KYRGYZ REPUBLIC

MINISTRY OF AGRICULTURE, FOOD PROCESSING AND LAND IMPROVEMENT OF THE KYRGYZ REPUBLIC

DEPARTMENT OF WATER RESOURCES AND LAND IMPROVEMENT

AGRICULTURAL PRODUCTIVITY AND NUTRITION IMPROVEMENT PROJECT

ENVIRONMENTAL MANAGEMET PLAN

For subproject WUA «Umetaly», Kemin rayon, Chu oblast

Environmental Consultant **Neronova T.**

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CONTENT

Abbreviations and acronyms

AAS	Agricultural Advisory Services
AISP	Agricultural Investment and Services Project
AHE	Ameliorative Hydrogeological Expedition of DWRLI
APNIP	Agricultural Productivity and Nutrition Improvement Project
DSES	Department of Sanitary and Epidemiological Supervision
DWRLI	Department of Water Resources and Land Improvement
E	Environment
EA	Environmental Assessment
EMP	Environmental Management Plan
IDA	International Development Association
ISF	Irrigation Service Fee
GPAFS	Global Program for Agricultural and Food Security
GWT	Groundwater table
KR	Kyrgyz Republic
OIP-2	Second On-farm Irrigation Project
OIP-2 AF	Additional Financing for OIP-2
O&M	Operation and maintenance
PIU	Project Implementation Unit
POL	Petroleum, Oil and Lubricants
RSU	WUA Rayon Support Unit
RVK	Rayon Irrigation Department (Rayvodkhoz)
SAEPF	State Agency for Environmental Protection and Forestry
SanPin	Sanitary Regulations and Rules
SETI	State Environmental and Technical Inspectorate
WBSMQRS	World Bank safety measures quality rating system
WUA	Water Users Association
MASL	Meters above sea level
CDN	Collector and drainage network
NSR	Night storage reservoir
DSR	Decade storage reservoir
HCR	Hydraulic cross-regulator

1. Introduction

The Agricultural Productivity and Nutrition Improvement Project(APNIP) for the Kyrgyz Republic is being implemented by the International Development Association (IDA) and financed by the Trust Fund of the Global Program for Agricultural and Food Security (GPAFS). Within APNIP framework the Environmental Management Plan (EMP) prepared and aimed at ensuring that the subproject complies with the principles and practices of environmental management and environmental protection policy and legal requirements of the Government of the Kyrgyz Republic, as well as IDA policy on environmental safety interventions.

The environmental assessment (EA) goals are to identify the subproject's significant impact on surrounding environment (positive and negative), identify appropriate preventive and mitigation interventions aimed to minimize or eliminate any expected irreversible impacts. EMP serves as a management tool that ensures proper implementation of interventions to prevent and mitigate the environmental impact, as well as monitoring and institutional strengthening of recommended interventions while implementing the subproject. EMP also establishes the necessary institutional obligations, proposes timing of the implementation of mentioned activities and cost estimates for the subproject's budget. APNIP, in the World Bank environmental risks system, is classified as "B" category. No irreversible or significant impact(s) on the surrounding environment is expected.

Based on the general EMP, the Environmental Management and Monitoring Plan (EMMP) for the rehabilitation of WUA "Umetaly", Kemin rayon, Chu oblast has been developed, taking into consideration the specifics of this particular subproject.

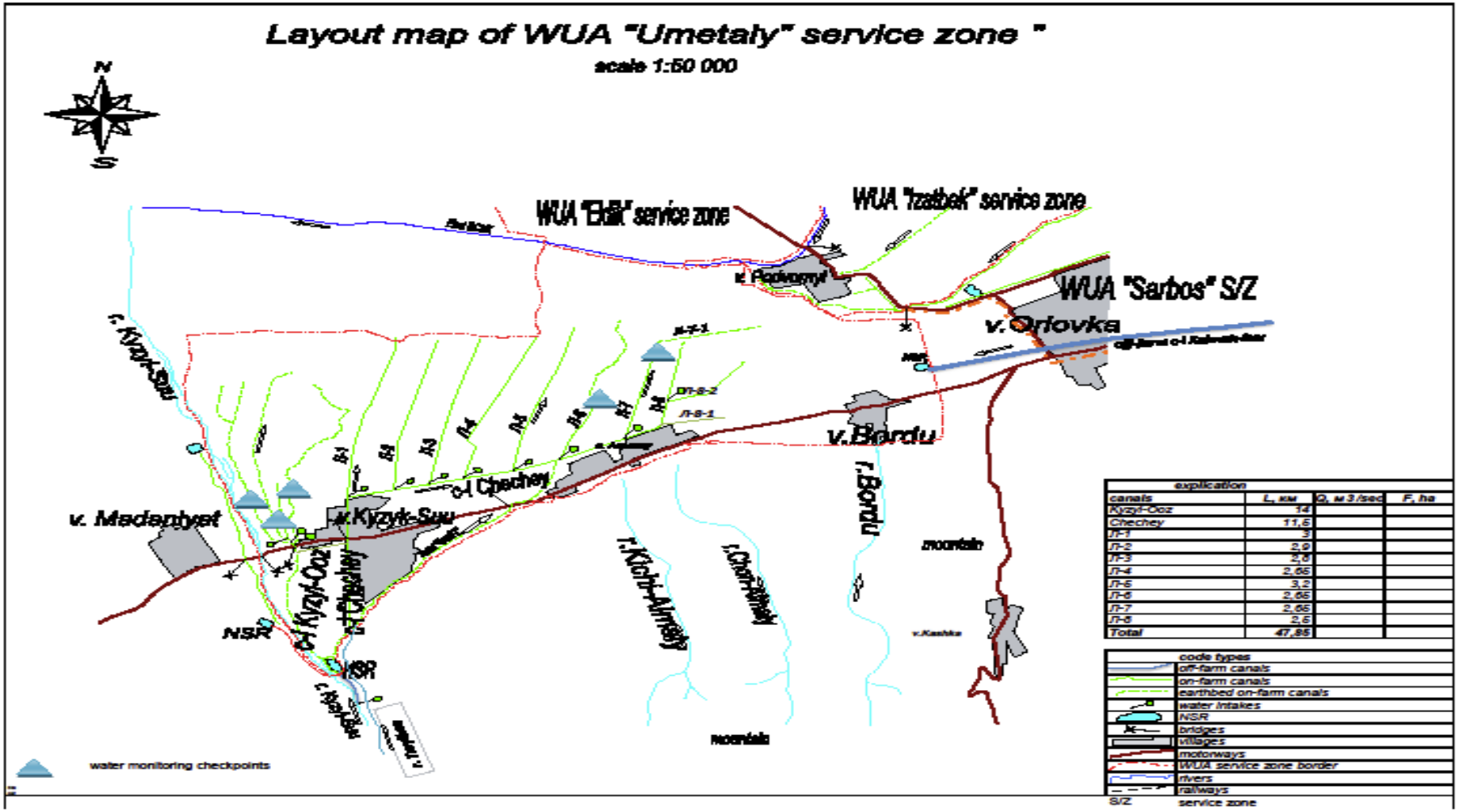

Image 1. WUA «Umetaly» irrigation canals layout map.

2. Description of subproject under rehabilitation

The WUA "Umetaly" is located on the territory of the Almalu AA, Kemin rayon, Chu oblast, 100 km off Bishkek and 24 km off regional center Kemin. WUA's serviced area - 2175 ha. The landscape height ranges from 1200-1250 masl. WUA includes 640 farming entities. The population - 2539 people. The WUA's command irrigated area – 2175 ha and provided with irrigation and drainage infrastructure. The total length of on-farm canals - 47.9 km. Of which, 18.9 km – concrete lined, 29 km – earthbed. The canals` efficiency - 56%, resulting in water losses and irrational water use, raising the GWT. The on-farm network owns: HTS -71, bridges and crossings points - 11, and NSR - 1. The NSR rehab is not planned under the subproject. The off-farm canals designed with a slope from south to north, and from east to west, and on-farm canals from east to west.

2.1. Technical condition of subproject under rehab

The subproject planned partial rehab of off-farm and on-farm canals. The total length of on-farm canals - 47,9 км, of which, 18,9 км – concrete lined, 29,0 км - earthbed. The main issues seen on canals are; disintegration of a canal's sections, lowered throughput, enormous filtration losses, canals' erosion, hydroposts, water outlet and cross-regulators' failure and disintegration, emergency condition of bridge-crossings. Because of lack of hydroposts, water control and metering is not performed or done inadequately. To improve water metering and control, the subproject planned to install 6 water metering devices within all on-farm systems. The main cultivated agricrops; winter wheat, maize, vegetables, perennial grasses and cucurbits crop.

All on-farm canals owned by WUA «Umetaly» were built during the Soviet period and in earthbed. With the start of agrarian reformation, at the beginning of 90th, the farmers were apportioned with land plots, however, on-farm irrigation network was left without proper ownership for decades, which resulted in the canals` throughput significant reduction, filtration and technical losses, and irrigation water distribution and metering aggravation. The WUA's command area provided with irrigation water from two water sources; off-farm canal «Kyzyl-Suu» and off-farm canal «Kalmak-Suu». The irrigation water is fresh, mineralization type is hydrocarbonate-calcium-magnesium, water feeding is glacial-snow and springs.

There is no CDN in the WUA`s territory. The ameliorative condition of irrigated land is satisfactory. While examining canals planned to go under rehab and the territories adjacent to them, it has been found:

1. The earthbed canals are overgrown and the throughput is practically reduced to zero, there was no water in canals;
2. Pipe-crossings and hydraulic structures disintegrated;
3. canals location is outside of residential areas, therefore, (re)construction work will not affect the population and surrounding environment.
4. Alongside of canals, a large spots of vegetation grows, which is subject of felling/cutting.

2.2. 2. Description of interventions executed within subproject

2.2.1. Off-farm canal Kyzyl-Suu

The off-farm canal Kyzyl Suu is on the balance sheet of Keminsky RVK. The total length - 0.7 km. The command irrigated area - 3258 ha, of which 1,695 ha belongs to WUA "Umetaly". The headwork and canal built in 1978. The irrigation water is divided between two rayons, in proportion to the command irrigation area: Kemin rayon receives 52% and Chu rayon receives 48%. The entire length of canal is in concrete lining. Condition assessed as satisfactory.

2.2.2. Off-farm canal Kalmak-Suu

The canal abstracts water from the interdistrict canal ZBChK/ЗБЧК and is on the balance of Kemin RVK. Year of commissioning - 1982. Fully in L-shaped blocks. The command irrigation area - 3,817 ha, of which 480 ha belongs to WUA "Umetaly". The subproject provides partial rehab of the canal from HM 112 + 40 to HM 118 + 40.

ON-FARM CANALS

2.2.3. C-l Kyzyl-Ooz

The total length of canal - 3.95 km and in earthbed. The existing water distribution structures are plight condition, water metering devices absent. The command irrigated area - 648 ha. The subproject ensures:

- Concrete lining of canal`s section at length 2.2 km;
- Installation of 1 HP, 2 water outlets, 3 pipe-crossings, 1 turning well and 1 double distributor.

2.2.4. C-l Tarylgan

The total length of canal – 3.5 km and in earthbed. The subproject ensures:

- Installation of 1 HP, 1 water distribution structure, 1 transition section and mechanized cleaning at length 1.5 km.

2.2.5. C-l Chechey-1-2

The subproject ensures replacement of broken L-shape prefabs and construction of HP.

2.2.6. C-l Chechey-2

The total length of canal - 2,85 км and in earthbed. The command irrigated area - 496 ha.
The subproject ensures:

- Monolithic Concrete lining of canal;
- Installation of 1 HP, 10 pipe-crossings, 3 water distribution structures, 9 – singe-gate distributor.

2.2.7. C-l Chechey-3

The total length of canal - 8,6 км and in prefabs. The subproject ensures following:

- Replacement of broken prefabs (10 pcs):
- Metal structures furnishing, L-shape blocks installation (8 pcs) e.t.c.

2.2.8. C-l Л-1

The total length of canal - 3,0 км and in prefabs. The lower reach of canal completely destroyed, water outlets in faulty condition. The subproject ensures replacement of faulty and missing prefabs and rehab water outlet structures.

2.2.9. C-l Л-2

The total length of canal - 2,9 км and in prefabs. The lower reach of canal completely destroyed, as several prefabs from lower reach were used as replacement for upper reach of the canal. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets.

2.2.10. C-l Л-3

The total length of canal - 2,8 км and in prefabs. The lower reach of canal completely destroyed. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets.

2.2.11. C-l Л-4

The total length of canal - 2,65 км and in prefabs. The lower reach of canal completely destroyed. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets.

2.2.12. С-l Л-5
The total length of canal – 3,2 км and in prefabs. The lower reach of canal completely destroyed. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets

2.2.13. С-l Л-6
The total length of canal - 2,65 км and in prefabs. The lower reach of canal completely destroyed. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets.

2.2.14. С-l Л-7
The total length of canal - 2,65 км and in prefabs. The lower reach of canal completely destroyed. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets.

2.2.15. С-l Л-7-1
The total length of canal - 1,0 км and in earthbed. The canal`s command irrigated area - 85 ha.

- Section of the canal is planned to line with monolithic concrete at length 1 km;
- Installation of 1 water distribution structure, 3 single-gate outlet, 1 pipe-crossing, 1 HP, 1 transition section.

2.2.16. С-l Л-8
The total length of canal - 2,9 км and in prefabs. The lower reach of canal completely destroyed. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets

2.2.17. С-l Л-8-1.
The total length of canal - 1,0 км and in earthbed. The canal`s command irrigated area - 87 ha.

- The subproject ensures monolithic concrete lining at length 1 km;
- Installation of 9 single-gate outlets, 1 HP, 1 pipe-crossing and 1 transition section.

2.2.18. С-l Л-8-2
The total length of canal - 0,5 км and in prefabs. The canal`s command irrigated area - 89 ha. The subproject ensures replacement of faulty and missing prefabs and rehab water outlets.

Water reservoirs, dams and dikes rehabilitation is not planned. Therefore, the dams' safety policy (OP 4.37) is not applicable.
Construction and rehabilitation works deadline: years 2019-2020

3. Description of environmental parameters at the site

3.1. Climate

The rayon`s climate is continental: cold winter, hot summer, warm short spring and dry autumn. The minimum air T˚ is observed in December, January and February. The average duration of frost-free period is 172 days. The yearly distribution of precipitation is uneven. During vegetation period (April-September) the precipitation volume is 202 mm, for the remaining months 169 mm. The snow cover is set, on average, in the second decade of November, the average date of snow melting is at the end of March. In the eastern part of Chu valley, the east and west wind directions prevail. The eastern winds blowing from the Boom gorge are characterized by their recurrence. These are mainly dry winds, blowing mostly in summer, which contribute to lower air humidity and soil drying. Their speed does not exceed 3 m/s. A significant role is also played by westward

winds, which are usually gusty and of considerable force. The average speed ranges from 2 to 3.0 m/s.

The T˚ values of 5 degrees above averages 2860. The maximum depth of soil freezing is 100-110 cm. The T˚ mode fully satisfies the growth of heat-loving agricrops such as: sugar beet, cucurbits agricrops, grapes and others. The average monthly air T˚is characterized by the following data:

Air T˚ Table.

m\s Bishkek	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	год
air T˚	-8,6	-7	+0,4	+9,0	+14,1	+18	+20,8	+19,9	+14,9	+8,0	+2,1	-5,7	7,15

The greatest positive air T˚, up to +27.6˚, are observed in July-August, the maximum subzero temperature, -30-35˚, is observed in December and January. The first frosts are observed in November and the last frosts in March. The duration of the frost-free period is 172 days. The maximum depth of soil freezing is 100 cm. The average snow cover thickness in rayon does not exceed 20-50 cm. The annual precipitation ranges from 300 to 371 mm. The precipitation volumes in mm is given in Table below.

m/s Kemin	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	год
precipitation, mm	14	27	35	50	59	42	29	26	16	28	25	20	371

The uneven distribution of precipitation over the seasons and their insufficiency in the summer period, it could be assumed that the Kyzyl-Suu system belongs to the semi-arid zone, especially in the considered irrigation part, where the main irrigation areas are concentrated. In the spring time, precipitation volumes sum up to 40-45%. This eliminates the need for pre-arable spring irrigation, which is important for the Kyzyl-Suu system, since during spring time the river is very shallow.

- Average annual air T˚ +7,15°
- Absolute air T˚ maximum +27,6°
- Absolute air T˚ minimum -35,0°
- Average hottest air T° +24,8°
- Duration of frost-free period 172 days
- Annual precipitation volumes 371 мм
- Prevailing wind directions south-east

Average air T˚ (by 13-00):

- The coldest month of the year 58-64%
- The hottest month of the year 47-49%

The depth of seasonal soil freezing:

- Loam and clay 61,0 см
- Sandy, fine sands and dusty 66,0 см
- Gravel-sands, coarse and medium sands 71,0 см
- Macrofragmental soil 79,0 см

A steady snow cover is observed during 3 months, from the beginning of December to the end of February. Within the site, the winds of south-east points are characterized by the highest frequency, with average annual speeds of 2.2 m/s. The maximum depth of soil freezing is 110 cm, seismicity is 9 points.

3.2. Landscape

The geomorphological profile of the territory is indicative with two zones (Chon Kemin Valley and Chu Valley). The irrigation area is adjacent to the peripheral part of Kyzyl-Suu talus train, on a slightly hilly plain formed by the talus train and temporary watercourses. The northern border of the plain runs approximately 800 m horizontally, or the western tributary of BChK serves as the border. The absolute height above sea level ranges from 750-850 m. The surface slopes range from 0.005 to 0.002 from south to north.

3.3. Hydrology

The following rivers run through the WUA`s territories: Kyzyl-Suu, Kichi-Almalu, Chon-Almalu and Bordu. The mentioned rivers filled up with water in spring and autumn periods only and in rainy periods. And during the vegetation season the rivers dry out. The volumes of water flowing into the WUA`s territories from mentioned water sources are insignificant. The r. Kara-Suu is the most affluent.

Average multi-annual r. Kyzyl-Suu run-off

average monthly water flow, m^3/s												Q_{ave}, m^3/s	
I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**	**год.**	**Вег.**
0,02	0,03	0,05	0,08	0,8	1,5	2,5	2	1,1	0,02	0,01	0,01	0,68	1,33

average monthly run-off, th.m^3												W_{year}, th.m^3
I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**	
17,28	25,92	43,2	69,12	691,2	1296	2160	1728	950	17,28	8,64	8,64	7015,68

In the surrounding areas there are no entities that discharge hazardous chemicals, pesticides and sewage into the source of irrigation, and that may endanger surrounding environment.

3.4. Geo-engineering conditions

The piedmont zone consists of pebble and boulders deposits with different sand and gravel content, and covered with varying thickness of loam. The loam thickness in some places reaches about 10 m. According to the geotechnical complexity conditions degree the area falls into category II (medium complexity). The granulometric composition of loams is dominated by dusty fractions (92.9%) with a small content of coarse silt particles (48.9%). The content of coarse-clay particles averages 18%, the content of particles 0.001 mm averages 15.6%. The number of sand fractions is 3.44%, with the highest content of fractions 0.1-0.05 mm in size, on average 2.9%. The content of fractions less than 0.01 mm varies within range of 46-49%. According to the classification, the soil belongs to heavy loams. The maximum molecular moisture capacity is 15–18%, which allows consider the soil as light and medium loam. The soil in its natural condition is characterized by a skeleton volume weight of 1.31-1.69 g/cm³, and a bulk weight of moist soil of 1.45-1.99 g/cm³. The porosity ratio is 0.0616-0.976, rarely 1.099. GWT is at a considerable depth of more than 10 m. The ameliorative condition of irrigated lands considered as good.

3.5. Vegetation cover

The vegetation is represented by tree-shrubbery and grass cover. During (re)construction works performed, the soil and vegetation layer will be disturbed, as construction of a new canal bed(s) planned. Thus, in the work plan, it is necessary to provide locations for storage of soil and vegetation layer, or to transfer it to local authorities and residents, to use for agricultural purposes or landscape improvement. In the process of canals rehabilitation, it is necessary to execute tree felling that hamper course of works and are in the alienation zone of water facilities/structures.

According to the requirements of the Water Code of the Kyrgyz Republic, Art. 80 p.3, while executing repair and rehabilitation works, the shrubbery cutting and forest felling within the alienation zones of water management structures and canals, as well as sanitary cutting and deadwood cutting, do not require permission from specially authorized state agencies/bodies. Prior to commencement of work, the contractor will inform the environmental protection agency of forthcoming tree and shrub vegetation cutting to be conducted. If rehabilitation works to-be-conducted on the sections that are not within alienation water management zones, then tree and shrubbery cutting is the subject to approval with authorized environmental protection agencies/bodies. After rehab works completed, WUA members plan to plant trees to prevent wind erosion and considering access roads.

4. Description of procedures related to regular operation works

4.1. Technical supervision on canals and structures conditions

In the operational scheme activities, paramount importance is paid to the timely conduct of preventive and rehabilitation works that exclude probability of system failure, while complying to the rules of its operation. The main indicators of normal technical condition and reliable operation of the on-farm irrigation network are provision of designed canal's throughput, minimum filtration and performance specification water losses, absence of sedimentation, greenery overgrowing, collapse and canal's erosion. If the actual canal's capacity corresponds to the estimated throughput, then the technical condition of a canal is good and considered as reliable. If there are 20 -25% throughput deviations, then a canal's reliability is reduced, and the technical condition is an average. If the deviations are more than 25%, then a canal's performance considered as unreliable and its technical condition is below the average.

To ensure a canal's throughput, it is necessary to conduct a careful monitoring over water regulating structures. The water volumes regulating structures must be easily and reliably (re)adjusted and controlled. While operating water regulating structures, it is necessary to ensure that there is no water leakage through the water outlet gates and no canals' erosion and destruction on its structural parts. The lined sections, expansion and joint sections construction of a canal are the subject of constant surveillance. The damaged lining must be reworked immediately. A canal's lined sections must be of monolithic concrete and maintenance must be timely to prevent cracking. A particular attention must be paid to subsiding soils, as concrete lining on those soils is prone to cracks formation. A daily maintenance of lined and unlined canals, facilities and equipment located on them, keeping them in good condition is reduced to the removal of vegetation and floating objects that block canals and lead to sedimentation in certain areas. During the maintenance, works are carried out to clean up structures and water distribution units from debris and ice, vegetation overgrowth and sedimentation. A slight and gradual canal's base degradation, sometimes, leads to the formation of cracks on the lining that impossible to rehabilitate. In this case, the cracked and battered lining sections are cut down and filled with new concrete.

The joint sections of a canal, with prefabricated reinforced concrete slabs, are the subject of particular attention. Constant surveillance of which is necessary and, if there any urgency, must be treated with resilient water resistant materials that can withstand a vegetation impact. Within the prefabs it is prohibited to dissolve various types of fertilizers that may cause destruction of concrete. It is also not recommended the prefabs network operation if water flow temperature is below -5 - 10°C. Therefore, in the process of preparing the network for winter, the whole canal's route must be completely freed of water. The livestock crossing and pasturing on canal's dams and slopes is prohibited. The livestock drinking and dipping allowed on a special canal's section only. To monitor the quality of irrigation water and prevent a canal's sedimentation, the water samples must be regularly inspected for the following indicators: turbidity, temperature, hydrogen index and mineralization.

4.2. Preparing on-farm network for the winter period

In the winter period, the on-farm irrigation network can be used for water charging irrigation, washing off and other types winter watering, as well as for supplying water to the residential areas and livestock farms, filling up reservoirs. To the constant controlling on canals and structures operation, in the winter, should be paid particular attention, as to prevent formation of ice jams near bridges, crossings, etc. The trash racks that were set for the summer in front of water structures, must be removed for the winter. When frosts are formed and structures are covered with the ice, in this case the ice must be chipped without violating integrity of the structures and canal's lining.

4.3. Looking after wood lines and access roads

The forest plantations alongside of canals are designed to protect canals from vegetation overgrowing, lowering the level of groundwater along a canal's route and reducing the adverse effect of wind force on crops. Alongside of permanently located canals of the farming network that require constant desilting interventions, it is recommended to create, on the one side two-row or three-row strips of fast-growing trees and shrubs. The distances between trees in the strip is 1-3 m, between bushes - 0.75 - 1 m with the distance between greenery strips of 1.5 - 3 m. The field and on-farm access roads on irrigated area, as a rule, are ground roads. If they pass through silty loams and solonchaks, then a road is made of gravel or other coating. Roads maintenance is limited to keeping the upper layer in good condition. The thickness of gravel coated roads is maintained within 8 - 10 cm. The roadbed condition is also the subject of maintenance and must be periodically planned and compacted. The roadside cuvettes and canals must be cleaned of dirt and vegetation. To improve water flow into cuvettes, the roadways must be made with slopes and with a slight lateral inclination from the middle to the cuvettes.

4.4. Repair works

The irrigation schemes are subject to repair works according to the annually developed and approved plans. In the practice of irrigation and drainage systems operation, the current, major and emergency repair works are executed. The current repair works carried out annually and including desilting of canals, removal of vegetation, strengthening and widening dams, cleaning berms, eliminating small landslides, collapses, rifts and sandspits, repairing damaged anchorages and canals' lining, repairing small damages of a structure parts. While carrying out current repair works, a complex technical repair works and modifying a structural construction is not included. The preventive (prophylactic) repair works include:

- Patching ratholes;
- Structural cracks maintenance after ice impact;
- Tightening fixing bolts;
- Drainage structures winterization etc.

The preventive repair and a significant part of the current repair, including desilting of canals, vegetation and landslides removal, a minor canal repair(s), repair of structures, buildings and other devices are performed annually without stopping a system`s operation.
Major repair is carried out, as required, after few years' period and includes: repair works on a canal's sections, dams and parts of structures attritions and destructions, structural modification or replacement of certain elements and structural units.
Emergency repair - rehabilitation of canals, dams and structures or parts of them, destroyed as a result of natural phenomena (mudslides, floods, etc.), or violations of the technical operation rules, execution of which carried out 24/7, and all available material and technical resources and labor resources are mobilized for their implementation.

Repair and construction works on the on-farm network canals performed by WUAs contracting a construction company. Repair works expenses and operation of the on-farm network are annually provided by WUA budget.

4.5. Desilting of canals and vegetation removal

The solid particles of soil form sedimentation that moved around by water flow. The content of solid particles, per water volume unit, characterizes the water flow saturation with sediments, or its turbidity. Sediments, often, are formed as a result of soil wash-away in the catchment basin via snow/glaciers melting and rain waters. Partly the sedimentation is a product of a canal/river bed and banks erosion. The largest bed sedimentation with pebbles and coarse sand observed and remain within the head section of a bulk water supply canal. The average sized sediment particles washed into a canal's distribution network and even into on-farm irrigation network.
On average, about 80% of sediments remain in the off-farm canals network and about 20% inflow into on-farm irrigation network. A canal's inclination impacts on sedimentation process, if an inclination is too steep then about 60% of sediments washed in on-farm network and fields. Desilting executed on annual basis and, if necessary, more often.

5. Environmental impact

The implementation of APNIP is addressed to provide economic, social and environmental benefits to farmers, farmer entities and local communities through WUA's development, the rehabilitation and modernization of irrigation and drainage infrastructures in projected areas. The best practices of previous (sub)projects demonstrate positive impacts on the environment. In fact, many positive impacts of the (sub)projects have been identified during the environmental assessment. Namely, this subproject is aimed at reducing water losses in irrigation schemes, improving water resources management, improving agricultural productivity and improving soil fertility.

The design works require compliance with a number of mandatory requirements, including requirements to comply with noise reduction, air quality, timely removal of solid, liquid household waste and construction debris. The requirements to prevent environmental pollution and negative impact(s) on the population are ensured in the Law of the Kyrgyz Republic "General Technical Regulations for Ensuring Environmental Safety in the Kyrgyz Republic", in the Law "On Production and Consumption Wastes", in the Law "On Air Protection", in SanPiN "Noise at workplaces, in premises of residential, public buildings and in the territory of residential buildings" the Gov.KR dated 11.04.2016. №201.

5.1. Expected positive environmental impact

The positive impact consists of:

- Water losses reduction;
- Improved water resources management, consisting of construction and rehabilitation of water distribution and water-metering structures;
- Agricultural productivity increase;
- Improved soil fertility by increasing humus while applying an efficient irrigation schedules.

5.2. Potential negative environmental impact

At the same time, while executing irrigation network (re)construction works, there may be some potentially negative impacts on environmental protection conditions in the projected areas and

require attention, preventive actions and appropriate mitigation measures during planning, development, construction, operation and maintenance. While performing the planned irrigation networks rehabilitation works, no asbestos-containing materials will be used. It is necessary to mention that previously asbestos cement pipe crossings were used. But they were replaced with structures of more inert materials and, at the moment, problems with asbestos-containing materials are not expected. In the event of removal of asbestos cement pipes asbestos contained materials waste will be collected, transported and finally disposed by applying special protective measures in accordance with the hazardous waste handling standards. See Section 10 for detailed information on disposal of asbestos-containing materials. The potential negative impacts are relatively minor, and positive economic, social and environmental benefits far outweigh them in environmental assessment. Consideration of these impacts is given below.

5.3. Climate change impact

The irrigation and drainage schemes rehabilitation will enhance the agriculture and farming practices, materially-technical procurement, land owning, pastures and water management that will lead to productivity increase and adaptation to climate change and sustainable use of natural resources.

Table 2. Assessment and ranking of environmental risks

Activities	Impact	Type	Duration	Term	Degree	Risk	Reversibility	Probability
(re) Construction phase								
Construction site location	Soil contamination at a construction site as a result of storage, construction and household waste, including liquid wastes.	direct	short-term	immediate	low	low	reversible	average
	surface water and ground water contamination at a construction site, as a result of storage of construction and household waste, including liquid waste	direct	short-term	immediate or delayed	low	low	reversible	low
Unloading of excavated soil during construction of a new canal`s bed and other types of (re)construction and construction waste	landscape and animals' natural habitat degradation	direct	mid-term	immediate	low	low	reversible	average
Transportation of building materials, use of heavy machinery	air contamination and noise impacting local residents/workers during vehicles trafficking and heavy machinery	direct	mid-term	immediate	low	average	reversible	high
canals rehab	1) damaging and felling of tree-shrubbery cover; 2) excavation of soil-vegetation layer	direct	long term	immediate	high	low	reversible	high
Operation and maintenance phase								
earth-bed canals cleaning while in operation	landscape and animals' natural habitat degradation, local drainage scheme alteration	direct	mid-term	immediate	low	low	reversible	average

increase in irrigation water supply, which increases the volumes of waste water	surface water pollution with agrochemicals, as a result of excessive application of pesticides and mineral fertilizers	indirect	mid-term	delayed	moderate	moderate	reversible	average
increase in irrigation water supply that leads to water speed increase	soil erosion, related to existing agricultural production practices and landscape inclination	indirect	long-term	delayed	moderate	moderate	reversible	low

6. Environmental management and monitoring plan

All the construction phase risks are easily monitored and eliminated. They can be minimized by properly designing mitigation measures and monitoring the Contractor, while executing works. During the (re)construction works, trees felling and shrubbery cutting in a canal's alienation zone will be carried out in accordance with the requirements of the Water Code (Article 80, para. 3.) and in agreement with the specially authorized environmental protection agency/body. Excavated soil-vegetation layer will be transferred to the local authorities or WUA members to apply for agricultural purposes or/and landscape improvement. Among the O&M risks, the risk of landscape and animals' natural habitat degradation, while cleaning earth-bed canals and drains, is clear and easily controlled. In case of suspected contamination of surface and groundwater by agrochemicals, due to excessive use of pesticides and mineral fertilizers, soil erosion associated with existing practices of agricultural production, increasing groundwater table, in the zone of their deep occurrence due to excessive irrigation and, as a consequence, soil salinization, an accredited laboratory will be mobilized for special monitoring. The necessity to apply mitigation measures, during O&M, is identified exactly in the process of environmental monitoring.

7. Health and safety at work

In accordance with the KR`s legislation requirements, concerning occupational health and safety, as well as the World Bank protective policies, the EMP has developed measures to protect health and safety during the (re)construction work under the subproject, see Table 2. The regulation "Requirements for environmental protection, occupational health and safety to people involved in work and the provision of services at facilities implemented as part of the World Bank's project "Improving Agricultural Productivity and Nutrition" had been developed and approved by the PIU Director`s Order No. 8/p, dated March 16, 2018. The regulations are sent to all subcontractors involved in rehabilitation and (re)construction works under this subproject. Control over compliance with safety at a construction site will be carried out by the PIU, state control executed by the State Inspectorate of Environmental and Technical Safety under the Government of the Kyrgyz Republic.

Table 3: Mitigation plan

Фаза	Вопрос	Превентивное мероприятие /Меры по их смягчению	Cost, US $		Institutional responsibility		control
			installation	operation	installation	operation	
Construction	organizing a construction site	1) It is forbidden to locate a construction site in the water protection zones of rivers and canals; 2) Ensure removal of all waste and construction rubble from (re) construction sites to dispose on the authorized municipal landfills, with the permission of local authorities; 3) Execute planning and restoration measures to restore troubled lands during and after completing (re)construction	n/a	part of the (re)construction works contract 684 494	PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) A construction site inspections made by PIU; 3) State Ecological Inspectorate
	soil after a canal's cleaning	1) soil transportation to the designated areas, approved by the local authorities; 2) execution of rehab-design interventions	n/a		PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) A construction site inspections made by PIU; 3) State Ecological Inspectorate
	1) trees and shrubbery cover; 2) excavation of soil-vegetation layer	Coordination with the specially authorized environmental protection agency/body cutting greenery plantations that grow outside of a canal`s alienation zone transferring soil-vegetation layer to WUA or local authorities	n/a	part of the (re)construction works contract	PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) A construction site inspections made by PIU; 3) State Ecological Inspectorate
	vehicular emissions into the atmosphere	1) vehicular exhaust systems and construction equipment should be in good condition, in order to minimize air pollution; 2) Limiting the speed of vehicles and selecting suitable transportation routes to minimize dust emissions;	n/a	part of the (re)construction works contract	PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) A construction site inspections made by PIU; 3) State Ecological Inspectorate

		3) Moisturizing the road surface while driving through the residential area territories					
	noise impact within labor area	machinery and equipment operation	n/a	part of the (re)construction works contract	PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) State Ecological Inspectorate
	Workers' and rural population health and safety	1) construction sites will be equipped with information and designator boards concerning working regulations and requirements; 2) easily accessible and complete first aid kit to treat an injury. 3) ensuring personal protection equipment (helmets, protected shoes, gloves); 4) to create registry for health and safety induction and work permit.	n/a	part of the (re)construction works contract	PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) State Ecological Inspectorate 3) PIU
	safety of local population	limiting access to (re)construction sites, zones and equipment locations by local citizens.	n/a	part of the (re)construction works contract	PIU/Contractor	Contractor	1) A Contractor bears responsibility to execute environmental mitigation interventions; 2) State Ecological Inspectorate
operation	Threats to water quality due to contamination by agrochemicals	- best practices on pesticides application, - application of agrochemicals in accordance with recommended norms, - preventing effluent water discharge into canals and surface water objects,	n/a	n/a	AAS/AISP	WUA members	RSU on-site inspection, approval and coordination with SETI
	Increased of soil erosion	- outreach campaign - rational use of irrigation water and applying water regimes in accordance with the irrigation requirements, - Arrangement of irrigation furrows on the lowest slope (cross-cut furrows); - shortened furrows length;	n/a	n/a	AAS/AISP	WUA members	RSU on-site inspections

	Climate change impact	- altering irrigation technology (sprinklers, drip irrigation) - education on environmental mitigation activities; - compliance of irrigation norms and regulations.	n/a	n/a	AAS/AISP	WUA members	DWRLI

Table 4. Environmental monitoring plan

Project Phase	Parameter	Location	Method/Equipment	Frequency	Objective	Costs		Responsibility	
						Organization	Performance	organization	performance
baseline	salinity, concentration of hydrogen ions (pH), water turbidity	upper and lower reaches of canals under rehab	Field equipment for parameters measurement	At the beginning, in the middle and at the end of vegetation season	Rehabilitation works and agricultural activities impact assessment	0	Insignificant	Samples selection RSU	water sampling and analysis
construction	EMP	subprojects under rehab	visual inspection of a subproject	before, during and after (re)construction completion	ensuring implementation of planned activities under EMP	0	insignificant	subcontractor, PIU	subcontractor, PIU
	Salinity, concentration of hydrogen ions, turbidity	Canals under rehabilitation, located upstream and downstream of the rehabilitation site	Field equipment for parameters measurement	At the beginning, in the middle and at the end of vegetation season	assessment of construction works impact	0	Insignificant	RSU	water sampling and analysis. Introduction of results to PIU
	Pollution of watercourses by petroleum, oil and lubricants	Selectively for subprojects when suspected of contamination. Downstream of rehabilitation subproject	Sample for laboratory analysis	During construction	Civil works impact assessment	0	100 USD	Contractor	Accredited laboratory Water sampling and analysis. Introduction of results to PIU
operation	Salinity, concentration of hydrogen ions, turbidity	upper and lower reaches of r. Kyzyl-Suu irrigation system	Field equipment for parameters measurement	Before, during and after completion of construction	irrigation and waster waters quality control	0	Insignificant	RSU	RSU

7. Stockpiling, transportation and disposal of asbestos containing materials

Asbestos-containing materials disposal will be executed in accordance with the local legislation, including construction standards, occupational health and safety regulations, emissions of harmful substances into the atmosphere, disposal/removal of construction and hazardous wastes (in cases of a specific domestic legislation absence, the European Parliament Directive 2003/18/EU, which amends and updates the EU Directive 83/477/EEC on protection of workers against workplace exposure to hazards from asbestos and asbestos containing materials: the air pollution thresholds are 0.1 fiber/cm^3, and also use the recommended standards Notes: Asbestos: "Health problems at the workplace and in the community", the World Bank). The asbestos materials are subject to immediate unconditional disposal/entombment in special conditions.

In accordance with the Government of the Kyrgyz Republic's Order No. 885 "On Management of Hazardous Wastes in the Kyrgyz Republic, December 28, 2015," asbestos-containing wastes should be disposed the following order:

- The process of handling hazardous wastes (waste lifecycle) consists of the following stages: generation, accumulation (collection, temporary storage, stockpiling), transportation, neutralization, recycling, reuse of processed products and disposal/entombment.
- If there is asbestos on a construction site, it should be clearly marked as a hazardous material. Asbestos-containing materials should not be cut or destroyed, as this leads to dust formation. During the (re)construction, all workers should avoid crushing/destroying the asbestos-containing waste, store such waste(s) in designated areas on a construction site and properly dispose thereafter in a special place or landfill.
- When asbestos-containing wastes are to be temporarily stored at a designated area(s)/construction site, they should be properly placed in sealed containers and marked appropriately as a hazardous material. Precautions must be taken to prevent unauthorized disposal of such wastes from a designated area/site.

7.1. Storage and stockpiling

- The asbestos containing materials extraction should be minimized through the use of efficient technologies
- All asbestos containing materials should be recycled and disposed by the experienced specialists. The specialists are obliged to wear protective outfit (face masks, gloves, uniform)
- The stockpiled wastes, on a designated area(s), should not exceed established volumes/requirements.
- The access roads for removal of industrial and construction wastes from a designated area(s) should not be obstructed.
- While handling asbestos containing wastes, all operating staff members should wear protective outfit (facemask, gloves etc.). Prior to removal of asbestos waste (if necessary) the stockpiled area should be treated with a moisturizing agent to minimize emission of asbestos containing dust. Disposed asbestos should not be reused.
- Storage of inappropriate items, individual protective or working outfit is strictly prohibited at the designated asbestos waste(s) locations.
- During handling operations, all workers should strictly follow the asbestos treatment requirements, and health and safety requirements. All operations should be executed with the use of mechanized machinery, elevating and transportation equipment.
- Hazardous waste(s) should be transported by the superficially equipped Vehicles to the landfill locations, either contracted, or owned. The Vehicles should be designed and used in such a way, as to prevent possible incidents, losses and pollution of the environment, both on the way to the disposal site location, and during the (re)loading of waste from one vehicle

onto another. All types of handling and transportation of waste operations from/to the main and supporting facilities should be mechanized, and an airtight equipment used. It is strictly prohibited, during the transportation, to open the hazardous waste containers.

- Solid and dusty wastes are the subject of transportation in a specially designed containers, equipped with gripping devices for (un)loading by cranes. The transportation of asbestos wastes on the open-bed vehicles and railway cars is strictly prohibited.
- The use of hooks and other sharp tools, while processing the waste, is strictly prohibited.
- The driver of the Vehicle, transporting hazardous waste and authorized accompanying staff only, are allowed on the Vehicle(s). the Driver(s) must be aware of the safe transportation requirements.
- All handling, transportation, (un)loading and disposal of waste must be mechanized. The waste must be transported in such a way, as to prevent transport losses and impact on environment.

7.2. Disposal of asbestos containing wastes

Asbestos-containing waste must be disposed in municipal solid waste dumps or non-recyclable industrial solid waste damp-yards.

8. Legislative support

In the Kyrgyz Republic, there are a number of environmental protection laws, regulations and requirements, which address the specific issues of environmental protection. Table 5 summarizes the legal norms relevant to the subproject.

Table 5: The main subordinate legislations, regulations and requirements

Legal authority	Legal mandate
Constitution (2010)	The state's ownership of natural resources, rights and duties of citizens.
Water Code of the Kyrgyz Republic (2005)	It identifies the state policy, legislative and institutional basics on water resources management and protection
Law on environmental protection (1999)	It identifies state policy on environmental protection, legislative and institutional basics on water resources management and environmental protection
Law "General technical regulation on ensuring environmental safety in the Kyrgyz Republic" (2009)	The Regulation determines the main provisions of technical regulation in the field of environmental safety and establishes general requirements for ensuring environmental safety while designing and implementing of interventions within economic and other types of production activities, storage, transportation and production disposal.
Law on environmental expertize (1999)	It requires review of environmental protection issues (environmental appraisal) and prevents negative environmental impacts and human health as a result of economic and other activities
Law on specifically protected natural reservations (2011)	It establishes regulations for specially protected natural areas, various types and/or levels of economic activity.
Law on protection of atmosphere (1999)	It regulates emissions to atmosphere and specific obligations on protection of atmosphere
SanPin "Noise on the workplaces, in premises of residential, public buildings and	Establishes a sanitary-epidemiological requirements, standardized parameters and maximum permissible

on the territory of residential buildings" the Governmental decree of the KR, dated 11/04/2016. №201,	noise levels at (re)construction sites, noise classification, permissible noise levels in the Projected rooms, (re)construction sites, (re)constructed and operated residential, public buildings and on the territory of residential buildings.
the GovKR. Provision No.224 of 03/05/2013. "On approval of fees for calculating the amount of penalties for damages caused to objects of animal and plant life, mumijo-containing mineral materials and mushrooms by legal entities and individuals"	Fees designed to ensure preservation of biodiversity, proper protection of flora and fauna

The Government of the Kyrgyz Republic ratified multiple international conventions on environmental protection and agreements, related to this Project:

- Convention on environmental impact assessment of the transboundary territories Espoo(2001);
- Agreement on cooperation in environmental protection and efficient use of natural resources (Kyrgyz Republic, Kazakhstan, Uzbekistan) (1998),
- Convention on wetlands, representing the international importance for the waterfowls main habitat (Ramsar Convention) (2002);
- Convention on right to use international watercourses as transport routes (1997), Agreement on the use of water structures for interstate purposes on the Chu and Talas Rivers (Kyrgyz Republic and Kazakhstan) (2000);
- the United Nations Framework Convention on Climate Change (2000 г.);
- Kyoto Protocol (2003).

9. Awareness rising campaign, consultations and public attendance

9.1. Public consultations

In accordance with Operational Procedures OP4.01.[1] The WB has special requirements for disclosure of information and public consultations. The disclosure includes introduction of information about the Project affected population (PAP) and other stakeholders, from the Project's early implementation cycle, and throughout lifecycle of the Project. The information disclosure is intended to facilitate comprehensive interaction with the Project affected population, and stakeholders throughout the lifecycle of the Project. Moreover, the Kyrgyz Republic is a member of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, the United Nations Economic Commission for Europe, which also contains provisions for ensuring the disclosure of the objectives and environmental considerations of the subproject.

The Public hearings in WUA "Umetaly", Kemin rayn, Chu oblast, held after no objections by the World Bank obtained concerning the EMP, on November 22, 2018, which was attended by 38 people: WUA representatives, local authorities, farmers, WUA RSU, design engineers, PIU. The public hearings delivered a general info on the subproject, as well as technical solutions and activities that will be undertaken to prevent and mitigate impact(s). The attendees asked several questions on EMP and which was uploaded, APNIP webpage, section "Reports on environment": http://apnip.water.gov.kg/en/reports/environmental-reports/.

[1] The World Bank operational procedures 4.01, "Environmental Assessment", Para. 3.

9.2. Grievance redress mechanism (GRM)

Objective. The primary target of GRM and population's statements is identification, registry and assistance in solving complaints that were stressed during the Project activities.
The GRM main principles are:

(i) Protection of Citizens' rights;
(ii) Transparency;
(iii) Accessibility to a free GRM mechanism and without follow-up prosecution;
(iv) Appropriateness, from the point of local cultural sensitivities view;
(v) Personal responsibility for the performance duties;
(vi) Accountability of during the GRM consideration and applications by the PIU.

Complaints and applications filed in accordance with the established procedure are subject to a mandatory review, refusal to admit is not allowed. Complaints and applications of citizens, without indication of the name and postal address, to which the reply should be sent, are considered anonymous and are not subjected to revision.

The GRM does not hinder the right of citizens to applying into the Judiciary authorities. Citizens have the right to apply to the court, or other state bodies for the resolution of emerging issues related to the violation of their rights, emerged under the Project.
For the GRM implementation, the PIU and WUA created a register of complaints and statements from the population. Moreover, anyone can apply to the PIU in an online format at:
https://mail.rambler.ru/m/redirect?url=http%3A//apnip.water.kg/%25D0%25BE%25D0%25B1%25D1%2580%25D0%25B0%25D1%2589%25D0%25B5%25D0%25BD%25D0%25B8%25D1%258F-%25D0%25B8-%25D0%25B6%25D0%25B0%25D0%25BB%25D0%25BE%25D0%25B1%25D1%258B/&hash=8ef50d487d10168e5d891f2d9dd443cd

9.2.1. General GRM process

- In the process of the assets assessment, PAP will be introduced to the information concerning filing and reviewing procedure.
- The first step in the process of handling complaints will be a personal verbal appeal to the Subproject representative, AO's authority, or by phone (the mobile phone number will be provided on the information board of AO's office, and also posted in ads in places frequented by the population). If the problem cannot be resolved within 5 days, consideration of the complaint will be done at the next level.
- An aggrieved person can file a complaint on the issue related to the process of resettlement or compensation, in written from, to the PIU APNIP Director. A complaint must be signed and dated by an aggrieved party. The APNIP social affairs consultant will maintain a direct link with the PAP. The PIU will determine the validity of a complaint and notify an aggrieved person that he/she will be assisted. The answer will be provided within 14 working days, during which meetings and discussions will be held with an aggrieved person.
- If a complaint concerns an asset assessment at the expense of the Subproject, a secondary or even a third assessment of an asset will be carried forward, until it is accepted by both parties. The follow-up assessments can also be carried forward by and independent appraiser(s) at the expense of an aggrieved party. The PIU will assist to an aggrieved party at all stages to resolve a complaint and ensure that a complaint is treated the best-of-breed.
- If, after receiving a response from the PIU, an aggrieved party remains unsatisfied, then a complaint is considered in the working group of the Project under AO, which will be established by the head of AO's resolution, from the members of the Local AO deputies, WUAs representatives, local dignitaries and the PIU specialists.

- In case of an objection, regarding to the working group decision, which is provided within 30 working days, the PAP may appeal to the court.

9.2.2. Management of registered complaints

A local representative of the Subproject should ensure a weekly transfer of received complaints from the PAP to the PIU, as well as the first instance consideration result(s). The local authorities should work with complaints in accordance with the established order and should file the complaints and proposals in the processing registry. The PIU upon receipt of an information, the social consultant should ensure that each complaint has an individual identification number and a progress report in reviewing each complaint reflected in the FRP, which identifies a person(s) responsible for each individual complaint and recording the dates of the following events:

• the date of filing a complaint;
• the date of entering a Complaint(s) Registry in the Project database;
• the date when the information on the proposed solution measure(s) was sent to an aggrieved party (if applicable);
• the response date to an aggrieved party.

The general information on complaints received (number, type of complaint), progress in resolving it and problems encountered, should be included in the Subproject's periodic reporting submitted to the World Bank.

Annex 1. The minutes of Public

The minutes of Public hearings in WUA "Umetaly", Kemin rayon, Chu oblast, on environmental and social issues, as part of the World Bank project "Agricultural Productivity and Nutrition Improvement"

Alamudun AA November 22. 2018.
Attendees:

Neronova T.I. –PIU APNIP National environmental protection consultant;
Orozalieva S.M –PIU APNIP Consultant on social issues;
Shakirov U – Head of AO;
Masalbekov R – Engineer-coordinator, north, PIU APNIP;
Samsaliev K – Design-engineer, PIU, APNIP;
Muzakov N – WUA "Umetaly" Director;
Zulpukarova N. – Senior specialist of Kemin RSU.

The Public hearing was attended by 38 people: water users, farming entity representatives, farmers, WUA members, among them 9 females. The list of attendees is applied.
Masalbekov R - APNIP PIU engineering coordinator, north, and design-engineer Samsaliev K spoke about the Project "Agricultural Productivity and Nutrition Improvement\APNIP" and on-farm rehabilitation works to be executed under it.

Neronova T.I. - PIU APNIP National environmental protection consultant has explained about the APNIP project and its components, as well as Kyrgyz Republic's environmental legislation requirements and the World Bank's policy on environmental protection under the Project.
The task of environmental assessment is to identify the Project's significant impact(s) on the environment (positive and negative), identify appropriate preventive measures and mitigation measures addressed to prevent, minimize or eliminate any expected irreversible impact(s). The experience of previous projects has demonstrated the positive impact of a project on the environment. In fact, many positive impacts of projects have been identified during the environmental assessment. Namely, this Project is aimed at reducing water losses in irrigation schemes, improving water management, improving agricultural productivity and improving soil fertility.

At the same time, while carrying out civil works on reconstruction of irrigation networks, there may be some potentially negative impacts on environmental protection conditions in projected areas that need attention, to accept preventive actions and appropriate mitigation measures during planning, development, construction, operation and maintenance. Some negative impacts considered as insignificant, however economic, social and ecological benefits far outweigh them, from the environmental point of view, consideration of which delivered below. The main impact that may occur during (re)construction works:
Soil pollution on construction site
Groundwater pollution on construction site
Deterioration of the landscape, destruction of the natural habitat of the animal world, changing the local drainage network
Air pollution and impact on workers/population during traffic and heavy equipment operation
The site specific EMP is composed for each of the rehab subproject to prevent or mitigate the negative impact(s) of the civil works. It includes a mitigation and monitoring plan, both for the construction phase, and for the O&M phase. All the risks of the construction phase are easily controlled and eliminated. They can be minimized by properly designing mitigation measures and controlling the Contractor, while carrying out the works. Among the risks of O&M phase, the risk of degradation of the landscape and destruction of the animal world's natural habitat, while cleaning unlined canals and drains is obvious and easily controlled. The risks of surface and groundwater pollution by

agrochemicals, due to excessive use of pesticides and mineral fertilizers, soil erosion, associated with existing practices of agricultural production, groundwater table rising in the shallow zone due to excessive irrigation and, as a consequence, salinization of soils, require a special monitoring. The need for mitigating measures at the stage of O&M is determined precisely during the process of environmental monitoring.

Orozalieva S.M. - PIU APNIP Public affairs and social issues Consultant, delivered the message concerning social aspects under the Project to the participants of the public hearing. In particular, she spoke in detail about the World Bank policy 4.12 "Forced Resettlement", the Policy is aimed at eliminating the risks associated with involuntary resettlement, and by addressing the issues of reducing risks to a minimum. She also stressed that WUA members and councils that are the subject to rehabilitation, should be aware of their options and rights related to resettlement, and take part in consultations concerning possible options for compensation, and would have had the right to choose and be provided with technically and economically feasible alternatives for resettlement. She also noted that during the resettlement, attention should be paid on socially vulnerable population, such as ethnic minorities, female-headed households, the elderly, etc., with appropriate assistance to improve their living standards. In the interest of resettled persons, necessary and accessible mechanisms should be established to review and resolve their complaints either at the spot, or in the PIU office. Each WUA, included in the rehab program, should maintain a register of complaints and currently almost all WUAs have such a register. Moreover, all WUAs have a complaint form and GRM. The ecological and social issues were also discussed, the main goals of which are constant surveillance on public opinion, awareness raising campaign to deliver a message to the stakeholders, while under rehab and modernization of irrigation network. In addition, the PIU site (www.apnip.water.gov.kg) has a separate section on appeals and complaints, where anyone can send their appeal or complaint about the Project's activities. For effective monitoring and management of complaints of the population and GRM, the PIU maintains a database of appeals and complaints.

Questions:

Asanaliev K: - Is there anyone who will monitor ecology during (re)construction?
Neronova T: - The subcontractor is in charge for executing activities under the EMP and will appoint a responsible person. Moreover, the PIU is also will be controlling such activities, as well as SETI.
Zarlykov A: - Will noise and dust impact the local residents during (re)construction works?
Neronova T:- Such impact(s) may occur during heavy machinery transportation through residential areas only. However, the EMP includes activities to mitigate/prevent such negative consequences, and speed limit is applied.
Kurmanaliev R: - Water quality monitoring. Will that issue be monitored and water sampling taken?
Neronova T:- RSU will be executing water quality monitoring in canals. Also rapid assessment on mineralization, acid-base analysis and water turbidity.
Akmatov K: - Is permission to cut greenery required, if they are within a canal`s alienation zone?
Neronova T: - During surveying of canals it was found that some greenery within those zones. Thus, WUA has to compose the formal letter with the request to cut greenery to the Chu-Bishkek territorial environment protection department, and they will consider this issue.
Isakov C: - What is the purpose of GRM?
Orozalieva S:- The main purpose of GRM is to receive feedback(s) from stakeholders involved into the subproject, for instance; if there are some cases of non-compliance with the environmental mitigation activities during (re)construction works.
Kadirova B: - Who can apply the complaint?
Orozalieva S: - A complaint can be composed by any member of WUA or local resident. A complaint could be filled in any moment, either in verbal or written form, during preparation or implementation of the subproject.
Ozgonova A: - PAP – what does that mean?

Orozalieva S:- A person or a household affected by the subproject, either direct economic and social consequenses resulted from:
Forced land plot withdrawal that lead to relocation or loss of dwelling;
Loss of assets;
Loss of income source or livelihood, regardless of whether or not they should, affected people, move to another place;
Forced restriction of access to legally designated parks and protected areas, which leads to adverse effects on the livelihoods of displaced persons
Duysheev T: - Could you please explain what is "forced relocation"?
Orozalieva S: - Forced relocation means forced withdrawal of land plot(s) that directly or indirectly impacts economic or social conditions via:
Loss of advantages from using land plot(s);
Resettlement caused by loss of dwelling;
Loss of assets or access to them;
Loss of income source or livelihood, regardless whether PAP will be relocated;
However, under this subproject, there are no such cases that plan relocation. The subproject does its best to avoid this kinds of forced resettlement.
Baidaliev A:- Where can I compose a complaint?
Orozalieva S:- A complaint(s) will be considered in 4 stages.
1st stage - To the subproject representative appointed by local authorities (person responsible – RSU specialist), either verbally or telephonically. A complaint will be processed within 5 working days. In cases when 1st stage will not be capable to solve an issue, then it will be transferred to stage 2.
2nd stage – A written complaint (an aggrieved party), signed and dated, is sent to the PIU APNIP Director (person responsible – PIU social issues specialist). The specialist registers a complaint and assigns a registry number, studies a complaint and gives an assessment, and following consideration process and informs an aggrieved party. If the 2nd stage will not be capable to solve an issue, then it transferred to the 3rd stage.
3rd stage – A complaint is sent from the PIU to the working group of AO. At this stage a complaint will be considered during 30 days. If the 3rd stage will not be capable to solve an issue, then its sent to the stage 4.
4th stage – A complaint is sent to the court of first instance and is considered at this stage in accordance with judicial procedures. But, the PIU responds to all complaints promptly and in a timely manner, and almost all complaints are resolved locally.

At the end of the meeting, all attendees have supported implementation of the subproject and expressed their gratitude.

Chairperson:

Head of Alamudun AO	Shakirov U.
Environmental specialist	Neronova T
Social affairs specialist	Orozalieva S

Annex 2. Photo

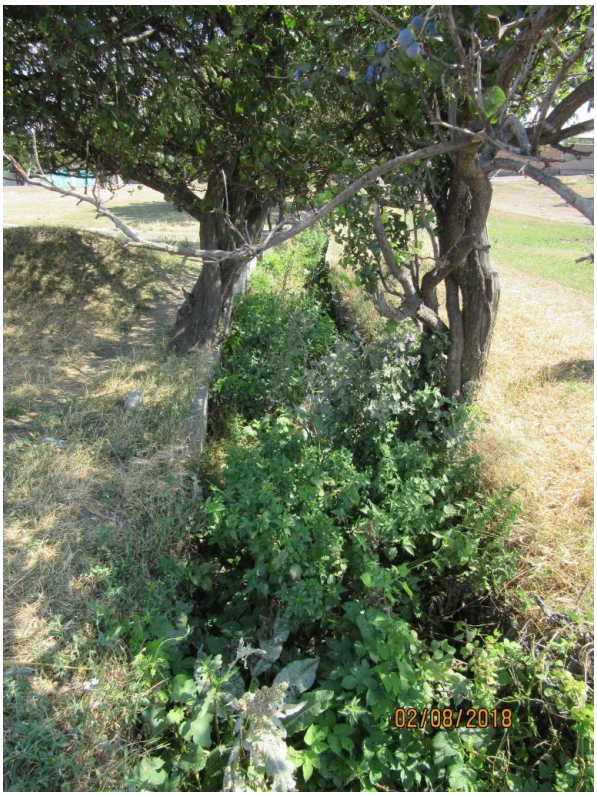

Photo 1. C-l Chechey, August 2018 Photo 2. C-l Kalmak-Suu, August 2018

Photo 3. C-l Kyzyl-Suu

Photo 4. Headwork on c-l Chechey, March 2018, (main water distribution point).

Image 5. By-pass c-l Kyzyl-Suu, March 2018

Image 6. С-l Л-1

Image 7. The Public hearing, November 22, 2018.