Annex 5 to finalize the ICR. Let us know if you have any other questions!

**Subject:** RE: Kind reminder: For CU Review and Comments - ICR for Kyrgyz Republic - Agricultural Productivity and Nutrition Improvement Project (APNIP)

Dear WB GAFSP SE colleagues,

Thank you for sharing the final ICR of the Kyrgyz Republic - Agricultural Productivity and Nutrition Improvement Project (APNIP) funded by the GAFSP.

We would like to commend the team for the good results, and exceeding its targets in regards with increase in crop productivity and increase in nutrition security by increasing dietary diversity and through nutrition training.

We note that GAFSP financing provided an opportunity to support a comprehensive cross-sectoral approach comprising irrigation, agriculture, and nutrition, and hope that lessons learned in this project, will be useful for future projects funded by the World Bank.

Thanks, and congratulations again for these good results.

Aimee on behalf of the GAFSP CU

**Aimee Mpambara**

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**ANNEX 6. BORROWER'S ICR SUMMARY REPORT**

*Note: This ICR Summary was prepared by the Project Implementation Unit in the Water Resource Services of the Ministry of Agriculture representing the Borrower and as such it is presented verbatim.*

1. The Water Resources Service under the Ministry of Agriculture of the Kyrgyz Republic (WRS) implemented the project “Improving Agricultural Productivity and Nutrition”, funded by the Global Agriculture and Food Security Program, and the funds were administered by the World Bank from September 14, 2016, to June 30, 2023. The total cost of the project was US\$ 38.0 million in the form of a 100% grant.
2. Two restructurings have taken place during the implementation of the APNIP Project: the *first* restructuring was carried out on July 22, 2020, in the context of a broad response to COVID-19 emergencies to support the efforts of the Government of the Kyrgyz Republic to mitigate emerging food security risks and ensure the sustainability of agricultural production. The change concerned the abolition of the implementation of sub-component 3.2: Provision of micronutrients. Also, unused funds of Component 1 were redirected to the implementation of additional activities for other components. Thus, the actual cost for Component 1 was \$26.25 million, and for Component 3 was \$3.70 million. Unused funds were redirected to Component 2 – a budget increase of \$1.69 million and to Component 4 - an increase in the budget of \$ 950 thousand. Additional funds were used to purchase mineral fertilizers and seeds for WUAs to distribute among WUA farmers, and to cover additional operating costs due to the transfer of the main consultants for Component 2 to the main project staff.
3. *Second* restructuring was carried out on February 24, 2022, when the closing date of the Project was changed with an extension for one year.
4. Costs by Project Components with the indication of changes in the allocation of amounts:

<b>Component</b>	<b>Initial amount (million US\$)</b>	<b>Revised amount (million US\$)</b>	<b>Budget for the revised procurement plan, approved June 2023 (thousand US\$)</b>
Component 1. Rehabilitation and modernization of drainage and irrigation infrastructure	28.0	26.25	25,174.0
Component 2. Agricultural advisory services	3.50	5.19	7344.4
Component 3. Measures to improve the quality of nutrition	4.60	3.70	2927.4
Component 4. Project management	1.90	2.85	2554.2
<b>Total</b>	<b>38.0</b>	<b>38.0</b>	<b>38,000.0</b>

5. Project Development Objectives were to increase agricultural productivity, improve food security and ensure the nutrition of rural households in certain areas in the territory of the Kyrgyz Republic. So, the Project consisted of the following 4 components:

- (a) *Rehabilitation and modernization of irrigation and drainage infrastructure.* Increasing agricultural productivity and providing access to appropriate water resources for agricultural needs by: (a) rehabilitating and upgrading selected existing irrigation and drainage systems; (b) ensuring the maintenance of the equipment of Water Users Associations (WUAs) and WUA Federations; (c) provision



of off-farm irrigation infrastructure and water meters; and (d) conducting a scoping exercise for major off-farm facilities.

- (b) *Agricultural advisory services:* (a) providing training and technical advisory services to (i) participating WUAs on the rehabilitation of irrigation drainage systems; and (ii) participating WUAs for the preparation and implementation of Agricultural Development Plans; (b) providing Small Grants to participating WUAs for the implementation of Agricultural Development Plans; (c) providing technical advisory services and promoting knowledge dissemination by (i) supporting exchange visits with participating and non-Project WUAs to demonstrate exemplary agricultural practices; (ii) conducting public awareness campaigns; and (iii) publishing newspaper articles and studies on agricultural development; and (d) conducting demonstration activities for the management of on-farm irrigation facilities
- (c) *Nutrition improvement:* (a) Conduct a home food culture education program for women, children and adolescent girls to improve the quality of home eating. (b) providing targeted groups of women and children with micronutrient supplements to improve their nutritional quality. (c) undertaking activities aimed at improving the quality of home nutrition and meeting the dietary needs of households through: (i) improving home gardening and providing home gardening opportunities; (ii) identifying low-income families for food assistance; (iii) formation of women's self-help groups; (iv) establishing community seed banks; (v) conducting a detailed technical assessment of current agronomic and production practices, the condition of seeds and crops, soil fertility and quality control; (vi) development of home garden production guidelines and demonstration materials; (vii) establishing demonstration plots. (d) improve coordination of food security and nutrition issues at the national level by: providing support to the Food Security Council (FSC) in the performance of its responsibilities, including but not limited to the coordination, oversight and monitoring of the Recipient's programs in the field of food security and complete nutrition.
- (d) *Project management.* (a) strengthening the institutional capacity of the PIU for the implementation of Project management activities, including administration, coordination, monitoring and evaluation of the Project, through training, provision of equipment and financing of Operational Costs.

6. The theory of change adopted by the Project was to use a multi-sectoral approach aimed at: i) increasing agricultural productivity by restoring and upgrading drainage and irrigation infrastructure; and ii) providing safe nutritious food to rural households in selected areas of the republic, through the provision of agricultural advisory services to selected *aiyl aimaks* in order to increase the productivity of irrigated lands and increase access to markets; increasing the level of productivity, food security and quality nutrition of beneficiaries, primarily among women, girls and children, living in selected 60 *aiyl aimaks*.

7. **Main beneficiaries.** The Project was the population and the Water Users Association (WUA) in 31 *aiyl aimaks* (AA). Approximately 60,000 hectares of on-farm drainage and irrigation systems managed by 31 WUAs and WUA Units (UWUAs) located in 31 AAs are to be rehabilitated and managed more effectively. About 36,000 small farms and farm families (about 162,000 people in total) have benefited from the rehabilitation of drainage and irrigation systems. In addition to the data from the 30 AAs, an additional 30 AAs were selected based on poverty, health, and nutrition to provide agricultural advisory services and directions for improving crop nutrition. Consulting services to increase crop yields and improve their marketing and improved on-farm water management were provided to approximately 50,400 WUA members and their households in a selected 60 AAs. In addition, the Nutrition Improvement Program has benefited all 425,000 residents of these 60 AAs, particularly vulnerable families, women, and children.





8. The main instrument for the implementation of interventions to the final beneficiaries of the Project, according to the Operational Manual of the Project, was the work on social mobilization and the creation of self-help groups. The activity covered 60 AAs, where 30 AAs are target WUAs and an additional 30 neighboring nearby AAs. During the project implementation period, 1,340 self-help groups (SHGs) have been established and are functioning in 246 target villages. They have been created within the framework of the project in 7 regions of the republic with a total of 11,100 participants. The largest number of SHGs were formed in Osh oblast (244 SHGs), and the smallest number in Talas oblast (44 SHGs). It should be noted that Jalal-Abad, Batken, Issyk-Kul, and Talas regions carried out their project activities for 2 years only.

9. The main criteria for selecting target villages were - Absence of similar projects: to increase the coverage of villages with project support and reduce duplication in this direction, when selecting villages, the regional coordinators of the Agency of Development Initiatives (IDA) considered and started work in villages that were not previously covered by similar projects. Information about the villages and the lack of such projects in the villages was provided by the local authorities; Support and interest of local WUAs and local self-government bodies (LSGs) in participating in the Project: during the information meetings, special attention was paid to the interest and willingness to support representatives of local WUAs and LSGs in the implementation of the Project and in working with the local population; Willingness and willingness of villagers to participate in the project:

10. According to the plan, in carrying out social mobilization, the project paid special attention to the participation of women, who are the most vulnerable in rural areas. In total, 11,100 people were mobilized during the project implementation period, of which 9,939 people were women (89.5%).

11. Since the start of the project on May 31, 2023, rehabilitation work has been completed in 31 WUAs / 40 contracts with a length of 336 km in the amount of USD 19,603,830, 110 gauging stations have been built, 2,795 units have been built. Various facilities and 34,767 beneficiaries received access to irrigation water on 64,632 hectares. For the timely maintenance of irrigation and drainage systems of the WUA, 32 excavators were purchased in the amount of \$1.245 million.

12. Additionally, work was carried out to rehabilitate inter-farm irrigation systems. For 6 pilot inter-farm canals in the amount of 791,257 US dollars: mechanized cleaning of drains was carried out - 14.3 km, 46 instrumentation was installed, 32 gauging stations were rehabilitated, 14 gauging stations and 26 other hydraulic structures were built.

13. In addition, for the project "Additional Financing for the Second On-Farm Irrigation Project", rehabilitation works were carried out at 7 objects of on-farm systems in the amount of \$1.097 million. As a result, 31.98 km of canals were rehabilitated, 15 gauging stations were built, and other structures on the canals - 238 units, as a result of which water supply was improved on an area of 13,861 hectares.

14. In general, the APNIP has led to positive changes in the field of agriculture and dietary diversity in the project and adjacent communities. Particularly positive is the fact that the Project support was gender-balanced and involved various categories of beneficiaries in terms of the socio-economic status of the household (by income level, land plot size, etc.). Improved access to irrigation has enabled vulnerable households and SHGs to grow crops and farm more efficiently. They also expanded the list of cultivated crops, with a focus on crops for which seed distribution was carried out.



15. According to the final independent evaluation of the Project, access to irrigation water has doubled: the supply of irrigation water has improved (most of all in the project WUAs - 83% of farmers confirmed the improvement), the time for delivering water to land plots has been reduced (1.5 times more farmers within one hour), conflicts on the grounds of irrigation were reduced due to a decrease in cases of violation of the water supply schedule (for 63% of farmers the schedule is not violated), the systematic work of WUAs in terms of financial sustainability through the collection of membership fees and holding general meetings (41% and 71 % respectively). The targets for coverage of beneficiaries with improved irrigation and drainage services, the number of restored systems for WUAs, and the strengthening of water user associations were met considering the gender balance of this support.

16. Also, the final independent assessment showed that with an (approximately) similar crop structure in 2022, it was possible to get 65% more yield (tons) from one hectare of land than in 2018. At the same time, for three-grain crops (corn, barley, and wheat), the yield increase was 93%. It was for these crops that the Project purchased and provided seeds. The average yield of various crops in the project WUAs in most cases became higher than in adjacent WUAs. There is a significant increase in fodder root crops and vegetables, the development and volume of the crop which directly depended on the availability of irrigation water, as well as on the issuance of seeds and seedlings by the APNIP.

17. The economic well-being of farms targeted by APNIP also improved significantly. The increase in the volume of the harvest led to an increase in sales and, accordingly, to an increase in household income.

18. Project support in terms of providing facilities and equipment is also quite effective. A third of the interviewed farmers received fertilizers, just over a third of farmers (61% of randomly selected and interviewed farmers received seeds for sowing a wide range of crops or mineral fertilizers) and more than half of the SHG participants confirmed the provision of seeds and seedlings for farming in the field / on a personal plot (100% received seeds for growing vegetables). 98.3% of farmers were satisfied with the quality of the provided seeds, which indicates the high quality of the seeds.

19. Changing the diversity and balanced nutrition of women of reproductive age, children and adolescents also demonstrate the successful communication of project activities with beneficiaries. The changes are significant enough for chance or external factors. It is safe to say that the well-coordinated work of the APNIP staff with local healthcare institutions played an important role in achieving and consolidating these indicators. It is especially important that 1.5 times more families where the main breadwinner is a woman confirmed that their diet has become varied, and the fact that participation in information events significantly motivated beneficiaries to maintain a proper, balanced and varied diet, as well as food consumption, rich in iron and vitamin A.

20. Prenatal care indicators also improved significantly, women began to pay more attention to the health of mother and child, take iron tablets / syrups, iron-folic acid tablets for the required amount of time. The attitude to feeding the child and his health among mothers and guardians has also changed significantly. Twice as many mothers began to breastfeed a child up to 6 months of age, the percentage of those introducing complementary foods at six months of age has increased, according to WHO regulations, the proportion of children receiving the optimal frequency of feeding has also increased. Women's hygiene and sanitation rates have improved, the practice of boiling water has improved, and sanitary conditions have also been upgraded.

21. To obtain the share (%) of the change in agricultural productivity, the yield of each crop of each farmer was weighted by the size of the cultivated plot and by the area of the crop produced in the total agricultural area of the project areas. Based on the results of the final assessment in 2022, the indicator reflected an increase in the



weighted average productivity of 65% by 47 types of agricultural crops compared to the level of the base assessment in 2018. The target was an increase of 10% and thus the Project exceeded the expected results by 6.5 times.

22. If we compare the yield of project WUAs with the official data of the National Statistical Committee of the Kyrgyz Republic, we can see that for some crops the yield corresponds to the level of the country (melons, clover, carrots, sugar beets, legumes), for others it exceeds (sainfoin, grapes, apples, peppers, onion, barley, wheat, corn), according to the third - it is lower than the national one (tobacco, cotton, cucumbers, fruits and berries, some vegetables). The analysis by oblasts, separate zones of which participated in the APNIP, showed that the Project was most effective in Talas, Osh and Batken oblasts. The least in the Issyk-Kul region.

23. Despite significant gains across a wide range of crops, the results of the assessment also identified crops that were experiencing reduced yields. These are such plants and crops as grapes (-61%), tobacco (-50%), apricots (-20%), carrots (-19%), rice (-10%), cherries (-4%). Despite the decline compared to the 2018 season, this should not be taken as a decline in the literal sense. For example, in 2022 farmers harvested 2.3 tons per hectare of grapes in the APNIP project areas (on average), while official data for the country indicate a yield in 2022 of 1.7 tons per hectare. That is, despite the decline compared to 2018, the yield in the project areas still remains above the national level.

24. The number of water users with access to improved irrigation and drainage services based on the results of the impact assessment showed significant changes in access to irrigation water by farmers in both the project and adjacent villages. So, if in 2018, as part of the baseline assessment, only 28% of farmers had full access to irrigation water, then in 2022 (and this is the year after the dry season of 2021), 53% of farmers from the project and 37% of farms have access from adjacent areas. Thus, one can see an almost two-fold increase in the availability of irrigation water in the 2022 agricultural season over a five-year period. Irrigation and drainage services (support/improvement) were provided to 34,767 WUA members in 31 target WUAs under the Project.

25. According to the impact assessment results, about 39% of farmers from the project WUAs were directly involved (in works, discussions, planning, etc.) in the first component of the APNIP, which resulted in irrigation water available in the required quantity and frequency for 80% of the farmers in the project WUAs, while that 91% of all farmers confirm improved water supply. Thus, taking into account the total number of Project beneficiaries in the part of Component 1 (improvement of drainage and irrigation infrastructure), considering the sampling error (n=304) at the level of +/- 5.6%, it can be assumed that the overall level of impact coverage of the project ranged from 85 % to 96.2%, i.e., from 29,551 to 31,499 water users/farmers out of a total of 34,767 people.

26. Number of water users with access to improved irrigation and drainage services are women. For women, it was proposed to change the summary targets and revise the final target downwards, as only heads of households are considered water users, and there are few female-headed households in the country.

27. To assess the impact of the Project on women, the total number of farms headed by women is needed. This information was not available in exact quantities at the time of the final evaluation. In addition, most agricultural households are headed by men. As a result, it is not possible to estimate the number of women with improved access to drainage irrigation services. However, it is possible to estimate the coverage rate expressed as a percentage. First, it is worth noting that out of the total number of farms that participated in the final assessment of Component 1 (N=1088), only 8.8% (N=96) were headed by women. Among them, 20.6% of women confirmed



their personal participation in the activities of Component 1 of the APNIP, another 79.2% believe that the availability of irrigation water has improved during the Project and 88.5% believe that.

28. According to the quantitative study, it was revealed that during the impact period of the Project (2018-2022), approximately 10% more women aged 15 to 49 began to use 5 or more of the 9 products. This indicates an increase in the diversity and quality of food in households. So, in the final study, 78% of respondents in both the project and adjacent areas confirmed a varied diet. At the same time, in the project areas, the level reached 84.4%. It should be noted that this indicator is 11% higher than in the baseline. The target was an increase in value of 11.4% and thus the project almost achieved the expected results.

29. An independent final assessment of the impact of the Project showed that WUA members received 18% more water in any period of time. In the baseline estimate, only 28% percent received water at any time to irrigate their plot, and in the final estimate, the share was 45%. This directly proves the improvement of the irrigation water supply system in the villages, as irrigation water for WUA farmers has become much more accessible. Thus, it can be concluded that the supply of irrigation water to farmers has been improved due to the project activities of the APNIP. This is evidenced by the indicator of the actual receipt of water by the farmers themselves. In the final estimate, it grew by 17%.

30. The area of land covered by irrigation and drainage services (ha) and the area of land covered by improved irrigation and drainage services (ha) as a result of the Project implementation amounted to 64,632 ha. According to the final assessment, farmers reported that, on average, 65.3% of all their irrigated fields and plots had improved water supply over the past three years (i.e., water supply was on schedule, water volume increased, water supply infrastructure improved, etc.). Starting in 2018, smaller land plots have been prioritized over larger land plots. The reason for this was the Project's interventions focused on supporting less protected small farms. Despite the fact that there is not enough water for everyone, the availability of water resources does not cause difficulties.

31. Proportion of WUA members for which there is evidence that they are implementing improved agronomic cropping practices (percentage). According to the PIU reports, as of December 31, 2021, this figure was 76%, and as of December 31, 2022, 81% of farmers apply knowledge of agricultural technologies in practice. This indicator is within the planned value, which is confirmed by both the internal monitoring reports of the PIU and the external independent final assessment.

32. Based on the results of the PIU reports and calculations, since the beginning of the Project, the total number of farmers who received seeds and mineral fertilizers is 20,633 people, or 265% of the target or 79% of the total number of farmers in the project WUAs. The project allocated seeds and fertilizers for 2021–2022 to 20,663 WUA members (of which 15,060 WUA member farmers have officially signed contracts, and 5,603 are adult family members who share seeds and fertilizers). In addition, 1,390 people of them received again i.e., re-listed and calculated as a double count. The double counting is because in 2021 the Project purchased and distributed mineral fertilizers, while for objective reasons, the purchase of seeds was not carried out, therefore, in 2022, these same people received seeds. The total sown area with the support of APNIP is 17,227 ha. Such a big difference occurred as a result of the restructuring of the Project, it was decided to purchase seeds and mineral fertilizers. In addition, the savings from the project were directed to additional purchases of seeds and mineral fertilizers, which were planned to be distributed to more than 10,000 farmers for sowing on more than 8,000 hectares of land.



33. As a result of the Project, 30 agricultural development plans were developed and approved in the target WUAs.

34. Number of client-days spent on trainings (total/women). For all beneficiaries (men and women) - completed ahead of schedule. The final target value of man-days has been reached and exceeded.

Component 2 and SHG: 136,695 client days

Component 3: 13,513 client days

Total: 150,208 client days

35. Seminars were also completed for the head teachers of secondary schools in 7 regions for further continuous dissemination of information among adolescent girls about good nutrition and anemia prevention with the participation of 237 people. Trainings on nutrition, prevention of coronavirus infection, growing and storing vegetables were held in 7 regions, where 373 people participated.

36. For women - also ahead of schedule. The final target value (96,938) has been reached and exceeded.

Component 2 and SHG: 84,116 client days

Component 3: 12,822 client days

Total: 96,939 client days

37. Such an excess of the final indicators occurred because the 4th stream was additionally mobilized at the expense of the saved funds, i.e., 2100 members of the SHG and, accordingly, a number of trainings were carried out for them. Also, due to the consulting services of individual consultants in each WUA, it was possible to reach a larger number of participants than previously planned.

38. According to the PIU, 47 appeals were received at the beginning of the project, they were considered and resolved (100%). Also, 10 complaints were registered in the GRM system, which were considered and resolved (100%).

39. Share of targeted beneficiaries participating in campaigns to improve household nutrition (%). According to the PIU, the situation with this indicator was achieved ahead of schedule. From PIU reports - completed in 2021 and exceeded final target value

Women of reproductive age - 190,091 people

Adolescent girls - 57,123 people

Children under 5 years old - 108,431 people.

40. A total of 355,645 people, which is 130.5% of the total number of target beneficiaries (272,517 people). According to the approved plan, 272,517 people were to be informed within the framework of the APNIP, and the actual coverage is 355,645 people, that is, it exceeds the target value by 30%. The excess was due to an increase in the population during the information period from 2018 to 2022. in 60 AAs where they actually live - 391,210 people. In order to inform the public and stakeholders about the activities of the World Bank projects under the Water Resources Service and ongoing project activities, a page on social networks on Facebook was created <https://www.facebook.com/NWRMP.APNIP> and the website launched <https://apnip.water.gov.kg>, where the activities of the Project were covered on a permanent basis, all reports and information materials of the Project were published. An interactive platform has been launched, which reflects complete information on all components of the project and the activities carried out in the targeted 31 WUAs.



41. During the visit to the SHG, a survey was conducted to improve the nutritional status, all the participants of the SHG confirmed that during their participation in the training they learned to pay more attention to the quality of food products, growth and buy only high-quality products for their own consumption, pay more attention to labelling, expiration dates etc. They also learned how to properly preserve and store food, freeze, dry food so as not to lose valuable nutrients. According to a survey conducted by the PIU of SHG participants from project WUAs, among all those participating in activities to improve the quality of nutrition and introduce new methods of storing products (and processing), 83% implement certain learned skills in practice in their families. According to the final assessment of the Project, in the control group (adjacent WUAs), this figure is almost two times lower and amounts to 35%. In general, in the project and adjacent WUAs, more than half of the WUG participants (52%) used methods to improve the quality and diversity of their food and their household members in their daily life practice.

42. In addition to the activities to achieve the main and additional indicators, within the framework of Component 3.4 of the APNIP, a number of activities were implemented aimed at strengthening the capacity of government bodies, the civil and business sectors and ensuring the institutional sustainability of food security and nutrition programs. Activities in this area can be divided into four main blocks:

- (a) Monitoring the implementation and analysis of the implementation of the Food Security and Nutrition Program in the Kyrgyz Republic for 2015-2017.
- (b) Technical assistance and expert support for the development, discussion, approval of the approval and implementation of the Food Security and Nutrition Program in the Kyrgyz Republic for 2019-2023, including the Comprehensive Plan and Operational Guidelines for implementation.
- (c) Organization and holding of events aimed at expanding international cooperation, exchange of experience and knowledge on food security and nutrition.
- (d) Carrying out a campaign to inform the population on ensuring food security and consulting and providing the Ministry of Agriculture with analytics and regular monitoring information on key issues of food security and nutrition.

43. 8 The project as a whole was implemented with good results, made a great contribution to the development of the regions, overcoming poverty, and will also assist in improving the health of the population and the gene pool in the future. In this way, the Project demonstrated its uniqueness, which had its impact on three different areas of activity: improvement of the infrastructure of irrigation systems in the project WUAs; development of agricultural productivity, which will subsequently increase the income of the population in the regions; capacity building of project beneficiaries; and public health information to prevent many diseases and help improve the gene pool of the population.

44. In general, under the APNIP, all the goals set were achieved. Namely: According to the final study, the share of farms with a land area of less than 0.6 hectares has increased almost 3 times since 2019: from 8.5% to 29.3%. Based on the results of the assessment, the increase in productivity was at the level of 65% for 47 types of agricultural crops compared to the level of the baseline assessment in 2018. From the results of comparison of the project and control WUAs of the final assessment, it can be concluded that the average yield of various crops in the project WUAs is in most cases higher than in adjacent WUAs. For example, the yields of alfalfa and sainfoin, spring wheat, watermelons, spring barley, corn, onions, table beets, peas, strawberries, and many others have increased significantly (from 10% to 200%).



45. Within the framework of the Project, problems with access to irrigation water were solved on the territory of 61 aiyl aimaks (AA), where Water Users Associations are located in 31 AAs. Irrigation and drainage systems were restored, including 31 adjacent AAs. Based on the results of the assessment, one can see significant changes in access to irrigation water by farmers in both the project and neighboring villages. So, if in 2018, as part of the baseline assessment, only 28% of farmers had full access to irrigation water, then in 2022 (and this is the year after the dry season of 2021), 53% of farmers from the project and 37% of farms have access from adjacent areas. Thus, one can see an almost two-fold increase in the availability of irrigation water in the 2022 agricultural season over a five-year period. Adjacent WUAs also benefited from the project because they got the opportunity to access water, being lower in the irrigation system, and more water also began to flow to them. In general, the availability of irrigation water has almost doubled over the past 5 years. Three quarters of farmers confirmed positive changes in access to irrigation water over the past 5 years. The list and scale of problems with irrigation, which are indicated by farmers, have been significantly reduced.

46. According to the results of the final assessment in the project WUAs, the level of work and commissioning of I&D facilities was 77.8%. According to the internal data of the PIU, as of May 31, 2023, 2022, rehabilitation work was completed in 31 WUAs.

47. The GAFSP Income Indicator (Tier1) of households also demonstrates significant changes for the better, which indicates the effectiveness of the Project. The value of the indicator for the baseline assessment is 58,805 KGS per farm, while in the final assessment it is already a multiple of KGS 244,408 (or 61,162 KGS and 282,165 KGS only for the project areas in the final and baseline assessments, respectively).

48. Under the Project, the beneficiaries also received material assistance in the form of various equipment. So, according to the study, 27% received a greenhouse for seedlings, 18% a greenhouse made of polyethylene, 9% a drip irrigation system, 4% a drying cabinet and much more. This equipment will significantly increase yields, improve nutrition, and optimize the work of farmers, which will further reduce human costs.

49. The survey conducted as part of the final evaluation also highlights the social significance of the Project. Thus, 73% of farmers felt useful thanks to the Project, 68% of the families improved their social status in the eyes of the residents of their village due to the Project, 64% learned to work together in groups, 43% began to cooperate more closely with residents of neighboring villages, 37% the group/foundation became involved in the management of the village and began to unite with other members of the SHG and began to perform joint participation in the work of the SHG, a third had fewer conflicts with other villagers on issues of irrigation and irrigation. Another fifth of the farmers, thanks to the income received because of participation in the Project, were able to send their children to study at a university.

50. Project WUAs have learned to carry out their activities independently. Many WUA representatives during the final assessment noted that thanks to the Project, they learned to work according to the correct methods. Moreover, representatives of medical institutions are confident that the training of the project will not go unnoticed and has long-term potential. Since having learned proper nutrition once, many will continue to follow the necessary diet, and medical workers, in turn, will control this process.

51. One of the tasks during the implementation of the Project, related to the implementation of the measures provided for in the environmental policy, was to increase the capacity of design engineers and technical supervisors of the PIU APNIP, as well as those responsible for environmental protection in contractor organizations in terms of the implementation of the EMP. Capacity building trainings were started immediately



after the selection of contractors. In total, during the implementation of the Project, trainings on environmental protection, labor protection and health were conducted. Annually, 2 trainings per year were held, as contractors were attracted for construction work.

52. In 2022 The PIU organized 2 trainings for WUA representatives, where the results and recommendations of the environmental sustainability of the rehabilitated facilities were presented. The training covered the following issues: the impact of the water sector on the environment; problems and challenges in the operation of the irrigation network; risks when water is supplied to irrigated fields in excess of irrigation norms for agricultural crops; the effect of fertilizers on the growth and development of plants; risks when using mineral fertilizers in violation of established standards; recommendations for the period of operation in order to prevent pollution of soil, surface water; recommendations for the timely cleaning of mudflow outlet structures.

53. In pursuance of the recommendations of the World Bank, presented in an aide-mémoire to the December 14-25, 2020, mission aide-mémoire, an environmental sustainability study of the commissioned properties was conducted. April 2021 The PIU has developed a methodology for assessing the environmental sustainability of the APNIP, which has been approved by the World Bank. As part of the Methodology, a checklist was developed for conducting an expert survey of environmental sustainability in the field. The study of the environmental sustainability of the commissioned facilities provides for issues related to the protection of land and water resources, as well as the technical condition of canals aimed at preventing leakage from the canal and the possibility of the canal: (1) waterlogging of soils, (2) soil erosion, (3) water quality and soil, (4) delivery of water to agricultural fields for irrigation, (5) introduction of water-saving technologies.

54. During the study, the PIU environmental specialist gave recommendations to the WUA on the operation of rehabilitated irrigation canals for the environmental sustainability of the commissioned facilities, explanatory work was carried out on the rational use of water and fertilizers.

55. In pursuance of the status of concerted actions presented by the World Bank based on the results of the mission from December 5-9, 2022, an analysis of the sustainability of the rehabilitated facilities was carried out. Considering the limited timeframe for the analysis and the winter period, during January-February 2023, associated with the impossibility of visiting the commissioned facilities, the analysis was carried out according to the yearbook "Monitoring, forecasting hazardous processes and phenomena on the territory of the Kyrgyz Republic", published by the Ministry of Emergency Situations of the Kyrgyz Republic. As a result of the analysis, it was found that for those facilities that are located in the village of the danger zone, the PIU APNIP designed fortifications and aqueducts for the transfer of irrigation water through the mudflow throughput facilities.

56. All rehabilitated structures, including canals, were designed taking into account the irrigation area served by them. In accordance with construction standards 2.06-3.85 "Reclamation systems and structures", all designed facilities belong to the 4th class.

57. Out of 31 subprojects, 9 subprojects have designed herrings, protective dams, and aqueducts to supply irrigation water through mudflows. Seleduks, bank protection dams and aqueducts are designed for a flow rate of 1% security, i.e., the maximum flow rate of the flood is 1 time in 100 years, which complies with the current requirements and standards. All constructed structures were put into operation by the state commission.

58. According to the World Bank's Operational Policy 4.01.1 on disclosure of information under the Project, public hearings on social and environmental issues were held in all 31 WUAs prior to the commencement of





rehabilitation works. All project stakeholders were informed in general about the possible impacts from project activities, potential temporary or permanent impacts on land use, access to it, buildings/structures and sources of income, mechanisms for providing compensation, as well as a grievance mechanism.

59. A social assessment was carried out on the impact of private land plots in 31 WUAs, in terms of land acquisition and involuntary resettlement in accordance with the World Bank Operational Policy 4.12 “Involuntary Resettlement”. In 29 WUAs, social screening of the expected impacts was carried out, according to the results of the social screening, the application of WB OP 4.12 procedures was not required, there were no impacts on involuntary resettlement.

60. For the 2 WUAs of the project, a comprehensive social audit of the rehabilitated WUA facilities was carried out for the impact of project activities on the land plots of private owners.

### **Lessons learned**

61. At the initial stage of the Project, social issues, in particular, involuntary resettlement, were not given sufficient attention by the PIU, as a result, social screening in some WUAs was carried out after the start of rehabilitation work, and in some at the completion of subprojects.

62. The design of the subprojects did not involve a social specialist, did not consider the requirements of the World Bank for involuntary resettlement, as a result, for some subprojects, the engineering teams had to redesign the canals due to land issues.

63. When designing, it is necessary to conduct preliminary discussions with a wide range of responsible and involved persons when selecting sites for the modernization of infrastructure facilities.

64. When designing canals, it is necessary to make maximum use of the old channel to avoid compensation payments to the population.

65. Taking into account the peculiarity of the rehabilitation of on-farm canals, it is necessary, if possible, to provide temporary bypass canals to pass irrigation water for irrigation during the growing season, including the cost of these works in the estimate. This led not only to a delay in construction work during the growing season, but also to a conflict between the State Ecological and Technical Inspectorate, the PIU and the contractor.

66. During construction, water users demand reinforcement of canals, even where there is no need for reinforcement, contractors and specialists often met the requirements of water users, which led to higher construction costs.

67. At the design stage, it is necessary to assess the building materials market, and the delivery distance. This is especially true when using parabolic trays, in this regard, the transition to monolithic concrete would be advisable.

68. It is necessary to include in the expense item the conduct of hydrogeological and geological surveys in accordance with the approved Construction norms and regulations and other necessary environmental measures: (1) felling of trees and shrubs, (2) removal and storage of the soil and vegetation layer, (3) dismantling and removal to a specially equipped sites for construction waste, (4) carrying out planning, restoration, and reclamation work.



69. According to regulations 20% of penalties for the unfulfilled part of the rehabilitation work can be charged from the contractor. In the case of termination of contracts, we collect a bank guarantee for the performance of the contract and advance payments. Contractors cannot pay the 20% fine. All this leads to conflict situations and litigation. In addition, the source of payment of legal costs is not provided in the PIU funding plan.

70. It is necessary to make appropriate changes to the terms of procurement, to exclude or minimize the adjustments to the awarded contracts, in order to eliminate the rise in the cost of the work provided. It is also necessary to include a section describing the mechanism for eliminating defects within the warranty period.

71. It is recommended to subsequently centralize procurement of grant WUAs and carry out similar procurement through the PIU, since a large volume of purchases gives the effect of saving on the price of the contract and speeds up the procurement process in terms of professional tendering.

72. More involvement of WUA members in I&D rehabilitation work, since only 25% of farmers were involved (directly or indirectly) in the work, which is almost half the level of involvement of beneficiaries in other substantive activities - agricultural advisory services and trainings with seminars. Only every tenth farmer received support from all project components at once.

73. The tool of social mobilization and the creation of self-help groups within the framework of the project showed high efficiency and the ability to respond flexibly to changing situations. In connection with the restructuring of the project in 2021, additional mobilization was carried out - the 4th stream of the SHG was created, despite the tight deadlines, however, the project managed to fully cover the activities and technical support, including the 4th stream of the SHG.

74. Despite success in changing the irrigation system, other problems remain quite significant and widespread, hindering the development of agriculture. The project carried out a number of activities to educate and inform farmers on issues such as: Crop diseases/Weeds and infections, Parasites/insects, rodents and birds, mechanization, and use of tools in agriculture. It should be noted that the Project did not aim to cover the entire population of the pilot WUAs with training and consultations. Therefore, despite the tangible effect in the target groups, it is necessary to continue to pay special attention to solving the above issues from the side of agricultural development projects. In addition to these, there are also problems that farmers have begun to meet more often and require special attention as part of the continuation of the work of the APNIP in the project and adjacent areas, these are: lack of available loans, lack of information about buyers / processors, lack of knowledge on irrigation and crop storage technologies. Also, farmers in Osh region more often began to declare problems with water supply and conflicts on this basis.

75. Conducting training activities should be more clearly concentrated in some regions and areas where the indicators of involvement and, as a result, productivity are not the highest (compared to other areas). Trainings on tillage and fertilization and soil analysis were the least requested among farmers, partly due to the complexity of these procedures, as only about 20% of farmers participated and only about half of them confirmed the practical applicability of the knowledge and information received in their fields.

76. Engineering company or individual design engineers to carry out detailed design in close cooperation with environmental specialists, taking into account the initial state of the environment:

- (a) groundwater levels and the presence of a collector-drainage network;
- (b) the presence of natural hazards in the area of the proposed facility being designed;



(c) water protection zones and strips.

77. Provide, if necessary, the construction of temporary bypass channels for the growing season and their reclamation upon completion of construction work.

78. Water Users Association, farmers, state organizations authorized in the field of water management:

- Do not allow water to be supplied to canals in excess of the established capacity of the canal, especially in those WUAs that have their own water intake from a natural source.
- Carry out explanatory work with the population about a thrifty attitude to the constructed facilities: do not litter the canals and carry out timely cleaning to prevent silting.
- Constantly conduct educational and information activities on the norms of applying mineral fertilizers and compliance with environmental safety standards
- Constantly carry out explanatory work among farmers about the rational use of water and the introduction of water-saving technologies.

79. Involve a social specialist at the initial stage of the Project launch, as well as work closely with the engineering team with the social specialist, in particular in the design of irrigation systems, conduct activities to increase the knowledge of World Bank safeguard engineers and ensure that engineers participate in training on safeguard measures WB.



ANNEX 7. PDO AND IRI AT APPRAISAL AND RESTRUCTURING

PAD Indicators	Baseline	End Target	Revised Indicators at Restructuring			Explanation
<b>PDO</b>						
Average % increase in crop <b>production</b> for WUAs (with completed I&D and advisory services);	0	10	Average % increase in crop <b>productivity</b> for WUAs (receiving full package of improved irrigation, seeds, fertilizers or other goods, and training.)	0	10	<b>Production</b> could be a result of cropping patterns, yields, or price changes, and was replaced with <b>Productivity</b> . It was clarified that it should be assessed for WUA members receiving full package.
Water users provided with <b>new/improved</b> I&D services	0	36,600	Water users provided with improved I&D services	0	26,000	“New” was removed because the APNIP worked only with existing WUAs. End target revised to reflect the number of WUA members benefitting rather than all the WUA members.
Water users provided with irrigation and drainage services – female	0	7,200	No change	0	2,600	End target revised down as only heads of households are counted as water users, and female-headed households are typically 10% or less.
Proportion of households with food consumption score (FCS) above 28.5 points	–	40%	Women 15-49 years of age who consumed at least 5 of 9 food groups	67.3	75	98% of households already had a score of 35 points and thus the original target had already been met.
<b>Intermediate results</b>						
Number of WUAs providing improved water delivery that closely matches crop irrigation water requirements	0	30	Number of WUAs providing irrigation water delivery in line with agreed irrigation schedule	0	30	Indicator simplified as the original indicator assumed that irrigation water requirements are known by farmers and WUAs.
Area provided with irrigation and drainage services (ha)	0	60,000	No change	0	60,000	
Area provided with irrigation and drainage services - Improved (ha)	0	60,000	No change	0	60,000	
Operational water user associations <b>created and/or</b> strengthened	0	30	Operational water user associations strengthened	0	30	“created” was removed because the project worked only with existing WUAs.

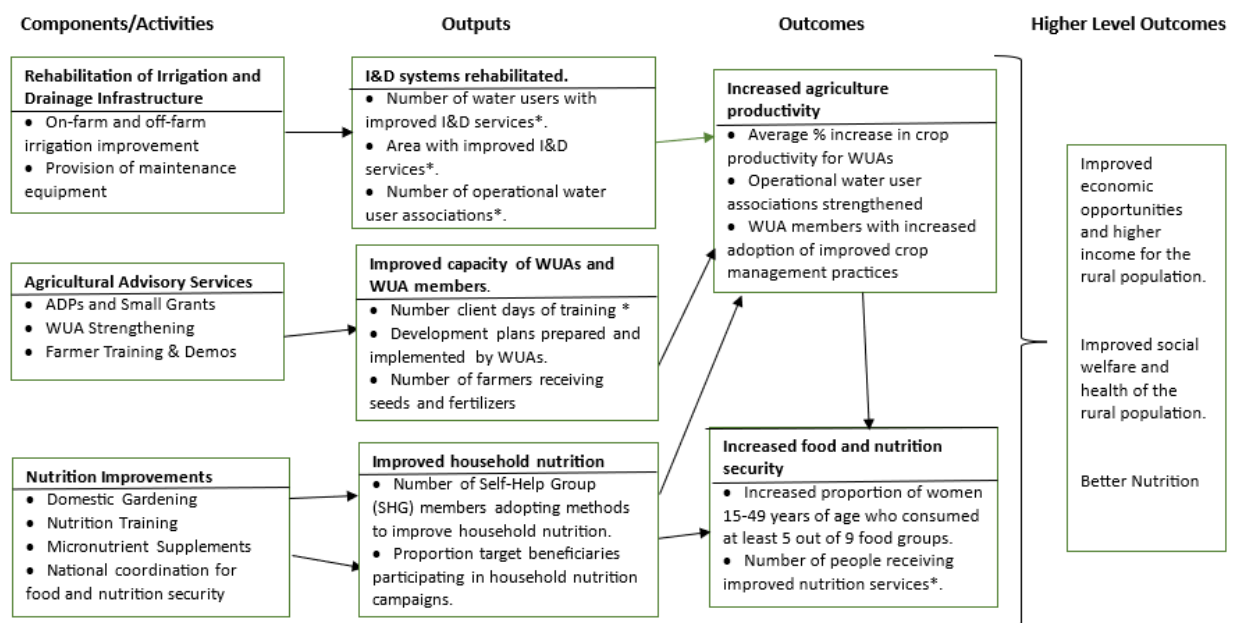


PAD Indicators	Baseline	End Target	Revised Indicators at Restructuring			Explanation
Number of successfully rehabilitated systems	0	30	No change	0	30	
Number of development plans prepared and being implemented by WUAs	0	30	No change	0	30	
Proportion of WUA members with evidence of increased adoption of improved crop management practices	0	80	No change	0	80	
Number of farmers receiving seeds and fertilizers (Number)	--	--	Added		7,800	Additional activity. Note that some farmers already received seeds and fertilizers through small grants.
Client days of training provided (number)	0	7,200	Modified	0	96,900	End target revised to reflect large numbers participating in nutrition training
Client days of training provided - Female (number)	0	3,600	Modified	0	79,560	End target revised to reflect large numbers of women participating in nutrition training
Proportion of target beneficiary participating in household nutrition campaigns (Percentage)	0	80	No change	0	80	
Proportion of households participating in component 3.2	0	80	Removed			Subcomponent 3.2 dropped
Proportion of households adopting methods to improve household nutrition	0	80	Number of SHG members adopting methods to improve household nutrition	0	9,000	Revised to align with the description and to change to a more readily measurable indicator, with a realistic end value of 9,000
Grievances registered related to delivery of project benefits addressed (%)	0	100	No change	0	100	
Grievances related to delivery of project benefits that are addressed-(number)	0	6	Removed			Dropped due to duplication



### ANNEX 8. THEORY OF CHANGE

Figure 1: Theory of Change (Results Chain)



**Critical Assumptions:** 1) Improved irrigation coupled with agricultural advisory services would lead to increased agricultural productivity and thus higher incomes and improved food and nutrition security; 2) Local contractors would have sufficient capacity to carry out rehabilitation works; 3) Preparation of ADPs and small grants for agricultural inputs and machinery, plus training, would strengthen capacity of WUAs to provide services; 4) Formation of self-help groups along with training would increase production of nutritious vegetables and thus better nutrition; 5) Nutrition training and coordination would lead to better nutrition.

\* The GAFSP core indicators were<sup>1</sup>: 1) Number of client days of training to raise agricultural productivity provided to scientists, extension agents, agro-dealers, farmers, community members etc (disaggregated by gender). 2) Area with improved/rehabilitated irrigation and drainage services (ha). 3) Number of water users provided with new/improved/rehabilitated irrigation and drainage services (disaggregated by gender). 4) Number of operational water user associations. 5) Number of people receiving improved nutrition services (e.g., Ready to Use Therapeutic Food (RUTFs), Vitamin A, micronutrients, bio-fortified foods), disaggregated by gender, age, vulnerable groups.



## ANNEX 9. WUAs REHABILITATED DURING PROJECT

1. **Rehabilitation of I&D infrastructure.** Over the project, 336 km of irrigation canals (including concrete lining where needed), 110 gauging stations, and 2,795 other key hydraulic structures were installed and/or rehabilitated in 31 WUAs at a cost of US\$19.54 million. The total number of WUA members was 34,467, covering a WUA area of 64,632 ha. The irrigation works for the 31 WUAs are summarized in Table 9.1.

Table 9.1. Summary of Irrigation Works for 31 WUAs

No.	Region	District	WUA	Area (ha)	Length (km)	Gauging stations (no.)	Other structures (no.)	Beneficiaries (no.)	Cost (US\$)	Date Completed
1	Batken	Kadamjay	Gauyan	2,502	13.87	4	39	1,391	749,127	26-Jun-20
2		Kadamjay	Tilla-suu	1,851	7.78	2	29	1,363	493,470	17-Jun-22
3		Leylek	Kyrk-bulak	1,072	2.74	1	50	6,54	432,853	01-Dec-22
4	Jalalabad	Ala-Buka	Sulaiman-suu	2,442	12.15	11	85	422	706,371	23-Oct-19
5		Nooken	Taimonku	1,317	8.86	0	41	1,501	688,221	24-Dec-19
6		Bazar-Korgon	Obi-khaet	1,308	7.44	3	61	1,197	382,599	29-Nov-21
7		Nooken	Ak-jol-suu	2,239	9.03	3	51	1,764	619,847	05-Apr-22
8	Issyk-Kul	Jety-Oguz	Belsovkoz-o	5,275	32.48	15	326	1,318	1,794,165	17-May-21
9		Jety-Oguz	Sary-tor	2,023	7.65	3	100	436	589,160	11-Nov-22
10		Ak-Suu	Tasma-karanar	1,918	14.9	2	173	436	736,718	23-May-23
11	Naryn	Jungal	Toktomush	1,722	3.57	0	62	980	378,340	02-Feb-21
12		Ak-Talaa	Talaa-bulak	1,025	11.29	1	81	821	329,804	24-May-22
13		Naryn	Ak-marcha	1,180	3.68	0	29	633	466,441	28-Jun-22
14		Kochkor	Kara-kurgoi-ukok-suu	2,459	19.28	0	116	702	675,084	15-Sep-22
15		At-Bashy	Bash-keltebek	2,389	8.9	2	22	500	859,585	15-May-23
16	Talas	Manas	Bereke-s	1,161	3.6	3	27	380	306,123	10-Dec-18
17		Kara-Buura	Mol-bulak	1,967	17.15	6	46	458	464,311	30-Dec-21
18	Osh	Aravan	Kur-tash	2,654	18.07	5	128	742	712,426	28-Jun-20
19		Uzgen	Kurshab-arzybek	1,516	4.7	1	66	2,127	487,780	31-Mar-21
20		Nookat	Khoja-aryk	1,832	5.1	0	46	4,871	490,396	25-Aug-22
21		Kara-Kulja	Ten-alysh	1,560	5.69	1	42	1,062	475,731	01-Dec-22
22		Nookat	Kyzyl-boston	1,056	0.97	1	16	1,880	370,341	30-Nov-22
23		Kara-Suu	Abror	3,202	14.2	11	137	4,294	870,202	30-Nov-22
24		Kara-Suu	Ene-sai	1,281	7.54	10	47	835	320,112	25-Apr-23
25		Aravan	Sokhil	1,310	4.7	3	67	1,811	502,235	22-May-23
26	Chui	Moskva	SKM	5,430	18.53	10	207	297	1,025,056	28-Oct-21
27		Kemin	Umetaly	2,175	11.54	3	215	640	586,181	30-Apr-22
28		Ysyk-Ata	Jany-tilek	2,497	14.53	2	121	640	716,262	10-Jun-22
29		Ysyk-Ata	Oi-talgy	2,482	20.42	2	162	345	963,847	01-Aug-22
30		Jaiyl	SHAB	2,527	17.44	4	101	65	927,577	09-Nov-22
31		Sokuluk	Aliya-orositel	1,260	8.14	1	102	202	419,894	30-Nov-22
	<b>Total</b>			<b>64,632</b>	<b>335.94</b>	<b>110</b>	<b>2,795</b>	<b>34,767</b>	<b>19,540,259</b>	

Source: PIU.



2. The total number of workers employed by the construction companies during the rehabilitation of the 31 WUAs was 1,032. The coefficient of water use, which gives an estimate of water losses during irrigation, increased from an average of 56 percent to 76 percent after the rehabilitation works (table 9.2).

**Table 9.2. Number of Workers and Coefficient of Water Use before and after Rehabilitation for 31 WUAs**

	WUA	Rayon	Contractor	Number of Workers	Coefficient of Water Use	
					Before	After
<b>A. North Region</b>						
1	Bereke-S	Manas	Talaskurulush JSC	42	0.65	0.74
2	Toktomush	Jungal	Narktoo LLC	34	0.50	0.71
3	Belsovkhodz-O	Jety-Oguz	Impuls-Osh LLC	58	0.56	0.80
4	SKM	Moskva	Omegastroy LLC	46	0.56	0.75
5	Mol-Bulak	Kara-Buura	Pobeda LLC	28	0.60	0.76
6	Umetaly	Kemin	Ustroycomp LLC & Ekaras-5 LLC	35	0.56	0.75
7	Jany-Tilek	Ysyk-Ata	LOI LLC	29	0.56	0.75
8	Talaa-Bulak	Ak-Talaa	PP Minur LLC	26	0.45	0.75
9	Ak-Marcha	Naryn	Profit-Express LLC	14	0.30	0.77
10	Oi-Talgy Lot-1	Ysyk-Ata	Pobeda LLC	36	0.56	0.76
11	Oi-Talgy Lot-2		Ekaras-5 LLC & PP Minur LLC	32	0.56	0.76
12	Kara-Kungoy Ukok-Suu	Kochkor	Jalal-Abad SMUTT JSC	40	0.45	0.72
13	Sary-Tor	Jety-Oguz	Tunuk-Kur LLC & Bay-Shagyl LLC	35	0.60	0.75
14	Aliya-Orositel	Sokuluk	PP Minur LLC	28	0.56	0.77
15	SHAB	Jayil	Profit-Express LLC	60	0.56	0.75
16	Tasma-Karanar	Ak-Suu	Avtotransstroy LLC	10	Terminated	
17			Pobeda LLC	14	0.60	0.80
18	Bash-Keltebek	At-Bashy	OsOO Hi Tech Story	20	Terminated	
19	Bash-Keltebek Lot-1		Jalal-Abad SMUTT JSC	33	0.50	0.70
20	Bash-Keltebek Lot-2		OcOO "Экаpac-5"	13	0.50	0.70
21	Bash-Keltebek Lot-3		Ustroycomp LLC & Ekaras-5 LLC	11	0.50	0.70
<b>Sub-total (North)</b>				<b>644</b>		
<b>B. South Region</b>						
1	Kur-Tash	Aravan	Injenernaya Zashita LLC	22	0.64	0.8
2	Gauyan	Kadamjay	HydroTehStroy LLC	27	0.62	0.75
3	Taimonku	Nooken	Masyayilkurulush JSC	19	0.56	0.8
4	Sulaiman-Suu	Ala-Buka	Masyayilkurulush JSC	21	0.58	0.8
9	Kurshab-Arzybek	Uzgen	Brik LLC	25	0.56	0.75
10	Obi-Khaet	Bazar-Korgon	Kelechek JSC	26	0.56	0.75
11	Ak-Jol-Suu	Nooken	Masyayilkurulush JSC	21	0.60	0.80
12	Kyrk-Bulak	Leylek	SKF Kuruuchu LLC	18	0.65	0.8
13	Ten-Alysh	Kara-Kulja	Brik LLC	18	0.6	0.75
14	Khoja-Aryk	Nookat	SKF Kuruuchu LLC	24	0.56	0.8
15	Tilla-Suu	Kadamjay	Injenernaya Zashita LLC	21	0.62	0.8
16	Ene-Sai	Kara-Suu	Tunuk-Kurulush LLC	19	0.6	0.75
17	Kyzyl-Boston	Nookat	Injenernaya Zashita LLC	18	0.6	0.75
18	Abror Lot-1	Kara-Suu	HydroTehStroy LLC	17	0.56	0.75
19	Abror Lot-2		Masyayilkurulush JSC	19		





	WUA	Rayon	Contractor	Number of Workers	Coefficient of Water Use	
					Before	After
20	Abror Lot-3	Aravan	HydroTehStroy LLC	17	0.60	0.80
21	Sokhil Lot-1		Injenernaya Zashita LLC	20		
22	Sokhil Lot-2-1		SKF Kuruuchu LLC	19		
	Sokhil Lot-2-2		Masyayilkurulush JSC	17		
	<b>Subtotal (South)</b>			<b>388</b>		
	<b>Total 31 WUAs:</b>			<b>1,032</b>		

Source: PIU.

3. Partial rehabilitation of seven off-farm canals managed by six district irrigation departments (*Rayvodkhoz*) was also completed as planned at a cost of US\$791,257. Works included mechanized cleaning of 14.3 km of drains and 0.19 km of subsurface drainage, rehabilitation of 32 gauging stations and construction of 14 new gauging stations and installation of the necessary instrumentation at each site, and construction of 26 other hydraulic structures to improve delivery of water to selected WUAs. A summary of the off-farm work is shown in table 9.3.

**Table 9.3. Rehabilitation of Off-Farm Canals**

Off-Farm Canal	Oblast	Gauging Stations		Mechanized Cleaning (km)	Other Hydraulic Structures	Cost US\$
		Rehabilitated	New			
Bolshoy Talas	Talas	2		6.8	5	129,528
Sovkozniy	Chui	4	6	3.1	2	88,628
Komsomolskiy	Issyk-Kul	9	8	4.4	12	130,337
Aravan - Ak-Buura	Osh	7			1	127,205
Levaya Magistral Kugart	Jalalabad	3			5	85,862
Kojo-Kaiyr	Batken	7				100,169
Shakaftar	Jalalabad				1	129,528
<b>Total</b>		<b>32</b>	<b>14</b>	<b>14.3</b>	<b>26</b>	<b>791,257</b>

Source: PIU.

4. The project also carried out rehabilitation work at a cost of US\$1.097 million for seven on-farm systems that had not been completed under the additional financing for OIP-2. The WUAs were Jany-Aryk-SA, Jalalabad; Myrza-Suu, Jalalabad; Taldy-bulak, Talas; Ak-Bulak-Suu, Chui; Kashka-Suu 4878, Issyk-Kul; Alagoz-Kaba L No 1 Issyk-Kul; and Alagoz-Kaba L No 2, Issyk-Kul. Under the APNIP, 31.98 km of canals were rehabilitated and 15 gauging stations and 238 various hydraulic structures on the canals were constructed, resulting in improved water supply for 13,861 ha. These WUAs are not included in the outcomes and analysis of benefits from Component 1.



**ANNEX 10. SMALL GRANTS AND REVOLVING FUNDS**

1. Each of the 30 WUAs received a grant of US\$30,000 plus a cash contribution from the WUA of 10 percent (US\$3,000). Of the total, 10 percent was required to be spent on contracting local advisory service providers to provide training and consulting for the WUA members, mostly on improved agricultural technologies. The remainder could be spent on the WUA priorities as set out in the WUA ADPs.
2. The small grants were used to purchase seeds and fertilizers for distribution to the WUA members. Each WUA established a revolving fund with beneficiary farmers required to repay the value of the inputs received after harvest to the WUA for future purchases of seeds and other inputs. Around 41 tons of seeds and 600 tons of fertilizers were provided through the ADPs. After the March 2020 project restructuring and use of further cost savings, additional high-quality certified seeds (808.5 t wheat, 1,039.5 t barley and 56.6 t maize) and 6,729 t of fertilizers were then purchased and distributed to 20,663 farmers to address food security needs and to increase productivity. The actual terms for repayment into the revolving fund are determined by the WUA management and approved by the WUA General Assembly of members, with guidelines included in the Operational Manual for ADPs prepared at the outset of the project.
3. The small grants were also used to purchase small agricultural machinery (including tractors, planters, cultivation equipment [ploughs, discs, cultivators, and land levelers], harvesting machinery, hay-making equipment, seed cleaners, and other small items) for use by the WUA members. Use of this equipment contributes to more timely field operations and leads to improved land preparation, more precise planting and thus improved seed germination, reduced losses from weeds, and fewer losses during harvesting. Around 2,704 WUA members benefited from the use of agricultural machinery in 2022 covering 10,530 ha. Further project savings allowed the purchase and delivery of additional grain planters for 31 WUAs (that is, covering one more WUA than the initially planned 30 target WUAs) and then 30 hp mini-tractors and attachments for 30 target WUAs by project closure. Each WUA contracted an operator to operate and maintain the equipment, with payments made by farmers for their use at a standard market rate. The proceeds were then normally divided into costs for the operator, returns to the WUA for their use, and depreciation, with typically around one-third for each category. During the ICR mission, it was noted that some WUAs had already started, or had plans, to use funds for additional infrastructure improvements and machinery purchases. The actual level of charges for machinery use are determined by the WUA management and approved by the WUA General Assembly of members, with guidelines included in the Operational Manual for ADPs.
4. The value of the revolving funds was KGS 259 million at the time of the ICR mission in June 2023—KGS 96.6 million deposited in local bank accounts and KGS 162.4 million held by farmers (mostly as seeds and fertilizers). The WUAs have used the funds to purchase seeds and planting material, fertilizer, and, in some cases, additional agricultural machinery and equipment as shown in Table 10.1, with decisions agreed by the General Assembly as above.

**Table 10.1. Value and Use of Revolving Fund for 30 WUAs, April 30, 2023**

	WUA	District	Revolving Fund, KGS			Procured by WUAs for 2022–2023
			Total Amount	Deposited in Bank	In the Hands of Farmers	
<b>North Region</b>						
1	Umetaly	Kemin	12,620,000	3,486,700	9,133,300	Barley (14 t - KGS 490,000)



	WUA	District	Revolving Fund, KGS			
2	Aliya-Orositel	Sokuluk	2,766,150	1,537,400	1,228,750	Seeds of vegetable and industrial crops, plastic for greenhouses (KGS 1,100,000)
3	SHAB	Jayl	11,452,900	2,623,620	8,829,280	
4	Zhany-Tilek	Issyk-Ata	17,019,104	7,322,129	9,696,975	
5	SHM	Moskva	6,100,000	700,000	5,400,000	Ammophos (28.4 t - KGS 1,350,000), saltpeter (28 t - KGS 1,250,000), alfalfa (1 t - KGS 350,000), corn (3.65 t - KGS 2,450,000)
6	Bereke S	Manas	8,900,810	2,500,000	6,400,810	Ammophos (KGS 2,508,000)
7	Mol-Bulak	Kara-Buura	6,730,908	2,254,272	4,476,636	Wheat (23.8 t - KGS 830,000), alfalfa (6.3 t - KGS 2,079,000)
8	Tasma Karanar	Ak-Suu	7,867,300	5,099,885	2,767,415	
9	Bel-Sovkhoz	Jeti-Oguz	9,112,100	832,100	8,280,000	Ammophos (KGS 840,000), Diammophos (KGS 520,000), Barley (KGS 1,200,000), Sainfoin (KGS 1,200,000)
10	Sary Tor	Jeti-Oguz	3,400,000	1,360,000	2,040,000	Seedlings (KGS 1,200,000), potato digger (KGS 220,000), seeder (KGS 160,000), disc (KGS 400,000), potatoes (KGS 270,000), barley (25 t), wheat (30t)
11	Toktomush	Jumgal	7,764,677	1,240,000	6,524,677	Blackcurrant seedlings and barbed wire for a fence (KGS 500,000)
12	Talaa Bulak	Ak-Talaa	6,504,267	4,136,618	2,367,649	
13	Kara-Kungoy-Ukok-Suu	Kochkor	10,406,140	2,092,000	8,314,140	Wheat (38.6 t - KGS 1,737,000), barley (37 t - KGS 864,000), sainfoin (3 t - KGS 195,000), fuel and lubricants (3 t - KGS 195,000)
14	Ak-Marcha	Naryn	7,864,522	585,000	7,279,522	Sainfoin (4 t - KGS 460,000), wheat (21.28 t - KGS 638,400), barley (39.79 t - KGS 1,193,700), sainfoin (3 t - KGS 210,000), alfalfa (0.5 t - KGS 145,000), potatoes (5 t - KGS 125,000), potatoes (1 t - KGS 135,000)
15	Bash-Keltebek	At-Bashy	3,135,000	1,470,578	1,664,422	Barley (KGS 605,602), mineral fertilizer (KGS 350,000)
	<b>Total (North)</b>		<b>121,643,878</b>	<b>37,240,302</b>	<b>84,403,576</b>	
<b>South Region</b>						
1	Gauyan	Kadamjay	15,454,575	3,300,540	12,154,035	Wheat (42 t - KGS 1,500,000), Barley (KGS 800,000)
2	Tilla Suu	Kadamjay	6,637,246	2,345,000	4,292,246	



	WUA	District	Revolving Fund, KGS			
3	Kyrk-Bulak	Leilek	8,291,227	2,977,950	5,313,277	Urea (20 t - KGS 640,000), Saltpeter (10 t - KGS 460,000)
4	Sulaiman Suu	Ala-Buka	11,063,196	6,506,586	4,556,610	Ammophos (85 t - KGS 4,845,000).
5	Obi-Khaet	Bazar-Korgon	8,343,428	5,410,000	2,933,428	Cotton seed (12 t), Urea (80 t)
6	Taimonku	Nooken	11,159,545	5,820,300	5,339,245	Ammonium nitrate (50 t - KGS 1,600,000), Urea (50 t - KGS 2,100,000 KGS), Urea (15 t - KGS 660,000). Cotton seed (2.475 t - KGS 940,500)
7	Ak-Jol-Suu	Nooken	10,228,006	8,200,000	2,028,006	150,000 kg of Ammonium nitrate (150 t - KGS 5,400,000), Ammonium nitrate (50 t - KGS 1,400,000)
8	Ten Alysh	Kara-Kulja	9,482,250	5,850,000	3,632,250	Ammophos (83.85 t - KGS 4,250,850), mineral fertilizer (KGS 1,680,000)
9	Kur-Tash	Aravan	6,642,500	1,500,000	5,142,500	The WUA plans to purchase an Excavator.
10	Ene-Sai-South	Kara-Suu	5,620,144	1,770,144	3,850,000	Ammophos (10.5 t - KGS 588,000, Barley (12.06 t - KGS 422,100), Baler (KGS 480,000), Reversible plow (KGS 220,000), Land leveller (KGS 40,000)
11	Abror	Kara-Suu	10,041,296	1,842,000	8,199,296	
12	Khoja-Aryk	Nookat	15,979,873	4,017,527	11,962,346	Ammophos (30 t - KGS 1,830,000), Alfalfa (1 t - KGS 600,000)
13	Kyzyl-Boston	Nookat	6,554,461	3,591,720	2,962,741	Container for storing fertilizer (KGS 160,000), Urea (40 t - KGS 1,520,000), Ammonium nitrate (20 t - KGS 650,000), Alfalfa (1 t - KGS 650,000)
14	Kurshab Arzybek	Uzgen	6,114,132	3,458,000	2,656,132	Winter wheat (30 t - KGS 1,650,000)
15	Sokhil	Aravan	5,789,200	2,800,000	2,989,200	
	<b>Total (South)</b>		<b>137,401,079</b>	<b>59,389,767</b>	<b>78,011,312</b>	
	<b>Total</b>		<b>259,044,957</b>	<b>96,630,069</b>	<b>162,414,888</b>	

Source: PIU.

5. The agricultural machinery purchased using the small grants also enabled the WUA to provide additional services to their members and generated funds for WUA use. In 2022, about KGS 2.7 million was available from machinery services for WUA use and depreciation with services provided for 2,798 WUA farmers. WUAs in the north tended to select machinery using their small grants to a greater degree than in the south including eight WUAs that did not select machinery. The types of equipment and use are shown in Table 10.2.



Table 10.2. Services Rendered with the Equipment by WUAs, 2022

	WUA	Equipment	Income	Expenses	Profit	Hectares	Number of Farmers
<b>North Region</b>							
1	Aliya Orositel	Plow	20,950	10,475	10,475	104	36
		Disk harrow	5,700	2,850	2,850	28.5	6
		Chisel cultivator	18,450	9,225	9,225	92.25	32
		Field sprayer	15,150	7,575	7,575	75.75	28
	<b>Sub-Total</b>		<b>60,250</b>	<b>30,125</b>	<b>30,125</b>	<b>300.5</b>	<b>102</b>
2	Bash-Keltebek	Field sprayer	32,300	16,450	15,850	161.5	32
		Cart	5,100	2,570	2,530	25.5	5
		Plow	25,210	15,670	9,620	126.05	25
	<b>Total</b>		<b>62,610</b>	<b>34,690</b>	<b>28,000</b>	<b>313.05</b>	<b>63</b>
3	Umetaly	Excavator	33,600	10,000	23,600	168	34
		Sprayer	20,000	—	20,000	100	20
		Seeder	40,000	—	40,000	200	40
	<b>Total</b>		<b>93,600</b>	<b>10,000</b>	<b>83,600</b>	<b>468</b>	<b>94</b>
4	Bereke-S	Sprayer	53,500	25,774	27,726	267.5	54
		Rototiller	77,200	44,000	33,220	386	77
		Baler	179,088	119,188	59,900	895.44	179
		Cart	3,000	1,400	1,600	15	3
		Plow	38,150	21,400	16,750	190.75	38
	<b>Total</b>		<b>350,938</b>	<b>211,762</b>	<b>139,196</b>	<b>1,754.69</b>	<b>351</b>
5	Sary-Tor	Tractor	35,000	20,000	15,000	175	35
		Sprayer	12,000	7,500	4,500	60	12
		Digging machine	64,000	39,500	24,500	320	64
		Mobile sprayer	5,000	2,000	3,000	25	5
	<b>Total</b>		<b>116,000</b>	<b>69,000</b>	<b>47,000</b>	<b>580</b>	<b>116</b>
6	Tasma-karanar	Seeder	18,000	60,000	120,000	514	103
		Disc harrow	17,500	11,000	6,500	50	10
		Sprayer	70,000	17,000	53,500	200	40
	<b>Total</b>		<b>267,500</b>	<b>88,000</b>	<b>180,000</b>	<b>764</b>	<b>153</b>
7	Belsovkhos O	Sprayer	15,000	10,500	45,00	75	15
		Seeder	96,600	68,000	28,600	483	97
	<b>Total</b>		<b>111,600</b>	<b>78,500</b>	<b>33,100</b>	<b>558</b>	<b>112</b>
8	Shab	Sprayer	15,000	11,000	4,000	75	15
		Rotary plow	8,900	2,670	6,320	44.5	9
		Seeder	50,400	15,120	37,210	252	50
		Fertilizer spreader	16,500	4,950	11,550	82.5	17
	<b>Total</b>		<b>90,800</b>	<b>33,740</b>	<b>57,060</b>	<b>454</b>	<b>91</b>
9	Kara-Kungey-Ukok	Sprayer	6,000	4,000	2,000	30	6
		Seeder	15,000	10,000	5,000	75	15
		Disc harrow	15,000	10,000	5,000	75	15
		Potato planter 2-row	6,000	4,000	2,000	30	6
		Grass mower	6,000	4,000	2,000	30	6
		Spreader	6,000	4,000	2,000	30	6
		Fodder Harvester	6,000	4,000	2,000	30	6
		Potato planter 1-row	6,000	4,000	2,000	30	6
	<b>Total</b>		<b>66,000</b>	<b>44,000</b>	<b>22,000</b>	<b>330</b>	<b>66</b>



	WUA	Equipment	Income	Expenses	Profit	Hectares	Number of Farmers
10	Ak-Marcha	Seeder	20,000	14,000	6,000	100	20
		Disc harrow	15,000	10,000	5,000	75	15
		Sprayer	6,000	4,000	2,000	30	6
		Potato planter	6,000	4,000	2,000	30	6
		Grain cleaner	12,000	8,000	4,000	60	12
	<b>Total</b>		<b>59,000</b>	<b>40,000</b>	<b>19,000</b>	<b>295</b>	<b>59</b>
11	Mol-Bulak	Sprayer	45,000	35,000	10,000	225	45
		Cultivator	80,000	60,000	20,000	400	80
		Fertilizer spreader	10,000	5,000	5,000	50	10
		Harvester	65,000	35,000	30,000	325	65
	<b>Total</b>		<b>200,000</b>	<b>135,000</b>	<b>65,000</b>	<b>1,000</b>	<b>200</b>
12	Talaa-Bulak	Baler	45,000	30,000	15,000	225	45
		Seeder	45,000	30,000	15,000	225	45
	<b>Total</b>		<b>90,000</b>	<b>60,000</b>	<b>30,000</b>	<b>450</b>	<b>90</b>
13	Toktomush	Potato planter	46,000	28,000	18,000	230	46
		Potato digger	60,000	44,000	16,000	300	60
		Sprayer	14,000	8,000	6,000	70	14
		Disc harrow	20,000	12,000	8,000	100	20
			15,000	12,000	3,000	75	15
		Cultivator	30,000	18,000	12,000	150	30
	<b>Total</b>		<b>185,000</b>	<b>122,000</b>	<b>63,000</b>	<b>1,825</b>	<b>365</b>
14	Zhany-Tilek	Seeder	30,000	15,000	15,000	150	30
		Disc harrow	25,000	10,000	15,000	125	25
		Seeder	30,000	15,000	15,000	150	30
	<b>Total</b>		<b>85,000</b>	<b>40,000</b>	<b>45,000</b>	<b>425</b>	<b>85</b>
15	SHM	Tractor	60,000	20,000	40,000	300	60
		Sprayer	45,000	35,000	10,000	225	45
		Fertilizer spreader	15,000	5,000	10,000	75	15
		Rake	1,2000	6,000	6,000	60	12
	<b>Total</b>		<b>132,000</b>	<b>66,000</b>	<b>66,000</b>	<b>660</b>	<b>132</b>
	<b>Total North</b>		<b>1,970,298</b>	<b>1,062,217</b>	<b>908,081</b>	<b>10177.5</b>	<b>2,078</b>
<b>South Region</b>							
1	Sulaiman-Suu	Tractor, plow	60,000	24,200	35,800	35	30
2	Kyzyl-Boston	Tractor (4)	1,660,000	1,245,000	415,000	230	150
3	Tilla-Suu	Tractor (4)	180,000	135,000	45,000	58	40
4	Ene-Sai-South	Tractor (4)	410,000	210,000	200,000	198	185
5	Kyrk-Bulak	Combine, mini tractor	1,680,000	1,120,000	560,000	205	193
6	Khoja-Aryk	Tractor, plow	100,000	40,000	60,000	50	67
7	Kurshab-Arzybek	Tractor, Plow	88,000	40,000	48,000	45	55
	<b>Total South</b>		<b>4,178,000</b>	<b>2,814,200</b>	<b>1,363,800</b>	<b>821</b>	<b>720</b>
	<b>Total (in Republic)</b>		<b>6,148,298</b>	<b>3,876,417</b>	<b>2,271,881</b>	<b>10998.5</b>	<b>2798</b>

Source: PIU.



## ANNEX 11. NUTRITION PROGRAM

1. To support increased food and nutrition security, the project financed nutrition education, dissemination of information on nutrition and health issues, improved domestic gardening to produce a greater quantity of nutritious vegetables and to increase household incomes, strengthening of Village Health Committees (VHCs), and improved national coordination for food and nutrition security.
2. **Nutrition Education.** The project trained 1,269 medical workers (93 percent women) in 60 AAs on IYCF, and nutrition and anemia in women of reproductive age (WRA) and adolescent girls, exceeding the target by 5.7 percent. On a wider scale, the training was incorporated in national-level training, and a large community-level campaign was carried out with multiple events. In the same 60 AAs, 130,255 households were trained on topics such as the importance of a varied diet, anemia prevention, IYCF practices, food safety, and sanitation and hygiene with the help of 4,500 volunteers. The Project also provided training for 225 VHCs and, in villages where no VHCs existed, local Initiative Groups which were then converted to VHCs. This activity increased the number of volunteers providing outreach on nutrition and other health topics.
3. The nutrition education program was two-fold: (1) strengthening the capacity of health workers by increasing knowledge and skills to improve the quality of medical services at the level of Primary Health Care (PHC) level on dietary diversity and the prevention of anemia in children, adolescent girls, WRA, pregnant and lactating women; and (2) at community level disseminating messages on importance of (i) early initiation and promotion of exclusive breastfeeding during the first six months of life, as well as breastfeeding up to two years; (ii) timely and correct transition to supplemental nutrition using appropriate supplements; (iii) fortification of home-made foods for children aged 6 to 24 months with trace elements and vitamins; (iv) a complete diet of pregnant women containing foods with folic acid and iron; (v) promoting the provision of nutritional supplements to pregnant women, taking into account their special needs; (vi) raising awareness of pregnant women about preparation for conception and childbirth (including balanced nutrition, intake of trace elements, consumption of fortified foods and treatment of anemia); (vii) popularization of sanitary and hygienic measures (washing hands with soap and control of infectious and parasitic diseases); (viii) stimulating the diversification of the diet, especially through crop production on household plots; (ix) dissemination of information messages to encourage parents to improve learning opportunities for young children.
4. The project had not envisioned collecting anthropometric data such as anemia rates. Even though data on anemia was not sampled or measured, the ICR team has reasons to believe that anemia rates among project beneficiaries decreased. This is because according to the independent endline evaluation: (1) 63 percent of project participants applied skills and knowledge on anemia prevention as opposed to 97.3 percent endline; (2) even though there was no evidence that more women started taking iron supplementation due to the project (both at baseline and endline 74 percent of women with children under two years of age took iron-containing tablets (with iron-folic acid) which indicates a stable practice among mothers), the proportion of mothers who took iron-containing tablets for more than 90 days increased by 23% due to project information campaigns; (3) 76% of children (2-6 years old) whose mothers participated in the project trainings consumed 4 and more food groups as opposed to 64% of children whose mothers did not; (4) more than 91% of adolescents received a sufficient dose of foods enriched with iron; (5) 92% of children over the age of 2 ate foods rich in iron, which is 6% more than those who did not participate in project's nutrition education and training.



5. **Dissemination of information on nutrition and health issues.** A local Non-Governmental Organization, Kyrgyz Aiyldik Den-sooluk Committee (KADK), was hired to work with 60 local self-governments (*Aiyl Okmotu*, AO) to hold annual events to disseminate information on nutrition and health issues, with almost all AOs allocating funds (ranging from KGS 5,000 to 1 million) from their budgets. Under this activity, an information campaign “Responsible Parenthood” was held with local communities involving 10,230 people (6,150 women). In the context of World Clean Hands Day, information events were held for AOs and village activists in secondary schools, kindergartens, AO venues and village clubs in 60 AAs with 7,451 participants (2,830 women and 4,072 children). Further, seminars with heads of secondary schools in seven regions were held to further disseminate nutrition information to adolescent girls covering 237 people (183 women). Information meetings on these topics were added to the program events organized by schools with parents and groups of students. These training and information activities contributed to improved nutrition and helped establish longer-term nutrition programs and methodology for the country.

6. **Provision of micronutrient and vitamin supplements.** The original plan was for APNIP to acquire Iron Folic Acid (IFA) tablets for distribution to women and micro-nutrient powder (*gulyzak*) for use by children under five. Discussions were underway for the government to do the procurement, however, the MOH determined that *gulyzak* was a “biologically active supplement”, and hence, could not be procured by the government. Options were discussed with the World Bank, the most acceptable being procurement of crushable micronutrient tablets available through UNICEF or doing social marketing to convince families to purchase *gulyzak* directly from local pharmacies. While there was some doubt as to the consistent quality of locally produced *gulyzak*, social marketing seemed to be the best option, along with promotion of routinely feeding children iron-rich foods, desist giving them tea, and to prevent and treat helminth infections. For monitoring distribution of the IFA through the government system to the target AAs, an Excel-based monitoring system was to be developed and tested before the IFA distribution started. However, procurement was delayed for various reasons, including unclear dosage and permit requirements, and logistical issues related to storage and delivery. In view of the unresolved delays and the urgent need to address food security concerns considering the COVID-19 situation, the Government requested to cancel Subcomponent 3.2 and redirect the funds to purchase of seeds and fertilizers.

7. A lesson learned is to detail as much as possible the exact requirements for supplements and logistics (procurement and distribution) at project design. However, the project may not have procured and distributed IFA, but it continued to advocate for their uptake by the target population, and the endline evaluation showed that even though there was no evidence that more women started taking iron supplementation due to the project (both at baseline and endline 74% of women with children under two years of age took iron-containing tablets which indicates a stable practice among mothers), the proportion of mothers who took iron-containing tablets for more than 90 days increased by 23% due to the project information campaigns. Moreover, formative research had found that that Vitamin C source foods were not consumed during winter, and this affects iron absorption, hence, is related to anemia. The project thus supported production and consumption of vitamin C source foods.

8. **Domestic Gardening.** To improve food quality and quantity from household plots, 1,340 SHGs were established from 2018-2021 in 246 villages covering 11,100 people (including 89.5 percent women). Each group received good-quality certified seeds of a range of vegetable or fodder crops plus a season-long training program in production, storage, and processing. The average increase in yields for SHG members was 27 percent for vegetables and 31 percent for fodder crops compared with farmer's practice. The production increases resulted in an increase in sales income averaging about KGS 10,480 in each year for SHG participants as well as an increase in household consumption of vegetables. To enhance benefits, small equipment including plastic tunnels, plexiglass greenhouses, drip irrigation, drying ovens, walk-behind tractors (moto-blocks) and other small





equipment was then provided to all well-functioning SHGs. ICR mission observations indicated that these items were highly valued and put to good use. The training program was also highly valued, with 83 percent of SHG members implementing their knowledge of nutrition and processing compared with a baseline of 35 percent. SHGs visited by the ICR team were continuing to operate and were functioning well, including group use of shared equipment (such as greenhouses and drying ovens), continuing to meet regularly, sharing information, and collecting funds for activities including purchase of new seeds. Most SHGs had maintained the same membership, but others had increased in number. In some cases, SHGs expanded their menu of nutritious crops to include fruits, berries, and other vegetables.

**9. Improved national coordination for food and nutrition security.** The project also aimed to improve national coordination for food and nutrition security. Several activities were implemented to strengthen the capacity of the GoK bodies and other stakeholders to ensure the institutional sustainability of food security and nutrition programs. The APNIP contracted consultants to form an Expert Group (EG) to support the Food Security Council (FSC) which, by time of project effectiveness, was under the Ministry of Agriculture (after initially being under the Vice Prime Minister's Office). The FSC received technical oversight and assistance from the Food and Agriculture Organization (FAO), World Food Program (WFP), and United Nations Children's Fund (UNICEF), and the EG worked closely with them. The EG effectively met the substantial capacity gap in food security and nutrition (FSN) policy planning and development, advocated for FSN issues across various platforms, was instrumental in revising and developing the new FSN program for 2019–2023, and disseminated knowledge and information on FSN. Project funding for the EG ended on December 31, 2019, after about two years. So far, the GoK could not find budget resources to continue the EG as planned, although other development partners such as UNICEF and FAO continued to build the FSC capacity through their regular programs.

**10. Project coordination of nutrition and health activities.** An Inter-Ministerial Steering Committee included the Ministry of Finance, Ministry of Health, and Ministry of Agriculture. Nutrition education material was cleared with MOH, and MOH was involved in the discussion on Sub-component 3.2 (and procurement of IFA and other supplements. Sub-component 3.1 strengthened the capacity of health workers by increasing knowledge and skills to improve the quality of medical services at the level of Primary Health Care (PHC) under MOH. The project also achieved inclusion of the educational programs "IYCF" and "Nutrition and Anemia in WRA and Adolescent Girls" in the calendar and thematic plan of the National Institute for Training of Medical Workers for further use in the programs of continuous professional development of medical workers at the level of PHC.

**11. Other projects.** Regarding nutrition, the Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project had operated in the Kyrgyz Republic from 2014 to 2018, and APNIP coordinated with SPRING (approach, material etc.). Moreover, formative research was conducted at project commencement to fill gaps in understanding of household practices and to assess feasibility of different education channels to plan effective interventions and activities to achieve project outcomes for Subcomponents 3.1, 3.2, and 3.3. The formative research was designed to complement rather than duplicate other recent studies in the Kyrgyz Republic.



## ANNEX 12. LIST OF SUPPORTING DOCUMENTS

- APNIP Project Appraisal Document (PAD), December 3, 2015. Report No. PAD601
- World Bank Country Partnership Strategy Report No, 78500-KG, June 2013
- World Bank, Kyrgyz Republic Poverty Assessment, Oct 2007, Report No. 40864-KG
- World Bank, On Farm Irrigation Project
- Grant Agreement between KYRGYZ REPUBLIC and INTERNATIONAL DEVELOPMENT ASSOCIATION acting as Trustee of the Global Agriculture and Food Security Multi-Donor Trust Fund, GAFSP GRANT NUMBER TFOA0645, March 18, 2016
- World Bank APNIP Restructuring Paper 2020, Report No. RES41244.
- World Bank APNIP Restructuring Paper 2022, Report No. RES50016
- Country Partnership Framework for FY19-FY22, October 10, 2018, Report No. 130399-KG
- Country Partnership Framework for FY24-FY28, June 22, 2023, Report No. 182689-KG
- Independent Impact Assessment Survey for OIP-1 (P049723), completed January 2013
- World Food Programme, Kyrgyz Republic Food Security Assessments: 2012, 2013, and 2014. For 2012, see [https://cdn.wfp.org/wfp.org/publications/WFP%20Kyrgyzstan%20EFSA%20September%202012%20\(FINAL\).pdf](https://cdn.wfp.org/wfp.org/publications/WFP%20Kyrgyzstan%20EFSA%20September%202012%20(FINAL).pdf)
- Asian Development Bank. Agriculture Area Development Project: Project Completion Report. June 2011.
- National Sustainable Development Strategy 2013–2017, approved by Governmental Decree No. 218 on April 30, 2013. See for example [National Sustainable Development Strategy for the Kyrgyz Republic for the period of 2013-2017. | UNEP Law and Environment Assistance Platform](#). This also gives link to original in Russian.
- Concept of Food Security of the Kyrgyz Republic 2009-2019, June 30, 2009. See [Approved by the Ministerial Collegium \(gafspfund.org\)](#).
- Food Security and Nutrition Program 2014–2017. See for example, *Food security And Nutrition Programme for Kyrgyzstan in Action. How to Implement Policy in the Most Efficient Way? (fao.org)*
- Food Security and Nutrition Programme for 2019–2023. See *Food Security and Nutrition Program in the Kyrgyz Republic for 2019-2023. | UNEP Law and Environment Assistance Platform*. This also links to the original in Russian.
- State Program for the Development of Irrigation 2017–2026, approved by Governmental Decree no. 440, July 21, 2017. See *Order of the Government of the Kyrgyz Republic "About approval of the State program of development of irrigation of the Kyrgyz Republic for 2017-2026..." (cis-legislation.com)*.
- National Development Strategy 2018–2040, November 2018. See *National\_Development\_Strategy\_of\_KR\_2018-2040\_final\_ENG.docx (live.com)*



**Aide-memoires for missions of:**

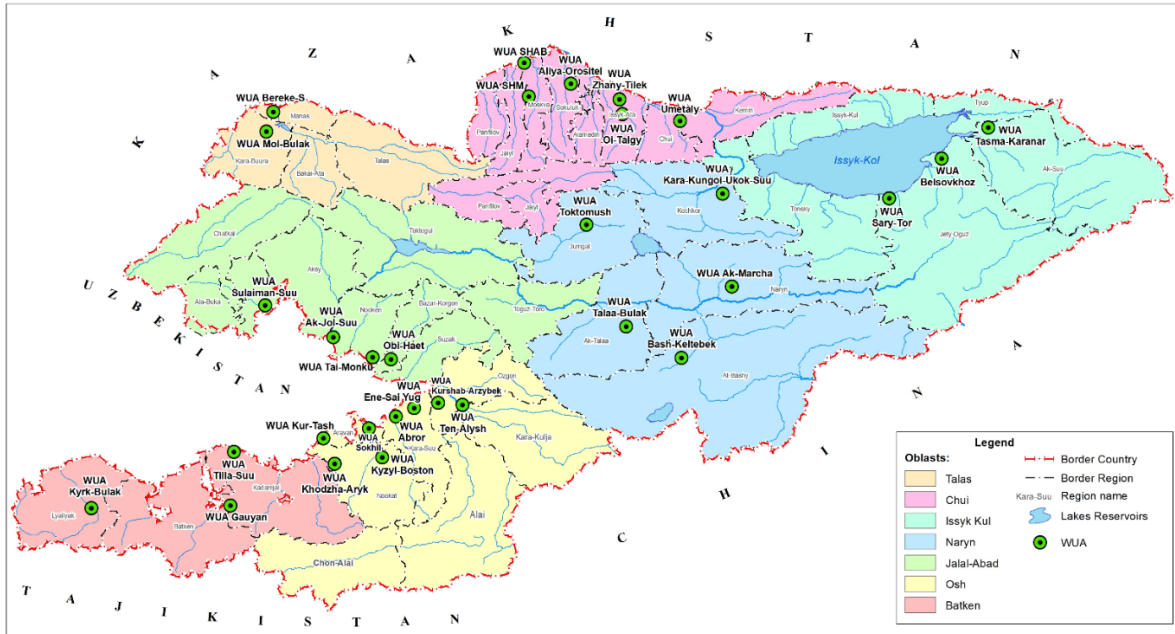
1. November 15, 2015- February 15, 2017
2. June 19-25, 2017
3. November 19-25, 2017
4. June 10-20, 2019
5. February 24-March 13 (Technical Review), May 21-22, 2020 (MTR)
6. December 14-25, 2020
7. June 14-21, 2021
8. February 7-15, 2022
9. May 30-June 10, 2023 (Technical Review) & July 4-12, 2022
10. December 5-9, 2022
11. June 5-16, 2023

**Implementation Status and Results Reports (ISRs)**

1. February 2016
2. October 2016
3. April 2017
4. November 2017
5. May 2018
6. January 2019
7. June 2019
8. December 2019
9. June 2020
10. December 2020
11. February 2021
12. June 2021
13. January 2022
14. April 2022
15. September 2022
16. December 2022
17. June 2023



ANNEX 13. MAP





#### ANNEX 14. FARMER AND LOCAL REPRESENTATIVE QUOTES

*For example, if you don't water the corn in time, it will already grow poorly or perennial, the same thing. If they are not watered in time, growth stops. Now it has become much easier with this, the productivity has increased. **AO representative, project village, Chui***

*The main result that immediately catches the eye is our irrigation system, as I said, there were problem areas where it was necessary to wait almost a day for water to reach, it already comes within an hour, it saves water a lot, the main resource can be said. **AO representative, project village, Chui***

*Since 2019, there has been one problem with the ground channel. Here we concreted 4 km, conducted water. Partially solved the problems with water. Previously, the water did not reach, but now we water it every year and we get a harvest. **AO representative, project village, Osh***

*Of course there were improvements. Water was in abundance from the very moment of planting until their full germination. During watering. For example, when planting pepper, water was immediately given when planting the greenhouse itself. I think the most important thing for farmers is that there are no problems with irrigation water. **SHG representative, project village, Batken***

*I have 4 channels, APNIP has covered all 4 channels. This means that the APNIP was involved in 1056 hectares. There is a locality of Myrza-Aryk, where pipes and «ulker» were created at 700 m. There is a Bam canal, two large mudflats were made there, a head structure, a tray-shaped channel was filled at 1 km 700 meters. On the Uchbai channel, 2 large mudflow drainage system were made. So, they have fully provided 1056 hectares of land. The APNIP project has had an impact. We are now providing water on time; the channels have been rehabilitated. **WUA representative, project village, Osh***

*Yes, it has increased. Over the past two or three years, the budget has risen well, if it was 1 million 100 thousand, then it became 1 million 300 thousand, 1 million 500 thousand. Every year it grows by 200 thousand. **WUA Director, project village, Osh region***

*think the project has achieved all the goals. Because people have a lot of new useful information that needs to be dried, frozen, that there is harm in cans, there is botulism, it turns out we can cook harmful preservatives for ourselves and suffer. I don't know, but I go among the population, they all know, they all talk about the benefits. And the prevention of anemia works. And people have important information on proper nutrition and breastfeeding, so that women use the baby for 1000 days only in favor. And such discussions were very active and interesting for us, we even invited and participated our husbands. And the fathers also now know such information. **WUA representative, Kulatov-Yntymak village***

*"To say that it has become balanced, diverse, yes it has, because we used to do it, we grow beans, they didn't eat beans. Here are the last ones that began to be given, the children began to eat beans, they make soup. **Medical representative, Talas region***

*I think we need to inform and educate even more people. For example, we, the participants of this project, talk about the project wherever possible, and we are ready to participate in such projects, and continue to work like this. **SHG representative, Sakaldy village***

Source: End line survey. Analytical Report: The Final Evaluation of APNIP. M-Vector, June 2023.



**ANNEX 15. PHOTOGRAPHS OF APNIP ACTIVITIES**

WUA Jany-Tilek



*Maize planting*

Self-Help Group



*Motoblock*



*Plastic house*

Agricultural machinery



*Seed drill*



*Tractor*



*Tractor and excavator*



On-Farm Demonstration

Self-Help Group



*Drip Tank*



*Drip lines*



*Field Training*



*Nutrition Training*



*World Clean Hands Day*

**Rehabilitation of irrigation infrastructure : Before and after civil works**

WUA «Jany-Tilek »  
Issyk-Ata rayon, Chui region

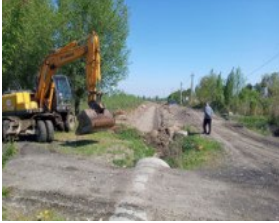


WUA «Ene-Sai-South»  
Kara-Suu raion, Osh region





WUA «Abror»  
Kara-Suu rayon, Osh region



WUA «Khodja -Aryk»  
Nookat rayon, Osh region

