



**PROGRAM
OF LAND RECLAMATION AND IRRIGATION SECTOR
DEVELOPMENT IN THE REPUBLIC OF TAJIKISTAN
FOR 2016-2025**

Dushanbe - 2016

This program was prepared within the framework of the National Policy Dialogue (NPD) on integrated water resources management in Tajikistan in the framework of the EU water initiative. The basis for the work was the decision of the NPD Steering Committee to prepare a strategy for irrigation after the establishment of the Agency of Land Reclamation and Irrigation under the Government of the Republic of Tajikistan at the end of 2013.

The European Union (EU) through the UN Economic Commission for Europe (UNECE) funded the preparation of the program. A group of local experts developed the program, it included Gafarov B., Kamoliddinov A., Eshmirzoev I., Sodatsairova Sh., Nozimov S., Jalolzoda J., Bedoriev S., Rasulov G., Nazifov Sh., Kholmatov A. Yaakov Lev, UNECE consultant, provided his comments at the initial phase of the program development. Peep Mardiste, NPD regional coordinator, provided general management of behalf of the UNECE.

Table of contents

ABBREVIATIONS AND ACRONYMS	3
INTRODUCTION.....	4
1. ROLE OF LAND RECLAMATION AND IRRIGATION IN TAJIKISTAN'S NATIONAL ECONOMY	7
2. CURRENT STATE AND PROBLEMS OF LAND RECLAMATION AND IRRIGATION	8
3. LAND RECLAMATION AND IRRIGATION SYSTEM REFORM	23
4. DEVELOPMENT OF LEGISLATION AND ACHIEVING ECONOMIC SUSTAINABILITY IN THE AREA OF LAND RECLAMATION AND IRRIGATION	27
5. CAPACITY BUILDING OF ALRI AND ITS BRANCHES	Error! Bookmark not defined.
6. INVESTMENT IN LAND RECLAMATION AND IRRIGATION SECTOR DEVELOPMENT	Error! Bookmark not defined.

ABBREVIATIONS AND ACRONYMS

EU	European Union
GIZ	German Agency for International Cooperation
IDB	Islamic Development Bank
SDC	Swiss Agency for Cooperation and Development
WB	World Bank
ADB	Asian Development Bank
WUA	Water User Association
ALRI	Agency for Land Reclamation and Irrigation under the Government of the Republic of Tajikistan
DBIS	Database and Information System
LRIBM	Land Reclamation and Irrigation Basin Management
WSS	Water Supply and Sanitation
WW	Waterworks
SUE	State Unitary Enterprise
DF	Dehqan Farm
I&D	Irrigation and Drainage
IWRM	Integrated Water Resources Management
CoEP	Committee on Environment Protection
LR&I	Land Reclamation and Irrigation
ICWC	Inter-state Commission for Water-Management
MLRWR	Ministry of Land Reclamation and Water Resources (former)
MEWR	Ministry of Energy and Water Resources
NWEC	National Water and Energy Council
NCID	National Commission on Irrigation and Drainage
PS	Pump Station
IDSF	Irrigation and Drainage Service Fee
UNDP	United Nations Development Program
GoT	Government of Tajikistan
O&M	Operation and Maintenance
KMK	Khojagii Manziliyu Kommunalii (Housing and Communal Services)

INTRODUCTION

The land reclamation and irrigation sector is one of the main sectors facilitating the achievement of food security, employment of population in rural areas and thereby contributing to the economic development of agro-industrial complex of Tajikistan. Reducing poverty in rural areas is closely related to the sustainable functioning of this sector. The Government of the Republic of Tajikistan attaches priority importance to the preservation of sustainable activities in the land reclamation and irrigation, and their development.

The Decree of the President of the Republic of Tajikistan №12 “On improvement of the structure of executive bodies of the Republic of Tajikistan” of November 19, 2013, has laid down the legal foundation for the broader implementation of the water sector reform including the reform in the land reclamation and irrigation sector. This decree delegated the functions of the former Ministry of Land Reclamation and Water Resources (MLRWR) of the Republic of Tajikistan related to the land reclamation and irrigation to the newly established Agency of Land Reclamation and Irrigation (ALRI) under the Government of the Republic of Tajikistan.

The Agency of Land Reclamation and Irrigation under the Government of the Republic of Tajikistan is the central executive body in the area of land reclamation and irrigation, which exercises functions aimed at the development of the unified state policy and legal-regulatory framework in the field of land reclamation and irrigation systems, use and maintenance of the water sector facilities, supply with irrigation water, and protection of water resources.

The Agency is also responsible for the operation and maintenance of water facilities, design and construction of new hydraulic structures, reinforcement of riverbanks to prevent the risks of flooding, development of land and water supply, overseeing the reclamative condition of land and water use, management of water resources for irrigation purposes, support to the water user associations, and the establishment of the basin and sub-basin management based on the principles of the integrated water resources management.

The last two decades the current land reclamation and irrigation management system functions poorly and the irrigation and drainage infrastructure is not maintained and operated in accordance with real needs. This is particularly evident in the areas of the pumping irrigation. One of the pillars of the sustainable functioning of the land reclamation and irrigation infrastructure is the improvement of economic mechanisms in this sector. The existing economic

system cannot be considered even satisfactory, and it is urgently required to create all the conditions for a gradual transition to the sector's optimum system of financing. Given the strategic importance of land reclamation and irrigation for the country, the Government will continue supporting and contributing to the implementation of measures to achieve the objectives of the sector development.

Currently, the Government of the Republic of Tajikistan adopted the Water Sector Reform Program of the Republic of Tajikistan by its Resolution №791 of December 30, 2015.

According to this program, the basin water resources organizations and basin councils will be created in the main basins. Based on the experience of developed and developing countries, with the purpose of improving efficiency of land reclamation and irrigation management system, the water sector reform program provides for the application of the principles of the integrated water resources management and the transition of the management system from the administrative and territorial borders to the hydrological river basins. As part of the reform program it is envisaged the possibility of implementing the reform in the land reclamation and irrigation management system, in particular, the transition to basin and sub-basin management based on hydrographic boundaries of irrigation and drainage systems.

To do this at all management levels the ALRI will introduce the principle of the participation of water users or their representatives in the planning and management to improve the efficiency of water use in irrigation and drainage. Participation of all water users of basins, sub-basins and irrigation systems will be achieved through the involvement of their representatives in the activities of the relevant Advisory Councils created under the ALRI branches, as well as their participation in the activities of Basin Water Councils.

However, for the transition to hydrographic management of irrigation and drainage systems in the first phase until 2020 it is necessary to rehabilitate the irrigation and drainage systems, strengthen the material and technical base of the ALRI and WUAs, and develop economic mechanisms of profitability of the land reclamation and irrigation industry. Thereafter, it is planned to develop the program of transition to hydrographic management of land reclamation and irrigation systems.

This program of the land reclamation and irrigation sector development in Tajikistan is part of the Water Sector Reform Program of the Republic of Tajikistan and identifies ways to improve land reclamation and irrigation management in 2025 perspective. The need for its development is connected with

the deepening of the reform process in the water sector and the land reclamation and irrigation in particular. The main goal of the program is to improve the efficiency of the land reclamation and irrigation, food security and employment and reduce poverty of the rural population of the country.

1 ROLE OF LAND RECLAMATION AND IRRIGATION IN TAJIKISTAN'S NATIONAL ECONOMY

1. Irrigated agriculture has played an important role in the establishment of ancient civilizations. In the valleys of the Syrdarya, Vakhsh, Kafirnigan, Panj and Zarafshon rivers the irrigated agriculture exists for thousands of years. The large-scale development of irrigated agriculture in Tajikistan during the Soviet era and since independence has played an important role in improving food security, rural development and the transformation of agriculture into one of the main sectors of the economy of Tajikistan.
2. The largest irrigation systems of the country such as Vakhsh, Hissar, Hojabakirgan, Yavan-Obikiiyk, Dangara, Zafarabad, Matchoh, Kyzylsu-Yahsu, Asht, Lower Kafirnigan and Istaravshan form the basis of irrigated agriculture in the country. In the difficult conditions the country's mountainous terrain there were also built irrigation and drainage systems.
3. Land reclamation and irrigation in Tajikistan historically play an important role in providing employment of population, especially in rural areas, which accounts for more than 73%. According to the Statistics Agency under the President of the Republic of Tajikistan, of 2.3 million of the employed population, more than 1.5 million (66%)¹ are engaged in agriculture, hunting and services. Of the TJS 1.51 billion manufactured products TJS 1.49 billion falls on crop production and over 90% of this production is produced on irrigated land.
4. The total area of land potentially suitable for irrigation in the country is 1.573 million hectares, of which about 752.5 thousand hectares are developed. Since these lands are located mainly in the foothills, they can be developed mainly using water- and energy-saving irrigation technologies.
5. In order to ensure food security, employment and poverty reduction in rural areas, conversion of the irrigated agriculture into the developed area of agriculture, the Republic of Tajikistan will continue its efforts for the conservation and development of irrigation and drainage systems, improving provision of infrastructure with state-of-the-art and high-performance equipment allowing efficient use of water - land and energy resources.

¹ Statistics Agency under the President of the Republic of Tajikistan, 2013

2 CURRENT STATE AND PROBLEMS OF LAND RECLAMATION AND IRRIGATION

6. The irrigation infrastructure usually develops for many years, but also serves for long periods of history. Irrigation and drainage are the backbone of irrigated agriculture and food security in all countries. In case of the smooth-running maintenance and operation system of irrigation infrastructure, its reliable functioning throughout the entire period of its use is provided. In current conditions, many irrigation and drainage systems are in need of urgent rehabilitation and reconstruction.

2.1. CURRENT STATE AND PROBLEMS OF IRRIGATION INFRASTRUCTURE

7. A modern irrigation and drainage system in Tajikistan is a complex technical infrastructure, which includes hundreds of different types of water intake facilities, about 384 pumping stations of various types and capacities with 1,482 pump units with a total length of 624.67 km of pressure pipelines, irrigation canals of various sizes with total length of 29.2 thousand km, 11.4 km of drainage networks, including 2.2 thousand km of inter-farm and 9.1 thousand km of farm, 7,099 waterworks, 5,455 water distribution points, 3,858 gauging stations, 1,115 units of land reclamation, irrigation and monitoring wells, 374 transformer substations, 145.6 km of power transmission lines, 10 reservoirs for irrigation and energy purposes, over 26 km of irrigation tunnels and other supporting infrastructure².
8. Of 752.5 thousand hectares of irrigated land, about 280 thousand hectares are serviced by the pumping stations. Of these, 211.6 thousand hectares are serviced by the cascaded pumping stations built in 1950-1980s of the last century, which exceeded the service life 2-4 times. Pumping stations are physically worn out by more than 50%.
9. Of the total number of pumping stations held on the ALRI inventory, 45 pumping stations with allotted area of about 14 hectares of land are idle due to the lack of spare parts and the shortage of financial and material resources. In general, in order to achieve sustainable water supply it is necessary to replace 1,274 pumping units.
10. The technical condition of the pressure pipelines of the pumping stations, the total length of which is 620.2 km. causes a serious concern. The oldest pipes of different diameters and different materials (mainly steel) were installed in 1956-1975. It is necessary to replace almost completely the steel pipes with a diameter 1,200-1,400 mm.

² Hereinafter, the data on land reclamation and irrigation infrastructure is provided by ALRI, 2014

11. From the available 422 vertical drainage wells held on the ALRI inventory, approximately 220 are out of order (2014). They previously serviced more than 27 thousand hectares of land that currently are not being used or are in jeopardy of withdrawal from agriculture due to salinization or waterlogging. ALRI also services 33 drainage pumping stations with 127 units.
12. Reclamative condition of the irrigated land, despite the implementation of the annual autumn and winter activities on a total area of about 10 thousand hectares remains poor due to insufficient volume of these activities for the advanced improvement of the drainage system. As a result, while improving land reclamation in one place, in another place the condition is already deteriorated. As of January 1, 2015, the condition of land at the area of 35,583 hectares is poor.
13. Taking into account the cascading the ALRI pumping stations during the growing season in total pump more than 5.5 billion m³ of water and for this purpose they use about 1.3 billion KWh. of power depending on early planting. This represents about 60% of the electricity needs of pumping stations at the level of the early 90-ies of XX century.
14. Late supply of electricity in spring or its early cut-off in fall, in crop rotations at the area of about 110 thousand hectares³ leads to the losses of farmers of up to 30% of potential income from the cultivation of early vegetables and grains.
15. Currently the technical condition of the irrigation and drainage infrastructure is very poor and continues to deteriorate due to lack of sufficient funds and satisfactory procedures and standards for the implementation of regulatory measures for its operation and maintenance, due to shortcoming of economic mechanisms of the relationship between the ALRI branches - water suppliers and water users.

2.2. IRRIGATED LANDS IMPROVEMENT

16. Land reclamation is one of the most important objectives of creating a base for achieving food security of the country. In the absence of adequate land reclamation activities, the productivity of irrigated lands goes down so that all investments in land development may turn out to be inefficient. Irrigated lands need to be systematically improved to maintain sufficiently high land fertility, which is an essential condition of high crop yields.
17. Tajikistan is a mountainous country and its specific hydro-morphological conditions ensure a sufficient degree of natural drainage of irrigated lands.

³ Information of the Ministry of Agriculture of the Republic of Tajikistan, 2009

Nevertheless, such natural phenomena as water table rise, repeated salinization, waterlogging, and soil erosion in the irrigated land area can be observed on some sections in all irrigated zones of the country. According to the former MLRWR, over the past 20-25 years slightly more than 70% of all irrigated lands in Tajikistan had been in satisfactory land reclamation condition.

18. One of the indirect damages of the land irrigation is a water table rise in residential areas. There are dozens of settlements, where, because of irrigation of lands located around the water table has risen to an unacceptably high level. As a result, in residential buildings, there is a constant high humidity, in adjacent areas there are mosquitoes and the population increasingly exposed to diseases provoked by these conditions. In such areas, good work of CDS has an overall value, and it is also necessary to improve the social conditions of the local population.

2.3. OPERATION OF HYDRO-RECLAMATION SYSTEMS

19. Irrigation and drainage system operation is a set of organizational, economic, and technical activities aimed at proper management and maintenance of I&D infrastructure that ensures timely and sufficient water supply to consumers in compliance with the water use plan to promote high crop yields.
20. The activities of water management organizations - ALRI units for operation of large irrigation facilities include a variety of tasks. Many types of works are normally carried out between the points of water intake and return of discharge irrigation and drainage water into rivers or other water receivers that help ensure timely water supply in an adequate amount to various water users to satisfy different needs. Such activities specifically include:
 - Coordinated efforts at all sections of irrigation, discharge and drainage system (water intake facilities, irrigation reservoirs, during transportation of water in canals distribution of flows between water users, collection and diversion of return and drainage waters);
 - Hydro-reclamation system management;
 - Implementation of water use plan to ensure necessary in concrete environmental, climatic and meteorological conditions irrigation and drainage regime on relevant lands along with rational use of water resources;
 - Use of equipment, buildings, structures, pumping stations;
 - Repair of equipment, buildings, structures, pumping stations;

- Definition of composition, territorial distribution of care and maintenance bases, workshops, laboratories, warehouses, etc.;
- Operation and maintenance of access roads and communication facilities;
- Establishment and maintenance of areas for storage and repair of structures, preparation and updating of the list of required machinery for maintenance of equipment, maintaining necessary quantity of spare parts to replace the worn-out parts, etc.;
- Staffing of the administrative and managerial, engineering and technical, operational personnel, including the structure and fitting of the repair teams with necessary equipment;
- Increasing system efficiency through implementation of measures aimed at water saving and reduction of water losses in canals and other elements of irrigation systems;
- Monitoring of land reclamation condition of irrigated lands;
- Elimination of salinization and waterlogging of irrigated lands;
- Identification of locations of gaging stations and water quality and quantity monitoring points.

2.4. FINANCING OF LAND RECLAMATION AND IRRIGATION

21. In Soviet era, the O&M of irrigation and drainage systems were financed from the centralized state budget. With the launch of the land reform in 1996 and introduction of paid water supply from the state-owned irrigation and water supply systems, the major part of financing responsibility was placed on farmers through the collection of water supply service fees.
22. The experience of previous years showed that the implemented system ignored the reluctance and unwillingness of farmers to pay for the water supply services, as well as fragmentary interference of local administrations with the activities of district departments of land reclamation and irrigation. This leads to shortage of financing of the O&M of irrigation and drainage systems, periodic accumulation of farmers' debts to raivodkhozes and consequently raivodkhoz's debts to local units of OJSHC "Barqi Tojik" for the electricity used by the pumping stations and wells, as well as to the tax bodies, and shortage of staff wages paid through the water supply services.
23. In absolute terms, the total amount of land reclamation and irrigation subsector financing is growing from year to year, but the real economic situation in this subsector is such that a significant part of farmers' payments is made in the form of fuels and lubricants, agricultural products, sometimes

- at the price higher than in the market. Moreover, over the past decades the budgets of water organizations have always been the smallest and many types of routine and capital maintenance works have never been carried out; the staff wages have been very low. This situation led to heavy depreciation of infrastructure and unreliable operation of different elements of I&D systems.
24. It is necessary to take into account that major state capital investments are made through the loan system and grants of the key international financial institutions: the World Bank, Asian Development Bank and Islamic Development Bank. During the past 15 years the land reclamation and irrigation subsector has been supported by more than US\$200 million in the form of credits, grants, and technical assistance.
 25. De facto, to encourage a sustainable operation of gravity and pumping irrigation zones it is necessary subsequently to have 3-6 times increase in financing. For example, during the past 5-6 years the specific rates of I&D operation and maintenance financing have risen from 25 TJS up to 46 TJS/ha, whereas in the Soviet era this indicator was around 99 roubles/ha (more than US\$100 per 1 hectare). Currently, the amount of regulatory financing needs to be adjusted in consideration of specific local conditions: pumping or gravity irrigation; sub montane, mountain or valley area; distance to water intake source; areal density of settlements in the irrigation zone, etc. According to approximate estimates, at present this indicator can vary within 200-400 TJS/ha/year.
 26. One of the main operating costs items is the cost of electricity consumed. The outdated and depreciated pumping units, hydro mechanical equipment and control instrumentation of the pumping stations account for irrational electricity consumption. Though the Government of the Republic of Tajikistan has been setting reduced tariffs for pumping irrigation during the last two decades, not all farmers fully pay for the water supply services. Annually, the volume of water withdrawn by pumping stations and wells amounts to 5-6 billion m³, thereby consuming about 1.4-1.6 billion kWh of electricity.
 27. With each year, the power intensity of pumping irrigation has more ominous implications for the ALRI. It must be considered that the electricity rate in Tajikistan is one of the lowest among the CIS countries and its gradual increase will be urged by the market factors. Therefore, a prospective of preservation and development of pumping irrigation will highly depend on the share of direct and indirect subsidies provided by the Government of the Republic of Tajikistan for maintenance of jobs and promotion of satisfactory

socio-economic conditions for the population residing in the pumping irrigation zones.⁴

2.5. AVAILABLE MACHINERY AND EQUIPMENT

28. All repair and rehabilitation operations in the land reclamation and irrigation subsector require availability of core machinery and various construction and erection equipment. Of the former powerful machine and equipment stock that earlier served the irrigation and water sectors of Tajikistan⁵, there are only 171 excavators left that are currently owned and maintained by the ALRI, of which only 82 are in operating condition; 121 bulldozers, including 56 in working condition; crane trucks - 47 and 26; trucks - 337 and 87, respectively. The available machinery and equipment is about 10% of the actual demand to maintain the irrigation and drainage systems in a sustainable operating condition. Moreover, there is lack of special O&M equipment of various technical specification and capacity. There are also a lot of obsolescent and physically depreciated equipment.
29. Only one third of available machinery and equipment are relatively new, the rest had been manufactured in Soviet era and are obsolescent. Most of them consume excessive amount of fuel and lubricants and often need to be repaired. This entails a rise in the cost of repair and rehabilitation works. On the other hand, establishment of a reliable centralized system of maintenance services and spare part supply is also one of the necessary conditions of increasing the efficiency of machinery and equipment use.
30. In rural areas of Tajikistan the I&D repair and rehabilitation service system is underdeveloped, therefore in near future the major part of O&M works will have to be done by water management organizations. For the time being, this results in lower prices of execution of these works. Nevertheless, in future much of these works are expected to be implemented on a contractual basis by private repair and construction organizations.

2.6. FLOOD RISK MANAGEMENT

31. Tajikistan is a mountainous country and therefore almost the entire territory of the country is prone to mudflows and floods. In most cases, they are accompanied by substantial economic losses. The country has 947 rivers and

⁴ More than 1 million people are employed in the zone of pumping irrigation, and nearly 2.7 million persons are residing in that area.

⁵ Up to 1990 in the system of the former MLRWR there were 4,554 units of different machinery and equipment.

276 says of about 30 thousand km. long, the majority of which are prone to flooding and mudflows. These processes are more frequently are observed in the basins of the Panj, Vakhsh, Surkhob, Yakhsu, Kyzylsu, Varzob, Kafirnigan, Khanaka, Karatag and Zarafshan rivers. Damage from flooding and mudflow processes comes to hundreds of millions of TJS. One of the measures to prevent flood risk is to carry out riverbank protection works. On the Agency's balance sheet, there are 1,386.3 km of bank protection dams and 503 km of 710 mudflow flumes. Insufficient funding of the sector led to the fact that at this stage 416 km of bank protection dams and 136.5 km of mudflow flumes did not function properly by the beginning of 2011.

32. To solve this problem the Government of the Republic of Tajikistan by its Resolution № 112 of March 3, 2011 adopted the State Program "On bank protection works for 2011-2015". The main objective of this program was to carry out bank protection works, construct waterworks and other structures designed to protect the population and agricultural lands from mudflows and floods. During the implementation of the program in 2011-2015 from all sources of funding (central and local budgets, the funds collected for the water supply services and international donors' investments), 214.6 million TJS were allocated for the bank protection works, which were carried out throughout 90.15 km. This situation says about the lack of funding of the sector for the measures to prevent the risk of floods.
33. Only in 2015, due to intensive increase of air temperature the glacial melting has occurred in the basins of Panj and Vakhsh rivers, thereby triggered floods in the Gorno-Badakhshan Autonomous Oblast and Khatlon region. As a result, in the Gorno-Badakhshan Autonomous Oblast 48.8 km of bank protection dams, 105.25 km of irrigation systems are in urgent need of rehabilitation. It is also necessary to clean the beds of says from mudflows with total volume of 510,000 m³. In Khatlon region 49.37 km of bank protection dams and spurs were washed or got out of order.
34. Overall, in 2015 the damage caused by natural disasters associated with mudflows and floods for waterworks in the Gorno-Badakhshan Autonomous Oblast and Khatlon region amounted to more than 65 mln. US dollars.
35. The State Unitary Enterprise "Selezaschita" functions in the ALRI to carry out works on flood risk prevention. However, this organization is not equipped with modern equipment and machinery. In this regard, it is necessary to strengthen the material-technical base and enhance the capacity of the State Unitary Enterprise "Selezaschita" and equip with heavy machinery, vehicles and mechanisms for risk prevention and control of disasters related to the occurrence of landslides and floods.

2.7. OPERATING STAFF

36. Qualified and experienced personnel with adequate special skills and knowledge are fundamental to successful operation of any organization. During 2000-2013, the number of employees of the former MLRWR - currently the ALRI – reduced from 8,233 to 6,828 persons. However, qualified staff turnover, inadequate knowledge and experience of employees remain a challenge that has to be urgently addressed. Personnel advanced training is extremely needed everywhere.
37. In addition to qualified personnel loss, one of the other problems of the ALRI is to promote attractiveness of employment within its field units. Financial and moral incentives are essential to increasing the attractiveness of such jobs and this problem also has to be addressed. These issues should be part of the ALRI routine activities.
38. It would be useful to scale up and strengthen the water sector staff in-service training system within the relevant range of specialties under the ALRI State Enterprise “Staff Training Center”. The main higher education institutions that train personnel for the water sector are hydrotechnical melioration faculty of the Tajik Agrarian University and the Tajik Technical University. The ALRI should establish the efficient cooperation with these higher education facilities with the view of arranging advanced training of its staff and training of new personnel.
39. The key incentive to improve the quality of water supply services is to guarantee decent remuneration and financial incentives. It is important that relevant steps are taken to achieve conformity of sector staff minimum wage rate with a living wage established for large rural families. The water supply service fees and state budget funds are the main sources of employee remuneration in the sector. The aggregate wage rate was increasing in compliance with the resolutions of the Government of the Republic of Tajikistan, as well as in line with the water supply rate growth and subsequent increase in the water fee collection.
40. The current wage rate in the sector remains low and amounts to 491.00 TJS/month on average. It does not encourage sector personnel to improve the quality of service provision and promote rational use of material resources, electricity, and other resources required for quality operation and maintenance of irrigation and drainage facilities.

2.8. OPERATION OF FARM IRRIGATION AND COLLECTOR-DRAINAGE NETWORK OF WATER USER ASSOCIATIONS

41. One of the most important conditions of high crop yields is a reliable operation of in-farm irrigation and collector-drainage network. Currently, a concept of in-farm irrigation and collector-drainage network refers to a zone that covers the territory of former collective and state farms (kolkhozes and

sovkhozes). However, the implementation of land reform and farm restructuring caused many kolkhozes and sovkhozes to break up into numerous small farms and this concept is now used in the command zone of Water User Associations (WUAs) and individual farms not associated with WUA.

42. In-farm irrigation systems include 23.1 thousand km of irrigation network and 9.1 km of drainage network, 299 pumping stations, and 713 irrigation and drainage wells. The technical condition of in-farm irrigation and collector-drainage network determines the land reclamation condition and fertility of irrigated lands. It has to be noted that in most cases the in-farm irrigation network has no concrete lining, therefore the water losses in this network account for no less than 20%. Furrow irrigation also entails water losses, which exceed the same in the inter-farm network.
43. Operation of in-farm irrigation system includes preparation of irrigation equipment and stock, guidance of sprinkler operators, routine and major repairs of canals, structures, pumping stations and wells, cleaning of canals and drains from sediment load and overgrowing, irrigated land grading, staking of temporal irrigation network, drafting of in-farm water consumption management plan, distribution of water between water users according to this plan, irrigation control, metering of water supplied to water users and received from the ALRI units at the border points of WUA and individual farms, implementation of reforestation activities, land salinization and waterlogging control and other types of works facilitating sustainable operation of in-farm collector and drainage network to receive high crop yields.
44. The land reform reorganized collective and state farms (kolkhozes and sovkhozes) into numerous small dehqan farms without retention of O&M service for irrigation and collector-drainage network and relevant infrastructure. As a result, the technical condition of in-farm systems has considerably deteriorated. To renew the O&M service at the in-farm level a voluntary union of farmers will be required to ensure relevant cost financing. Such unions of farmers started to be organized in the form of Water User Associations in early 2000, however, until now their activities have proved to be unstable since they do not own any basic assets and in order to assess them a thorough assets inventory will be required using approved methodology.
45. Water User Associations (WUAs)⁶ in Tajikistan are the only specialized NGOs that have a right⁷ to manage water resources at the in-farm level, operate and maintain irrigation and other water systems at the local level

⁶ Water users would be able to establish water user associations both for joint irrigation of lands and water supply of their localities.

⁷ This right is guaranteed by the Law of the Republic of Tajikistan "On Water User Associations" adopted in 2006.

(farms). They are engaged in equitable, efficient, and timely distribution of water between their members and other water users, collection of water service fees, resolution of disputes arising between the members and other water users. WUAs can establish Federations of WUAs with the view of improving the efficiency of in-farm systems maintenance and water management. By early 2016, 417 WUAs have been established in the country with a total command area of about 403.84 thousand ha mainly in the zone of gravity irrigation.

46. WUAs interact with the ALRI units – state water service provision organizations in the field. According to the Resolution of the Government of the Republic of Tajikistan No.755 of December 2, 2014, the Agency for Land Reclamation and Irrigation was authorized to act as a state authorized agency responsible for regulation and state support of WUAs. The design of activities related to reform implementation should include a detailed description of the state and other support expected to be provided to water user associations.
47. At present, WUAs are in the stage of development; therefore, there is no urgent need for them to establish Federations of WUAs. It is clear that Federations will be actually needed when WUAs are established in all irrigation zones and become sustainable and independent organizations. Farmers will really need the support of WUAs and their Federations and will actively pay for their services.

2.9. IRRIGATION OF NEW LANDS

48. Increasing the level of the country's self-sufficiency with food products and strengthening of its export potential through cultivation of high-yielding crops and expansion of processing facilities is a strategic objective of the country's agro-industrial complex development. Irrigated cropping is fundamental to the development of agriculture in Tajikistan.
49. With population of 8.2 million, specific irrigated area per capita is 0.09 ha, which is half as much than in neighboring Uzbekistan and four times less than in Turkmenistan. At the same time, development of Tajikistan's economy and efficient addressing of social problems in a densely populated country highly depend on intensive use of land and water resources. Generally, the country is short of land resources in the presence of abundant water resources. It is expected that by 2025 the specific area of irrigated lands will be reduced to 0.08 ha/pers. In view of partial salinity of irrigated lands, inadmissibly high level of underground water, problems of the pumping irrigation, irrigated land allotment for construction of various civil and industrial projects, by 2030 the actual specific irrigated area may be reduced to 0.06 ha/pers.

50. According to expert estimates, in conditions of Tajikistan, to implement large new land development projects, including construction of relevant infrastructure, specific capital investments in the amount of 15-75 thousand TJS/ha will be required depending on lay of land complexity and/or location of water sources, as well as the irrigation technology and equipment used. For example, development of 1,750 ha of new lands in Dangara within 3 years was expected to be financed at the amount of more than 137 million TJS (IDB)⁸. The MLRWR (currently the ALRI), under much less capital investments⁹ (2,374 TJS/ha) developed around 4.8 thousand ha of new land. However, in such cases, only major facilities (main water intake and supply canal) are normally constructed, whereas construction of all relevant irrigation infrastructures (distribution I&D network, roads, flow-metering stations, operational space, etc.) is usually rest on farmers who are going to farm in this area. This is related to shortage of centralized funds and other target investments. For this reason, the least capital-intensive land areas are generally selected for development.
51. The estimates related to achievement of food security in the country under high crop yields also indicate that increase of the existing land productivity should be accompanied by a significant increase in the pace of new land development. It is practical to create an appropriate enabling environment for local communities and farmers, who want to develop on their own the fallow lands, which do not require large capital investments.

2.10. MODERN MANAGEMENT INSTITUTIONS

52. The Agency for Land Reclamation and Irrigation (ALRI) was established in compliance with the Order of the President of the Republic of Tajikistan №12 “On improvement of the structure of executive authorities of the Republic of Tajikistan” of November 19, 2013.
53. Subordinate units in all districts, regions and on a central level represent the ALRI’s existing administrative-territorial management structure. Design, specialized construction and installation organizations represent non-commercial units of the ALRI.

⁸ The costs also include rehabilitation of existing main canals.

⁹ Data from the MLRWR for 2003-2008.

Government of the Republic of Tajikistan

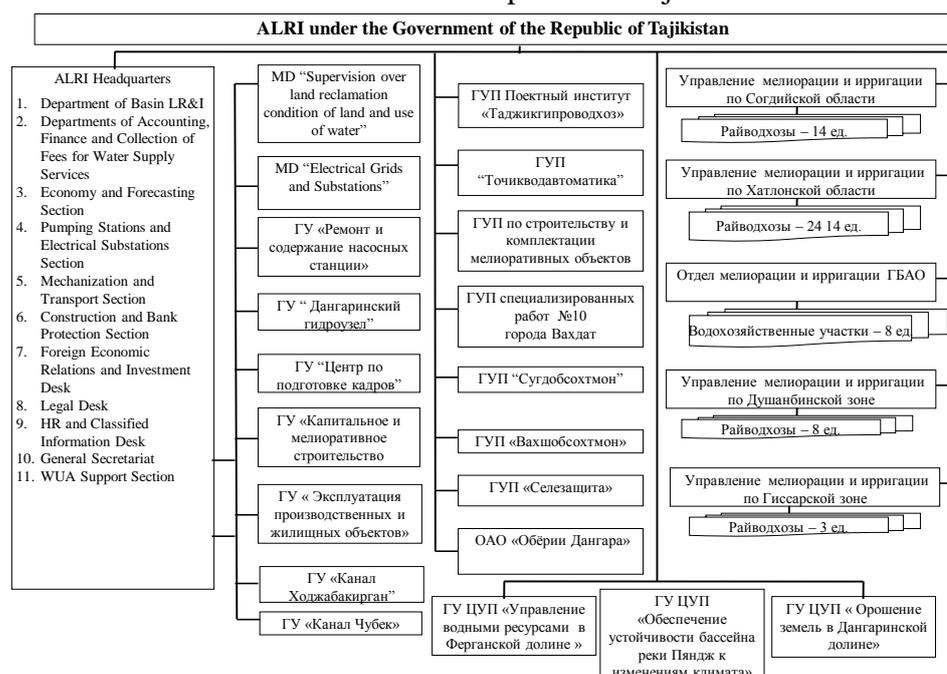


Figure 1. Overall management structure of operation of the ALRI hydro-reclamation systems.

54. Historically, the most advanced water infrastructure in rural areas (compared to water supply infrastructure) is the irrigation and drainage infrastructure. Under these conditions, irrigation and drainage infrastructure is used comprehensively for the purposes of irrigation and drainage; partly for the water supply of the population; animal husbandry and poultry farming; small hydropower; rural industry; preservation and improvement of the local ecosystems.
55. However, the experience of recent years shows that the administrative-territorial management structure of land reclamation and irrigation is worn out and in a market economy functions inefficiently, which is expressed in the ineffectiveness of its economic model, periodic accumulation of debt, the complexity of planning of the irrigation water use and drainage water control, introduction of economic management of land reclamation and irrigation.

2.11. MODERN LAND RECLAMATION AND IRRIGATION CHALLENGES

56. During the period of independence, The Government of the Republic of Tajikistan faced significant changes in its agricultural policy and economy, which had some qualitative and quantitative impacts on implemented activities related to irrigation and drainage operations. However, the issue of radical improvement of the IDS operation and sustainability still remains

vital. As a result of excessive physical depreciation of infrastructure, system failures began to occur quite often, with increased challenges to system management. With establishment of more effective management structures, it is necessary to carry out large-scale rehabilitation works. Currently the main land reclamation and irrigation challenges are as follows:

- Deterioration and the need for rehabilitation and modernization of IDS, especially in the pumping irrigation area;
- Improvement of LR&I financing system, with financing of expenses for O&M of irrigation and drainage systems to be included as an integral part of circulating capital of agricultural production;
- Lack of efficient LR&I systems maintenance and the need for improvement of LR&I service provision standards; conducting of an overall inventory of the technical state of water infrastructure;
- The need to review the system of mineralization and ground water control with the view of further prevention of salinization and waterlogging of irrigated lands;
- Shortcomings of the existing system of standardization of pumping station equipment, introduction of evaluation and adjustment criteria to increase the efficiency of operation of such stations;
- The need for implementation of efficient and transparent procurement process for compatible and standardized pumping station spare parts for their repair and other rehabilitation works;
- The need for implementation of efficient and transparent systems of research, design, supervision of works and other consulting activities;
- Low efficiency of monitoring of the technical state of Agency's infrastructure for medium- and long-term planning of works on its rehabilitation, reconstruction and modernization;
- The need to scale up activities aimed at the development of new irrigated lands in line with the demographic processes and in response to challenges necessitating improvement of the country's food security;
- Introduction of new irrigation technologies aimed at protection and conservation of water and land resources;
- Lack of sectoral energy-saving programs and introduction of energy-saving equipment in pumping irrigation, as well as partial transition from pumping to gravity irrigation;

- Conducting targeted scientific research studies to create an economically viable model of pumping irrigation for different natural and climatic zones of Tajikistan;
 - Reform of the management institutions of the Agency – transition from administrative-territorial IDS management to hydrographical management within the boundaries of irrigation systems, sub-basin and basin level units of the ALRI;
 - The need for establishing a system providing for water user involvement in the development and implementation of water planning and management decisions in the command area of I&D systems, establishment of Consulting Centers to encourage participation of representatives of water users and WUAs in their work under the irrigation system, sub-basin and basin level units of the Agency;
 - The need for renewal and development of staff advanced training system, training of young specialists oriented at present-day terms of governance and management.
57. Adequate response to all of the above-mentioned challenges in terms of the current Agency's capacity is a very difficult task, which will require a lot of funds and time. Therefore, the LR&I management system should be developed gradually, starting with the first-priority and actually feasible tasks that will help to increase the efficiency of use of land, water and energy resources, sustainability of land reclamation and irrigation infrastructure, timely and good supply of irrigation water for irrigation agriculture, economic growth and well-being of rural population.

3 LAND RECLAMATION AND IRRIGATION SYSTEM REFORM

58. Irrigation and drainage sector is the largest player in the country's agribusiness and the basis of food and other agricultural crop production. Irrigation infrastructure has extensive coverage and satisfies the needs of various industries in rural and suburban areas of the country. The socio-economic situation of about 6 million rural population¹⁰, food security and environmental condition in the area of irrigated agriculture depends on the stable functioning of the land reclamation and irrigation system.
59. The accumulated problems of land reclamation and irrigation sector, low efficiency and unstable economic basis for the sector highlight the need for appropriate reforms. The Government of the Republic of Tajikistan attaches great importance to improving the structure and the management efficiency of land reclamation and irrigation. The decision on the water sector reform was made within the framework of the overall objectives of the Resolution of the Government of the Republic of Tajikistan № 406 of July 2, 2009 "On measures to implement the Decree of the President of the Republic of Tajikistan № 663 of July 2, 2009 "On additional measures to support agriculture in the Republic of Tajikistan"". In accordance with this, the Government of the Republic of Tajikistan on December 30, 2015 adopted the Resolution № 791 on the Water sector reform program of the Republic of Tajikistan.
60. The objective of this reform is the *"Planning, development and efficient management of the water sector in accordance with a reasonable policy, analysis and joint management of the volumes and quality of groundwater and surface water, balanced use of water by various sub-sectors through the basin approach and hydro-graphic systems as the control zones in the interest of the high-level economic development of the Republic of Tajikistan on the basis of justice, equality and undiminished environmental sustainability."*
61. Given that over 90% of water resources is consumed by agriculture, as part of the reform of in the water sector the irrigation sector reform will be considered in the future as the main priority.
62. The main objective of land reclamation and irrigation reform: to improve management efficiency and stabilize the operation of irrigation systems, to ensure sustainable financing of land reclamation and irrigation, and create

¹⁰ According to the information of the Statistics Agency under the President of the Republic of Tajikistan as of January 1, 2014 the rural population of the Republic of Tajikistan amounted to 5,990.2 thousand people. www.stat.tj

conditions for water users to participate in the process of preparation and making decisions by the land reclamation and irrigation agencies.

63. In accordance with the basic principles of the reform of the water sector, being responsible for the services in irrigation and land reclamation, ALRI will implement at the sub-sector level the policy and programs for efficient use of irrigation water, and prevention of excess use and shortage of water by introducing water saving technologies and reducing losses of water, operation and maintenance of irrigation and drainage infrastructure.
64. In the context of the water sector reform ALRI can change over to IWRM and basin management, carry out irrigation and land reclamation subsector reform. This reform may introduce irrigation systems management at the level of basins, sub-basins and irrigation systems themselves, in cooperation with the WUA and WUA Federations, which would correspond to the basic principles of the reform of the water sector
65. In view of the reform of the water sector in the land reclamation and irrigation sub-sector, ALRI will be responsible for the following roles and tasks:
 - formation of the sub-sector goals, targets and strategies for efficient use of irrigation water, prevention of the excess use and shortage of water;
 - preparation of strategies and mechanisms for the protection of the quality and volume of irrigation water;
 - preparation of target programs taking into account social and economic value of irrigation water, with the introduction of cost recovery systems on irrigation and drainage services;
 - environmental sustainability at rationing, design, construction and use of irrigation infrastructure development projects;
 - implementation of the requirements of a basin IWRM plan within the command areas of irrigation systems in coordination with the organizations concerned;
 - carrying out research and test and innovative work, as well as designing in the field of land reclamation and irrigation;
 - participation and contribution to the development and implementation of the Water Code and other relevant laws, especially related to the irrigation sub-sector.

66. The reform of land reclamation and irrigation is a comprehensive and long-term process, and includes the following key activities:
- Improving the legal framework of land reclamation and irrigation;
 - Institutional reform of the land reclamation and irrigation management;
 - Rehabilitation and modernization of irrigation and drainage infrastructure;
 - Improving the operation and maintenance system at the level of tertiary (in-farm) canals and the further development of WUAs;
 - Increase the capacity of organizations and human resources capacity of land reclamation and irrigation.

3.1. LINKAGE OF LAND RECLAMATION AND IRRIGATION WITH IWRM

67. The I&D systems are the largest elements of a unified water industry of the country. The LR&I infrastructure covers the area of about 750 thousand ha and supplies water to different sectors of economy, specifically in rural areas for irrigation and drainage, domestic water supply, industry, recreation, small hydropower sector and for implementation of environmental protection activities. The Integrated Water Resources Management (IWRM) system has to be implemented in IDS service area to ensure coordination and well-balanced water supply of various water users.
68. ALRI will comply with the IWRM principles in the framework of the established requirements of the IWRM Basin Plans (IWRM BP). IWRM BP is developed jointly with all stakeholders active within the boundaries of a particular river basin. IWRM BP also determines the amount of water taken for land reclamation and irrigation out of natural water sources. In addition, IWRM BP defines the limits of fluctuations of recurrent drainage water into natural sources. Within the I&D systems ALRI delivers and distributes water to consumers, in accordance with the water intake limits, permits for special water use and signed contracts for water supply specified in the IWRM BP.
69. The transition to basin management imposes on ALRI additional tasks to actively participate in the activities and meetings of the Coordination Council under the Government of the Republic of Tajikistan on Water and Energy, National Policy Dialogues on IWRM, river basin councils, river basin dialogues on IWRM.
70. The introduction of IWRM and compliance with its requirements within the I&D systems is a great challenge and ALRI in this issue interacts with key

state authorized and executive bodies at the central and local levels: MEWR, CoEP, MDG, KMK and local administrations.



Figure 2. Approved borders for river basin and sub-basin water resources management, including main irrigation and drainage systems.

4 DEVELOPMENT OF LEGISLATION AND ACHIEVING ECONOMIC SUSTAINABILITY IN THE AREA OF LAND RECLAMATION AND IRRIGATION

71. The Water Code and the Law on Water Users Associations are the basis of current water legislation in the field of land reclamation and irrigation. In addition, the specific areas in the field of land reclamation and irrigation are regulated by other laws, such as the Law on hydraulic structures safety, the Law on dehqan farms, the Land Code, the Law on Environment Protection. Relations in the field of land reclamation and irrigation are also regulated by many other legislative acts. The changed economic conditions and the development of society currently require a more effective legal regulation in land reclamation and irrigation.
72. The development of water legislation to date has been a gradual process, mainly a response to changes in the economy and society. This led to a large number of amendments to the Water Code. Last amendments made in April 2012 contain references to IWRM, river basin management and public participation. However, various other requirements necessary for the reform, such as creating conditions for the introduction of economic instruments allowing managing resources better, are not yet included. Moreover, the various amendments made were not always consistent and really sought-after.
73. The Law on Water Users Associations regulates the procedure of organization, activity, and management of water users associations as non-profit organizations for operation and maintenance of in-farm irrigation systems in the public interest. In the future, it will be necessary to clarify this for the purpose of transition to market relations in land reclamation and irrigation at the level of in-farm irrigation systems in the Law on WUAs, the relevant rules, guidelines, and procedures for its implementation.
74. The issues of the safety of hydraulic structures of land reclamation and irrigation (dams, water intake, spillway and water discharge facilities; tunnels, canals, pumping stations, bank protection structures; scour protection devices on canals, other facilities for use and protection of water resources and prevention of negative impact of water) are regulated by the Law on the hydraulic structures safety. ALRI and other owners of irrigation and drainage systems in the issues of maintenance and improvement of safety of hydraulic structures will cooperate with the relevant departments of the MEWR.
75. The Law on dehqan farms regulates individual issues of use of irrigated lands and reclamation by farmers - land users. In addition, the Law on environment protection regulates environmental aspects of land reclamation and irrigation, addresses issues of protection of reclamation condition of irrigated lands, management of irrigation and drainage runoffs, protection and prevention of

pollution of surface and underground water, their rational use and protection of the environment as a whole.

76. There is a list of standards, requirement criteria, rules, specifications, instructions, guidelines, regulations and other instruments developed in the Soviet era and the present. Documents developed in the Soviet era need to be clarified and / or legitimized. There is also a need to develop new by-laws regulating the issues of transition to market relations in land reclamation and irrigation, land reform, and in connection with the changes in the structure, functions of management institutions in the context of integrated water resources management.
77. Further development of water legislation will be associated with different amendments to various laws and regulations of the Republic of Tajikistan. However, the experience of recent decades shows that it is necessary to develop a separate law on the regulation of land reclamation and irrigation industry. This will allow regulating in more details all aspects of relations in the society and economy associated with the land reclamation and irrigation.
78. The potential Law of the Republic of Tajikistan :”On land reclamation and irrigation" will establish the legal basis for the activities in the field of land reclamation and irrigation, define the powers of the Government of Tajikistan, the authorized state body in the field of land reclamation and irrigation, local administrations, as well as the rights and responsibilities of natural and legal persons carrying out activities in this area and ensuring the efficient use and protection of the reclaimed land, land reclamation and irrigation systems. It will define the priorities of the state policy in the sphere of development of productive capacities related to land reclamation and irrigation.
79. It is expected that the draft Law will have a regulatory nature. The sectors of responsibility of state bodies and NGOs (WUAs) will be identified. The economic mechanisms of funding of activities on land reclamation and irrigation systems will be also determined for the sustainability of their operation. The rules of carrying out the land reclamation activities and the operation of land reclamation and irrigation systems will be defined. It will include provisions on controlling condition of the reclaimed land, reclamation and irrigation systems and other hydraulic structures, as well as avoiding the disposal of reclaimed land from agricultural use, and the inclusion of new lands for agricultural purpose into rotation, and development of new lands. The rules of conduct for operating organizations (Raivodkhoz) and water users (WUAs) will be specified. The mechanism of state control over reclamation condition of land and the responsibility for the violation of the law will be also defined.

4.1. ACHIEVING ECONOMIC SUSTAINABILITY OF LAND RECLAMATION AND IRRIGATION MANAGEMENT

80. The main economic instrument that will guide the Agency is reimbursement of water supply costs according to the established rates. However, this mechanism is expected to work only in conditions of free tariff regulation and application of a well-balanced economic approach by the government, taking account the I&D subsector interests. In terms of antimonopoly market regulation, part of expenses for O&M of IDS shall be covered from the state budget. The Government of the Republic of Tajikistan is attracting substantial investments from various internal and external sources for rehabilitation and modernization of I&D infrastructure, development of new lands and achievement of other objectives of national and economic importance for the country's development. All the related priorities shall be identified by the Government of the Republic of Tajikistan.
81. In the short run, the donor financing and financing of market economy nature can be used to fill the gap in the new investments, but in the long-run, the water sector is expected to be rehabilitated through the recoupage of capital investment. The international experience shows that it is not possible to cover fully all expenses of agriculture from own revenues of the industry. This also concerns the land reclamation and irrigation industry. Subsidizing of agriculture including part of the costs for O&M of LR&I infrastructure, is exercised in almost all developed and developing countries. It is clear that in Tajikistan there is a need to improve a targeted subsidizing of some part of costs of land reclamation and irrigation. At the current phase of the reform, all activities should be focused on improvement of economic foundations for sustainable operation of LR&I system with the support of the Government of the Republic of Tajikistan.
82. At present, the main issue requiring the urgent solution is to develop a sustainable economic mechanism for the operation of LR&I subsector and its adaptation to a developing market system in Tajikistan. It implies that in the long-run, the revenues of the water management organizations from the water supply service provision should be sufficient to recover the costs of management, O&M, rehabilitation and replacement of depreciated infrastructure.
83. Overall cost recovery in LR&I subsector can be achieved only through the gradual implementation of such principles as "consumer pays" and "polluter pays" at all levels. Indeed, this depends on the revenues of water users using water for economic and other purposes. The Government also contributes to this process by providing the farmers with a freedom to choose agricultural crops for cultivation and the freedom to select a market, strongly supporting the private sector in view of the measures aimed at implementation of public

administration reform strategy and wide reform agenda in agriculture and water sectors initiated in 2009 (the Order of the President of the RT № 1713).

84. The following steps need to be undertaken to increase the economic sustainability of LR&I system:

- Deblocking of undesirable sustainable cycle¹¹: inefficient management and ineffective financial mechanism - provision of poor quality water supply services – accumulation of farmers’ debts – shortage of funds in LR&I subsector – decrease in the quality of O&M works in LR&I subsector;
- Renewal and development of water metering system using modern means, prevention of water metering distortions in the field;
- Establishment of effective economic mechanism of financing O&M of IDS based on actual needs to prevent the infrastructure depreciation and a decrease in the quality of service provision;
- Use of fines for excessive water use and pollution;
- Development of agro-service in irrigated agriculture, provision of better access of farmers to credits and markets, increasing farmer income and building the capacity to invest in sustainable operation of irrigation complex. The on-going reform in agriculture will provide a possibility to efficiently address these problems.
- Improvement of methodology for calculation of differentiated rates for water supply, collection and diversion of drainage water based on officially substantiated water consumption plans;
- Improvement of methodology for calculation of membership fees for WUAs, taking into account the cost of services provided by water supply organizations and internal cost of O&M by WUAs within their command areas;
- Improvement of mechanism regulating financial relations between district-level state LR&I departments and WUAs;
- Improvement of a transparent mechanism of government subsidizing in general with a focus on pumped water lifting at the height of up to 100 m and more;
- Making special emphasis on improvement of fallow, saline and waterlogged gravity-irrigated lands, as well as those which are prone to these processes, as an alternative to new land development requiring pumped water lifting;

¹¹ The key condition to ensuring sustainability of irrigated cropping system is to establish an efficient economic system of agriculture in general. Then and only then water users would be able to pay in full for the water supply as per the established rates.

- Establishment of a specialized land reclamation fund to be used for financing of LR&I activities.
 - Development of new lands requiring pumped water lifting at the height of 100 m and more with compulsory inclusion into projects of a requirement for implementation of water-saving and soil-conservation technologies; improvement of existing irrigation technologies combined with cultivation of high-yielding crops in demand in the market;
 - Creating a system of tax benefits to encourage application of water-saving technologies (drip and drip-furrow irrigation, micro-sprinkling, automation of water distribution systems and other technologies), especially in the pumping irrigation command area;
 - Development and implementation of mechanisms of incentives encouraging the community and farmers to invest in improvement of I&D networks.
85. Though many of the above-mentioned activities are of technical and organizational nature, they can positively affect the improvement of economic conditions for efficient operation of LR&I systems and lay a solid foundation for renewal of financial stability in LR&I subsector and agricultural production development.

4.2. NATIONAL COMMISSION ON IRRIGATION AND DRAINAGE

86. The National Commission on Irrigation and Drainage (NCID) was established by the Resolution of the Government of the Republic of Tajikistan № 620 of October 29, 2015. The main purpose of the NCID is the effective facilitation to implementation of a unified state water policy aimed at the development of land reclamation and irrigation sector, the rational use and protection of water resources, land reclamation and improve productivity of irrigated land, the introduction of advanced irrigation technologies, ensuring the sustainable development of agricultural production, in conjunction with development and implementation of measures to improve water resources management taking into account the reform of the water sector, flood control, regulation of riverbeds and the economic recovery of the natural environment.
87. The NCID objectives are as follows:
- assistance in the development of land reclamation and irrigation industry using advanced scientific and technological achievements;
 - assistance in the formulation and drafting of policies, strategies, programs and development plans for the water sector;
 - identifying and addressing issues of water management, modernization of existing water facilities and irrigation systems;
 - assistance in improving land reclamation and irrigation management

systems, technical and economic pillars of sustainable functioning of the sector;

- coordination of common interests of economic sectors in the field of irrigation and drainage, improvement of water resources management in irrigated areas, regulation and government support of the water users' associations, reduction of the harmful effects of water on the environment;
- improving the knowledge of experts and water users in the field of land reclamation and irrigation, rational and efficient use of water and land resources in the areas of irrigation;
- attracting grants and loans to improve the land reclamation and irrigation industry, as well as for NCID activities.

88. Also NCID will cooperate with international organizations in the following areas:

- preparation and implementation of investment projects, scientific and technical cooperation for the development of land reclamation and irrigation sector;
- facilitation in the organization of a database and information about successful projects implemented by international organizations in the country in the field of land reclamation and irrigation and water resources management in irrigated areas;
- dissemination of best practices of foreign countries in the field of land reclamation and irrigation through the exchange of scientific and technical information;
- cooperation with international and non-governmental organizations in the implementation of NCID activities.

5 CAPACITY BUILDING OF ALRI AND ITS BRANCHES

89. The outflow of highly skilled professionals of the reclamation and irrigation industry during the past decades was not yet offset by the attraction of highly qualified specialists of the new generation. So far, the adequate mechanisms of motivation were not established yet. Therefore, capacity building of employees and increase of capacities of ALRI units is essential to ensure sustainable operation of the land reclamation and irrigation system. As part of the reform, it will be necessary to develop a special program to improve the capacity of ALRI and its units.
90. The main directions of improving capacity in the next 5-10 years should cover the following areas:
 - Upgrading the skills of the ALRI management on the central and basin levels: training in the country and in the countries with developed land reclamation and irrigation systems;
 - Upgrading the skills of engineering and technical staff of land reclamation and irrigation systems in the gravity irrigation zone;
 - Upgrading the skills of engineering and technical staff of land reclamation and irrigation systems in the pumping irrigation area;
 - Equipping ALRI offices with appropriate equipment to improve the management and planning conditions.
91. Improving ALRI capacity should contribute to the qualitative and timely management and sustainability of the LR&I system in the country.

5.1. ALRI DATABASE AND INFORMATION SYSTEM

92. ALRI will create the Database and Irrigation and Drainage and Information System (DI&DIS). It will be integrated with the national DBIS to be managed by the MEWR. The Agency will determine the level of user access based on agreed-upon rules for the use of the national IWRM Database and Information System of Tajikistan.

6 INVESTMENT IN LAND RECLAMATION AND IRRIGATION SECTOR DEVELOPMENT

93. The development of the LR&I sector will require certain expenditures related to infrastructure rehabilitation and modernization and improving capacity in the system of land reclamation and irrigation management. The ALRI and its basin, sub-basin and system level units will need to be provided with necessary equipment and machinery and their capacity in the field of management and customer servicing will also need to be strengthened.
94. Rehabilitation and modernization of land reclamation and irrigation infrastructure is an ongoing process and the amount of their cost can be determined approximately on the basis of already approved and planned projects supported by international partners of the Government of the Republic of Tajikistan including the World Bank (WB), Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), Islamic Development Bank (IDB), Swiss Agency for Development and Cooperation (SDC), United Nations Development Programme, Food and Agriculture organization (FAO), German Society for International Cooperation (GIZ) and other international and financial institutions. Improved infrastructure will lead to sustainable servicing of water users and increase in the collection of fee payments for water supply services, increase in the efficiency in the reclamation and irrigation systems, and reduction of the level of mineralization of groundwater, increasing productivity in irrigated agriculture, thereby achieving food security in the country.
95. In 2015, the total amount of ongoing and planned projects invested by the international partners of the Republic of Tajikistan (in the form of grants and concessional loans) in the water sector for 2015-2020 makes more than 153.7 million USD. The bulk of these investments will be spent on the rehabilitation and modernization of irrigation and drainage infrastructure, as well as on the implementation of water sector reforms, including the improvement of land reclamation and irrigation management system. The detailed information on the costs of specific activities is provided in the Plan of investment and development of the LR&I management system in the annex.
96. The Government of Tajikistan will continue providing direct and indirect support to ALRI and its units. Annual direct financial assistance of the Government of the Republic of Tajikistan from the national budget is equal to 60 million TJS, and in the form of preferential electricity rates for pumping irrigation needs during the growing season and for reclamation pumping stations throughout the year.

**PLAN OF INVESTMENT IN DEVELOPMENT OF THE LAND RECLAMATION AND IRRIGATION SECTOR
FOR 2015-2025**

In thousands of TJS

№	Activity	Executing agency	Implementation period										Centralized republic budget	Partners	Total
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>Legislation development and regulation</i>															
1.	Adoption of the new Resolution of the Government of the RT on approval of the Regulation on the powers of the specially authorized state bodies on use and protection of water resources	MEWR, MJ, ALRI, SUE KMK, COEP,	90											90	90
2.	Analysis and review of the new edition of the Regulation or other instruments governing the activities of the ministries and agencies involved in water resources management. Periodic review of these documents	MEWR, MJ, ALRI, SUE KMK, COEP	160								10	10	20	160	180
3.	Organization and holding of meetings of the National Commission on Irrigation and Drainage (4 meetings per year)	ALRI and NCID members	180	180	180	180	180	180	180	180	180	180		1800	1800

4.	Development of the draft National Water Strategy and submission to the Government of Tajikistan for consideration and acceptance	MEWR, ALRI, SUE KMK, COEP, WUA,	5	140	120								5	260	265
5.	Analysis and development of the draft Water Code of the RT in a new edition	MEWR, ALRI, SUE KMK, COEP, WUA			85	85								170	170
6.	Development of the draft Land Reclamation and Irrigation Development Program	ALRI, Regional and District ALRI branches, WUA	160	140										300	300
7.	Amendments to the Law of the Republic of Tajikistan "On Water User Associations"	ALRI, MEWR, WUA, ЗМИБ	80	60										140	140
8.	Drafting of the Law of the RT "On Land Reclamation and Irrigation"	ALRI, MEWR, COEP, WUA	120	10										130	130

9.	Development of seasonal and annual plans of water distribution and water resources management in the river basins	MEWR, RBO, ALRI, MoA, COEP		1000	1000	5	5	10	10	10	10	10	60	2000	2060
10	Development of the procedure and manual for signing off tertiary irrigation and drainage network (in-farm and other related infrastructure) to the WUA or transfer of its management rights	ALRI, WUA			65	65								130	130
11	The study of the economic condition and development of recommendations to improve the financial and economic sustainability of the organizations providing water supply services in the water sector	MEWR, ALRI, SUE KMK, COEP, WUA		108	108	108	108							432	432
12	Development of a new methodology for determining the irrigation service rates allowing full cost recovery and development of the sector, submission to the GoT for approval	ALRI, MF, MEDT, AMC, WUA		40	40	30	30							140	140
<i>Institutional development</i>															
13	Strengthening of existing and creation of new WUAs	ALRI, МИОГВ	5330	29315	31200	16575	4225	50	50	50	50	50	250	86645	86895

14	Shifting the WUA activity from Jamoat and District boundaries to hydrographic boundaries	ALRI,	65	260	260	28535	22230							51350	51350
Infrastructure rehabilitation															
15	Inventory of fixed assets of the irrigation and drainage, especially those that will be given to WUA	ALRI, WUA		350	350	350	350							1400	1400
16	Development Plan of funding and rehabilitation of the irrigation infrastructure. Updating the Plan	ALRI, MF MEDT, MEWR	325	325	325	325					50	50	100	1300	1400
17	Rehabilitation of irrigation infrastructure and improving conditions of infrastructure operation and maintenance	ALRI, MEWR	10216 8	95550	15866 5	64350	39195	36000	36000	36000	36000	36000	90000	549928	639928
18	Replacement of worn-out machinery with modern and new one for water sector infrastructure	MEWR, ALRI, SUE KMK	3000	6500	1200 0	12000								33500	33500
Auxiliary means of the water sector reform															
19	Creation and development of the water sector database and information system	MEWR, ALRI, SUE KMK, COEP, COES	195	195	195	195	195	30	30	30	30	30	150	975	1125

20	Strengthening the capacity of the water sector and water user organizations	MEWR, ALRI, SUE KMK, COEP, WUA	1200	1200	1200	1200	1200	50	50	50	50	50	250	6000	6250
21	Organization of seminars, conferences and other public events devoted to the use and protection of water resources	MEWR, MFA, COEP, ALRI, SUE KMK and ЗМИБ	50	50	50	50	50	50	50	50	50	50	167	333	500
22	Training and further education of young professionals, staff and managers of the water sector organizations in developing and developed countries	MEWR, MFA, COEP, ALRI, SUE KMK	100	100	100	100	100	100	100	100	100	100	333	667	1000
23	Research on improving water use efficiency	MEWR, COEP, ALRI, SUE KMK, Academy of Sciences	100	100	100	100	100	100	100	100	100	100	333	667	1000
	TOTAL		113332	135628	206049	124260	67976	36579	36580	36581	36642	36643	91682	738532	830201

