

IRRIGATION SYSTEMS INVENTORY METHODOLOGY



«Promoting integrated water resources management and fostering transboundary dialogue in Central Asia»

EU-UNDP project (2009-2012)



The project is financed
by the European Union



MINISTRY FOR FOREIGN
AFFAIRS OF FINLAND



*Empowered lives.
Resilient nations.*

This publication was issued with the European Union support. Responsibility for the contents of this publication fully rests with the author. Ideas expressed in this publication in no case should be considered as the official position of the EU or UN.

All rights reserved © UN Development Programme 2011

Management of the «Promoting integrated water resources management and fostering transboundary dialogue in Central Asia» project:

Natalia Alexeeva – Coordinator of Water Programmes for Central Asia, Regional Centre for Europe and CIS countries, office in Almaty, UNDP;

Ahad Mahmudov – Programme Manager, Energy and Environmental Protection Programme, UNDP/Tajikistan;

Anatoly Kholmatov - Project Manager, UNDP/Tajikistan.

Author: Kodir Aliev – Head of Department of irrigation systems management, Ministry of Land Reclamation and Water Resources of the RT, National Expert, PhD in Engineering.

International Consultant – Terence Podmore, PhD., P.E. Professor, Colorado State University at Fort Collins, USA

Editor-in-Chief - Anatoly Kholmatov

Table of Contents

Introduction	5
Terms and definitions.....	6
Abbreviations	7
Legal regulatory framework of the Republic of Tajikistan and sources used for drafting the irrigation systems inventory methodology	8
Objectives and necessity of irrigation systems inventory	8
Irrigation systems inventory procedure.....	9
Comments to inventory records.....	11
Summary of inventory results.....	13
Information system and mapping of irrigation systems including serviced and occupied lands.....	13
Annex 1. Standard norms of depreciation charges for complete recovery of capital assets of irrigation systems in Tajikistan	14
Annex 2. Standard norms of depreciation deductions of capital assets of irrigation systems in Tajikistan.....	20
Annex 3. Inventory records	21

Introduction

The Republic of Tajikistan supports and participates in the process of implementation of principles of the integrated water resources management based on the "Millennium Development Goals".

The "Promoting integrated water resources management and fostering transboundary dialogue in Central Asia" project was supported by the EU, UNDP, Finland and Governments of the Republic of Kazakhstan, the Kyrgyz Republic and the Republic of Tajikistan. The project aims at promoting transboundary dialogue and fostering integrated water resources management in Central Asia through parallel interventions at the national and transboundary levels. One of the project areas is drafting a single legal - regulatory, organizational - technical, financial - economic approach to the IWRM in an effort to improve the irrigation system and reform it institutionally, as well as to build IWRM capacity, improve the information access and exchange between all stakeholders.

Within the framework of this project the "Irrigation Systems Inventory Methodology" was developed, which will help to determine condition and affiliation of capital assets and establish basin water management organizations based on hydrographic principle.

The agricultural output of Tajikistan is based on irrigated lands. According to the data of the State Committee on Land Management and Geodesy of the Republic of Tajikistan, as of January 1, 2010 there were 743,600 hectares of irrigated land in the country.

It should be noted that in the 1980-s irrigated land was smoothly provided with the irrigation water, because funding was entirely provided from the centralized budget and the hydraulic facilities were mainly new.

Since 1990-s maintenance of irrigation systems deteriorated due to difficulties of the transition period to market economy.

In accordance with the Decree № 1775 of the President of the Republic of Tajikistan of June 30, 2006, "On additional measures on reorganization and reforming of agricultural organizations", maintenance of facilities, roads, schools and other auxiliary agricultural facilities were subject to transfer to the balance of relevant ministries and agencies.

On the basis of basic irrigation assets of former collective (kolkhoz) and state (sovkhoz) farms it was necessary to create water user associations and based on capacities of the reformed farms, to provide them with necessary facilities.

Irrigated land was distributed among dehkan (individual) farms, and respectively the land of the Water fund connected to hydrotechnical facilities was included into the land certificates of newly formed farms, and the hydrotechnical facilities remained without any owner. Because of this situation with intra-farm hydrotechnical facilities, 54,000 hectares of land are not provided with water. Out of 6,750 km of facilities, regulating the level of underground waters, 3,400 km are intra-farm and in fact are also considered ownerless. More than 2,000 km of intra-farm subsurface (closed) drainage were not cleaned or repaired in the past 20 years. Technical and financial capabilities of scattered dehkan farms do not allow them to maintain and clean these facilities.

All facilities, constructed before the 1990-s, were located in specific irrigation areas, with a view for every separate kolkhoz and sovkhoz. They used water from sources and separate canals, equipped with hydrotechnical facilities and water meters. Kolkhozes and sovkhozes were reformed into a great number of dehkan farms not united into water users associations within separate hydrographic units. This complicates regulation of the water supply to these farms in accordance with current standards and norms and makes problematic repair and maintenance

of facilities.

In accordance with the concept of improvement of the public administration in the Republic of Tajikistan, approved by Decree № 541 of the President of the Republic of Tajikistan of September 16, 2008, the Address of the President of the Republic of Tajikistan to the Majlisi Oli (Parliament) of the Republic of Tajikistan on April 15, 2009, Instruction № 13/5-1 of the Government of Tajikistan of May 7, 2009, the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan with the support and in collaboration with ministries and agencies concerned, Water users' associations, the National Association of dehqan farms, FAO, EC, USAID, UNDP and other organizations developed a package of documents on shifting the irrigation sector to the hydrographic principles of management. In the process of this work, it became necessary to clarify such important issues as:

- Availability of irrigation systems facilities,
- their ownership and technical conditions,
- amount of necessary funds for rehabilitation.

The inventory of capital assets of all irrigation systems based on a single methodology will help answering these questions and promote the irrigation sector reform through creation of basin organizations and sustainably operating WUAs in respective hydro geographic units and further transition to the integrated water resources management.

Terms and definitions

Irrigation system – a land area with located hydrotechnical constructions (water intake facilities, water-retaining constructions, canals, tunnels, pipelines, dams, pumping stations, drainage etc.) and operational facilities (roads, bridges, power transmission lines, communication lines, water measuring structures, buildings, etc.) on it that provide its irrigation. The system is divided into intra-farm and inter-farm parts, which based on their ownership status belong respectively to the state operational organizations and water users associations.

Irrigation network - permanent and temporary canals, irrigation system pipelines, delivering water from the irrigation sources to the irrigated land.

Hydrotechnical facilities - constructions intended for the use of water resources, as well as for the control of harmful effects of waters. Hydrotechnical facilities are divided into water-retaining structures (dams, dikes, etc.), feeding structures (canals, pipelines, conduits, tunnels, etc.), regulating structures (dike dams, stream deflectors, groining, etc.), water intake facilities, spillway structures, special constructions (buildings of pumping stations, hydropower stations, canal locks, canal lifts, etc.)

Hydropower installation - a single set of general and special hydrotechnical constructions.

Negative impact of waters - flooding, underflooding, erosion, destruction and other negative effects of surface and underground waters on certain territories and facilities.

Water protection strips (zones) - area directly adjoining riverbeds, different purpose canals, water reservoirs and other water facilities where a special regime of water use is set in order to protect these facilities from contamination, sedimentation with products of erosion, clogging by driftwood and other negative phenomena, as well as for creation of a favorable water regime

Water user – individuals or legal entities receiving water in accordance with established

procedure to supply their needs

Amelioration (Land reclamation)- set of organizational - economic and technical measures on radical improvement of land with unfavorable water and air regimes, chemical and physical properties, prone to harmful mechanical effect of winds or waters. Types of amelioration: irrigation, drainage, chemical and protection forestry.

Irrigation rate - the amount of water supplied during irrigation to 1 ha of crops for the entire period of vegetation

Irrigation regime – aggregate of number, time and rates of watering of agricultural crops

Balance inventory - distribution of key assets of irrigation systems among the owners.

Abbreviations

WUA - Water Users Association

atm – pressure, in atmospheres

HPS – hydropower stations

ha - area in hectares

etc. - others

EU - European Union

IWRM - Integrated Water Resources Management

sq.m - square meters

kV - voltage in kilovolts

KW - power in Kilowatts

PTL - Power transmission lines

m³/sec - water consumption (discharge of water) in cubic meters per second

mm - millimeters

PS - pumping stations

UNDP - United Nations Development Programme

rm - Running meter

USSR - Union of Soviet Socialist Republics

etc. – et cetera

th. km - thousand kilometers

TJS – Somoni, national currency of Tajikistan

USA – United States of America

FAO - Food and Agriculture Organization

pcs. – quantity in pieces

USAID - U.S. Agency for International Development

el. - electric

Legal regulatory framework of the Republic of Tajikistan and sources used for drafting the irrigation systems inventory methodology

During drafting the irrigation systems inventory methodology the following normative-legal acts were used:

- Methodological instructions on the inventory of assets and financial obligations approved by the order № 45 of the Ministry of Finance of the Republic of Tajikistan of May 22, 1997.
- Instruction on accounting in state-financed institutions, approved by the order № 157 of the Ministry of Finance of the Republic of Tajikistan of December 26, 2000,.
- Water code of the Republic of Tajikistan, November 29, 2000, #34
- Decree № 1775 of the President of the Republic of Tajikistan of June 30, 2005, "On additional measures on reorganization and reforming of agricultural organizations."
- Norms of calculation of depreciation for restoration of capital assets of the national economy of the USSR. Resolution № 1072 of the Council of Ministers of the USSR of October 22, 1990. These norms were reissued in accordance with the order #86 of the Ministry of Finance of the Republic of Tajikistan of September 5, 1997. Single norms of depreciation expenses for complete recovery of capital assets of irrigation systems are given in the Annex #1.
- Methodological recommendations on application of International Financial Reporting Standards. Volume 1c of IFRS (IAS) 1 up to IFRS (IAS) 28, Dushanbe, 2009;
- International Financial Reporting Standards, volume 2 of IFRS (IAS) 28 up to IAS (IFRS) 7, Dushanbe, 2009;
- Instruction on accounting in state-financed institutions. Dushanbe, 2010, Part III, pp.78-83;
- main provisions of the inventory of capital assets, tangible assets, monetary funds and cash payments. Annex to the letter № 179 of the Ministry of Finance of December 30, 1982 with addendum № 51 of March 27, 1984;
- Soviet Encyclopedic Dictionary, Moscow, 1984;
- Handbook of Irrigation Engineer, Lenizdat, 1988, Y. Z. Shevelev, V.I. Revut, S. T. Daishev.

Objectives and necessity of irrigation systems inventory

The relationship between water suppliers and consumers are formed directly on the basis of quantitative and technical conditions of irrigation facilities, since the timeliness and quality of water services depend on it. Therefore, the primary objective of inventory of irrigation systems is to obtain information about the actual availability, technical conditions, and the balance cost of their facilities.

The inventory is also needed due to the following reasons:

- determining the balance inventory and operability of facilities, planning and carrying out repair and maintenance works, making decision on a possible writing-off facilities that cannot be restored;
- determining irrigated land area serviced by different facilities by their actual capacity, as well as land area connected with various irrigation systems facilities (under the facilities, their water protection zones and other exclusion zones around them).

Streamlining these issues will contribute to developing feasible (well-thought) plans on water use and effective management of water and land resources within the limits of irrigation systems, mapping the location of intra-farm and inter-farm facilities and transferring them respectively to basin organizations and WUAs.

Irrigation systems inventory procedure

In accordance with this methodology the entire infrastructure of irrigation systems is subject to inventory: irrigation canals, conduits, pipelines, drainage, water collector-waste and collector-drainage networks, water measuring devices, bridge-crossings, pump stations, vertical drainage wells, irrigation wells, water reservoirs, different dikes, mudflow conduits and flumes, dams and other irrigation structures, departmental roads, buildings, radio-stations, power and telephone lines and other facilities, as well as serviced and occupied lands. During the inventory the entire infrastructure of irrigation systems should be subdivided into intra-farm and inter-farm parts and regardless of the current administrative-territorial principle of water resources management it is necessary to indicate the river basin, where this part (infrastructure) is located. It will facilitate establishment of basin organizations in the future and assigning relevant facilities to them.

Based on the methodological instructive regulations and instructions approved respectively by the orders №45 of May 22, 1997 and №157 of December 26, 2000 of the Ministry of Finance of the Republic of Tajikistan the inventory of capital assets, as a rule, is carried out once a year, or in cases of transferring from the balance to the balance as well as in case of deficiencies of these or another capital assets the inventory is carried out urgently.

The order about carrying out the inventory is issued in the order of subordination by relevant organizations/owners of irrigation systems. Based on basic principles on the inventory of capital assets, tangible assets, monetary funds and cash payments (annex to the letter № 179 of the Ministry of Finance of December 30, 1982, section IV, part 3, page 230), permanently functioning inventory commissions are established by the order as follows:

- Head of the organization or his deputy (Chairman of the commission);
- Chief Accountant;
- Heads of structural departments (services);
- Representatives of local administrations;
- Representatives of public organizations (WUAs, dehkan farms, etc.).

For immediately carrying out the inventory, and especially when a volume of work is large, for carrying it in one time the specific inventory zones are established and are assigned to work groups. The working groups on carrying out the inventory include:

Hydraulic engineer - 1 person

Electrical engineer - 1 person

Engineer of pumping stations - 1 person

Accountant - 1 person

Land Surveyor - 1 person

Representative of the local administration – 1 person;

Representatives of public organizations (WUAs, dehkan farms etc.) - one from each organization upon availability of water facilities on their balance.

Members of permanently functioning inventory commissions and inventory working groups shall be approved by a head of the organization/owner of capital assets of irrigation systems. Committees and inventory working groups should include experienced subject specialists who are well aware about capital assets subject to inventory, their prices and primary records.

In the period between inventories, in organizations the systematic check-ups and sampling inventory of capital assets at their location should be carried out. These checks and inventories are carried out by the order of the Head of the organization, by members of inventory groups of the organization.

Permanently functioning inventory commissions:

- carry out preventive works to ensure safety of capital assets of irrigation systems, if necessary, at their meetings hear the accounts of Heads of structural subdivisions on preservation of capital assets;

- organize carrying out inventories and instruct members of the inventory working groups;
- carry out control checkups of the correctness of carrying out inventories, and also carry out sampling inventories in the period between inventories;
- verify the correctness of the inventory results;
- where appropriate (at revealing serious violations of the rules of carrying out the inventory, etc.) the repeated total inventory shall be carried out by the order of the Head of the organization;
- consider explanations of persons who have allowed the damage, deficiencies of capital assets, as well as other violations, and make suggestions about the order of regulation of revealed violations.

Inventory working groups:

- carry out the inventory of capital assets at the place of their location;
- together with the accounting department of the organization participate in determining the inventory results and developing proposals for addressing identified deficiencies;
- make suggestions on issues of streamlining stocktaking and control, storage, receiving, transfer of capital assets;
- responsible for timeliness and adherence to the procedure of carrying out inventory in accordance with the order of the Head of the organization, as well as for the correct and timely registration of relevant materials;
- responsible for the completeness and accuracy in entering the data on audited capital assets into the inventory records;
- responsible for the accuracy of indicating distinctive features of capital assets in inventory records (type, brand, size, serial number by the price list, prices etc.);
- taking photos of the condition of facilities.

Members of inventory commissions are subject to prosecution in accordance with the procedure established by law for entering of knowingly incorrect data into the inventory records.

Appropriate funding is determined and sought for employees participating in the inventory. In order to implement this task, each working group is provided with means, instruments, and vehicles based on the amount of works, number of specialists in working groups.

The funding can be provided for from the following sources:

- from the centralized budget of the Republic of Tajikistan. In this case, working groups for each district are formed in accordance with the order of the Minister of Land Reclamation and Water Resources of the Republic of Tajikistan.
- on account of foreign investments, in this case for carrying out the inventory the appropriate organization shall be determined and authorized on a tender basis.

The inventory of irrigation systems is carried out in the following order:

1. To determine the number of facilities;
2. to identify justifying documents and the original cost of structures;
 - assessment of condition of facilities
3. to identify the capacity of facilities;
4. to determine the depreciation cost of structures;
5. to prepare plans and maps of facilities' location;
6. to include data about facilities into the database;
7. to prepare proposals for assigning facilities to relevant organizations.

It should be noted that the original documentation on facilities of intra-farm irrigation systems has not remained everywhere, and therefore the balance cost is determined by methods set forth in section 7 of this methodology. Location of intra-farm and inter-farm facilities is shown on drawn up maps defining and fixing their geodetic marks.

Depreciation of inter-farm irrigation systems facilities is determined in accordance with the instruction approved by the order № 86 of the Ministry of Finance of the Republic of Tajikistan of September 5, 1997. Single norms of depreciation charges for the complete recovery of capital assets of irrigation systems in Tajikistan are given in Annex 1. The inventory is carried out with

use of special inventory records (See Annexes 2,3,4), where the necessary data is recorded.

Comments to inventory records

Inventory records of inter-farm and intra-farm irrigation systems facilities and correspondingly of pumping stations differ only by the name and ownership of capital assets. The rest in inventory records is the same.

The inventory records sheets of capital assets of inter-farm (intra-farm) irrigation systems, pumping stations, residential and administrative buildings and facilities contain the following information:

Item number of facilities and capital assets – in the first column;

1. Name of facilities. This column includes all capital assets except for the office equipment and supplies. If any facilities are similar, they are numbered or named by the place of affiliation. If ownership of capital assets of intra-farm irrigation systems is not known, the corresponding Jamoat of their location should be indicated.
- In the column "Length" the length of canals, collectors, drainages etc. should be indicated.

Year of commissioning. This column includes the data in accordance with the acceptance records of the facility. Failing the necessary documentation, the evidence of individuals is recorded who know for sure the year of its commissioning;

Capacity of the facility is recorded in accordance with the construction project. Failing the original documents, the amount of land irrigated by this facility earlier and now is recorded based on the current condition;

Documents are recognized that indicate the acceptance of the facility and are confirmed by the decision of one or another governmental body. Failing such documents, it is marked "Not available". If the documents are available, the date and the number of the act of the governmental body about commissioning of the facility is indicated;

The indicator "Serviced lands" characterizes the current conditions of the facility with regard to serviced irrigated lands. It should be noted that in some cases, project decisions do not get in line with the reality, because in some areas, the water-supply facilities got out of order or some buildings were constructed on these lands. In these cases, only irrigated areas are appended to the facility;

In accordance with documents, lands of the Water fund were allocated for location of the irrigation system facilities. At the same time, operating sites, provided for in projects, but for some reasons not taken into account during the inventory, are considered in together with facilities and their reserve areas;

The balance cost – it is the cost of capital assets, from which a rate of depreciation is deducted during the inventory. It should be noted that in some organizations, the balance cost of capital assets with respect to the current conditions was not recalculated. Therefore the initial balance cost during the inventory is calculated over again;

The project cost – assets at initial expenses put on the books (balance) during commissioning of the facility.

Code - a numbered index of the depreciation standard in percentage terms for calculating the cost of rehabilitation of capital assets, approved by the resolution № 1072 of the Council of Ministers of the USSR of October 22, 1991 and re-approved by the order № 86 of the Ministry of Finance of the Republic of Tajikistan of September 5, 1997 (See Annex 1).

Depreciation standards in percentage terms are determined for each type of facility (See Annex 1);

Depreciation standards – a value limit of the depreciation of the construction or a capital asset that is counted towards a year;

The current cost is determined by excluding depreciation cost.

Ownership of the facility is determined on the basis of available relevant documents. Ownership of inter-farm facilities is known from available relevant documents. However, the intra-farm facilities remained ownerless. In this case in the inventory records the name of a dehkan farm should be indicated where a canal or other facilities are located;

Members of the inventory working group assess a facility condition and in case if it is operational and routine maintenance is required, then it is graded as "satisfactory", and if for its restoration extraordinary repair is needed, then it is graded as "unsatisfactory."

Inventory records of a technical condition of pump stations differs from other inventory records by the amount and types of fixed assets.

During the inventory of pumping stations also it is needed to do the following:

- in the column "brand of pumps" – the brand of the plant-manufacturer is indicated. In the case of uncertainty, it is determined by the amount of supplied water and consumed electricity in accordance with existing catalogues;
 - in the column "the number of pumps" main pumps are accounted separately, as well as vacuum and drainage pumps installed at pumping stations. In the "Notes" column the relevant explanatory notes are done;
 - in the column "the brand of the electric motor," the plant-manufacturer is indicated. In case if the brand is unknown it is determined by the consumed electricity by readings of electric meters in accordance with existing catalogues;
 - the brand of the transformer is determined by the inscription of the plant-manufacturer;
 - quantity of pipelines, this indicator is such, that constructively several pipelines can be attached to one pump. In some cases, 4-6 pumps work for two pipelines, so against the first and second primary pumps lines of the pipeline are indicated and against other pumps the dash (hyphen) is put;
 - the pipeline diameter is determined by the pipeline, which is indicated at the pump;
 - the length of the pipeline - the length of those pipelines is indicated that are specified in the appropriate column against the primary pumps and against other pumps the dash (hyphen) is put.
- in the column "Power transmission lines" the length should be indicated;
- in the column "pumping station buildings" the number of building affiliated with a pumping station are indicated.

In the “Notes” column the data is indicated that is important for the work, but not provided for in the inventory records.

Summary of inventory results

After completion of the inventory of irrigation systems, their results are summarized on the district level indicating river basins where they are located. After that, they are passed to relevant territorial and oblast (regional) inventory working groups. Then summarized territorial and regional inventory materials and prepared schemes of district irrigation systems linked with river basins and concrete water sources are submitted to the national inventory working group for the review and summary. The Government of the Republic of Tajikistan is informed about results of the inventory.

Information system and mapping of irrigation systems including serviced and occupied lands

For managing the database on inventory of irrigation systems, under the Ministry of Land Reclamation and Water Resources of the Republic of Tajikistan, a modern information system is created where printed and cartographic materials are stored. The structure and operation procedure of this database is determined by this Ministry.

The intra-farm and inter-farm irrigation systems, starting from the water sources and up to their end point should be mapped.

District, oblast, basin and national maps of irrigation system facilities with outlines of irrigated lands, serviced by them, indicating capacity of facilities, height marks are developed on the basis of schemes of location of irrigation systems facilities prepared in the course of inventory with the assistance of the State Committee on Land Management and Geodesy of the Republic of Tajikistan. During snapping location of each irrigation structure on the map the serviced lands and territories attached to them are also indicated (lands under each structure, various industrial and protected strips and zones).

Annex 1. Standard norms of depreciation charges for complete recovery of capital assets of irrigation systems in Tajikistan

GROUPS AND TYPES OF CAPITAL ASSETS	CODE	NORMS OF DEPRECIATION CHARGES
Industrial and non-industrial buildings		
Multistoried buildings (more than two floors) except or multistoried buildings of a bookstand type of a special technological purpose	10001	1.0
Two-storied buildings of all purposes except for wooden buildings of all types; one-storey buildings with reinforced concrete and metal structures, with walls of stone materials, large blocks and panels, with reinforced concrete, metal and other durable coverings, with the floorspace up to 5,000 square meters	10002	1.2
One-storey buildings, frameless, with walls of lightweight masonry with reinforced concrete, brick and wooden columns and pillars, with reinforced concrete, wooden and other floors and coatings, wooden buildings with cobbled or timbered walls, one-, two-, or more storeys.	10004	5.0
Irrigation structures		
Concrete, reinforced concrete, stone, earth dams, tunnels, spillways and water intakes, sediment boxes, aqueducts, conduits, bottom pipes and water conducting structures, discharge lines and surge chambers; diversion canals, head ponds; dams protecting earth dams without lining.	20100	1.0
Bank protection structures, of reinforced concrete, concrete, stone	20101	3.35
Irrigation structures wooden (including buildings)	20103	3
Reservoirs at earth dams	20106	1.35
Spillways and water outlets at pools:		
concrete and reinforced concrete	20107	2
wooden	20108	8
Irrigation intra-farm structures on canals (regulators, bridges-water conduits, check drops, inclined falls, lip drops, bottom pipes, including steel ones, aqueducts, including stone, concrete and reinforced concrete spillways)	20110	2.5

Irrigation structures on inter-farm and intra-farm canals, wooden	20111	8.0
Inter-farm and intra-farm irrigation network:		
*earth canals without lining, canals lined up with stones, concrete and reinforced concrete; inter-farm and intra-farm drainage-spillway network of open earth canals; intra-farm and inter-farm collector-drainage canals without anchoring	20112	20.0
*canals of reinforced concrete conduits	20113	4.0
*canals of asbestos-cement, steel and polyethylene pipes	20114	2.5
Closed collector-drainage network:		
*canals of asbestos-cement pipes	20115	2.5
*canals of clay pipes	20116	1.6
*canals of plastic pipes	20117	3.3
Regulated rivers-water intakes, inter-farm, drainage discharge, main and other canals, earthen without anchoring and with anchoring with raddle, hurdle, planks; intra-farm drainage canals earthen without anchoring and with anchoring with raddle, hurdle, planks and sowing of the grass in peaty soils.	20119	2.0
Drainage (horizontal) for draining agricultural lands:		
* tile drainage in mineral soils	20120	1.2
* plastic	20122	2.5
Protective structures :		
* earthen, concrete and reinforced concrete,	20129	1.1
* metal and wooden	20130	2.0
Floating fish pond lines for fish growing:		
* Metal bridge boats	20154	10.0
Structures of transport, communication and other sectors		
Bridges reinforced concrete, concrete and stony of all types and constructions as well as pipes and conduits, reinforced concrete, stony and cast-iron.	20200	1.0
Metal bridges	20201	2.0
Bridges, wooden and metal on wooden supports	20202	5.0
Steel pipes channeled	20204	1.7
Crane tracks	20210	4.2
Bottom pipes steel, water-supply, sewage with chambers	20339	4.0
Wells, reinforced concrete	20348	1.7

Fences (barriers):		
* stony and metal	20350	2.1
* reinforced concrete	20351	3.3
Hothouses and greenhouses		
Hothouses glazed and with film coating with a framework from steel constructions of special profiles	20362	3.5
Power transmission and communication devices		
Air power transmission lines with the voltage from 0,4 up to 20 kilovolt:		
* on metal or reinforced concrete supports	30006	3.0
* on supports out of impregnated wood and unimpregnated larch	30007	4.0
* on supports out of unimpregnated wood	30008	6.0
Air power transmission lines with the voltage of 35-220, 330 kilovolt and higher on metal and reinforced concrete supports	30009	2.0
Air power transmission lines with the voltage of 35-220 kilovolt on wooden supports out of impregnated timber and unimpregnated larch	30010	3.3
Cable power transmission lines with the voltage of 10 kilovolt: with the lead sheath, laid in the ground, in premises; with aluminum sheath, laid in premises	30011	2.0
Cable power transmission lines with the voltage of 6-10 kilovolt with the lead sheath laid under the water. Cable power transmission lines with the voltage of up to 10 kilovolt with the aluminum sheath, laid in the ground	30012	4.0
Cable power transmission lines with the voltage of 10 kilovolt with plastic sheath, laid in the ground, in premises; Cable power transmission lines with the voltage of 20-35 kilovolt with the lead sheath, laid under the water	30013	5.0
Pipelines		
Sewerage networks (collectors and street network with wells and fittings):		
* asbestos-cement	30105	3.3
* steel	30108	4.0
Water supply networks with wells, stand pipes, hydrants and other equipment), including water conduits:		
* asbestos-cement, steel	30109	5.0
* cast-iron	30110	1.7
* reinforced concrete	30111	3.3
Electric motors и diesel-generators		
Electric motors:		

* with the height of roll axis 63-450 mm	40200	6.6
* with the height of roll of more than 450 mm	40201	5.6
Diesel-generators with the rotation velocity:		
* up to 500 rpm	40202	4.2
* more than 500 rpm	40203	6.2
Complex installations		
Electrical units of АД-100С-Т400-Р (АСД-100-Т-400-Р) type and others and mobile electric stations	40300	12.5
Mobile railway electric stations with small capacity (up to 9 kilovolt), diesel electric stations on automobile trailers and gas-turbine mobile electric stations with aircraft engine and also mobile boilers	40301	10.8
Tractors		
Tractors, wheeled, general purpose, class 5.0 t:		
K-700, K-701 and modifications	40600	10.0
Track tractors, general purpose, class 4.0 t:		
T-4, T-4A and modifications	40601	12.5
Wheeled tractors, general purpose, class 3.0 t:		
T-150 K	40602	10.0
Tractors, class 0.6 t:		
T-16 M, T-25 A and their modifications	40610	12.5
Press-forging plant		
Presses mechanical, hydraulic, scissors, correcting and bending machines, forging rolls, forging hammers, pneumatic and set hammers with a weight of up to 30 t	41200	7.7
Compressor units and equipment		
Air pumps, general purpose, with pressure of up to 8 atm (with the productivity up to 20 cubic meters per minute)	41400	5.4
Compressors, stations and compressor installations, stationary, driven, general purpose, with pressure of up to 12 atm:		
* with the productivity of up to 50 cubic meters per minute	41407	7.7
* with the productivity of more than 50 cubic meters per minute	41408	5.5
Pumps		
Pumps artesian, pneumatic, threaded, submerged; engine-driven pumps	41500	20

Sand dredges, banner; slurry, bitumen pumps and coal pumps; pumps for swapping liquids, corroding metal	41501	33.3
Pumps centrifugal, axial, swirling, diagonal (water supply, sewage)	41502	12.5
Vacuum pumps and units on their basis, vacuum installations	41503	10.0
Lifting-and-carry and loading-and-unloading machines and equipment		
Tower cranes and vehicle mounted cranes with a lifting capacity of up to 10 t; cranes on pneumatic run with a lifting capacity of up to 16 t; erection derrick-cranes for construction of bridges; cranes for cooling towers construction	41700	10.0
Crawler mounted cranes, on the special truck-like chassis with a lifting capacity of up to 40 t	41701	9.1
Tower cranes and vehicle mounted cranes with a lifting capacity of up to 10 t; Cranes on pneumatic run with a lifting capacity of more than 16 t up to 40 t	41702	7.7
Tower cranes with a lifting capacity of more than 25 t; cranes on pneumowheel run, crawler mounted cranes, vehicle mounted cranes on a special chassis, on the short-base chassis with a lifting capacity of more than 40 t; Tower cranes, attached; cable cranes	41703	6.7
Full gantry cranes, general purpose (hook), with a lifting capacity of up to 15 t, with automatic grasps; overhead cranes, single-beam with electric hoist, including console-overall rail mounted cranes, type ГЭПК-130	41704	5.0
Machines and equipment for the land and quarry operations		
Excavators single-bucket track mounted and pneumatic run with the bucket capacity of up to 0,4 cubic meters, universal hydraulic with the main bucket capacity of up to 1 cubic meter; trench excavators, chain and rotor for digging trenches with the depth up to 1,6 m; chain-bucket excavators, trenching machines, screw, rotor and milling with the depth of digging up to 3 meters; chain-bucket excavators, trench (rotor, pit-run and chain); canals cleaning machines for maintenance of canals with the depth from 2 up to 3 meters and in-channel machine for cleaning canals with the depth up to 4,0 meters	41800	12.5

Single-bucket excavators track mounted and pneumatic run with the bucket capacity from 0,4 cubic meters up to 0,8 cubic meters, universal hydraulic excavators with the main bucket capacity up to 1 cubic meter; trench-diggers on the basis of the tractor	41801	11.1
Rotor, land reclamation, pit-run and construction excavators with the bucket capacity of up to 50 liters, more than 50 liters up to 100 liters; trench excavators, chain and rotor for digging trenches with the depth up to 2,0 - 2,5 meters	41802	10.0
Single-bucket excavators: track mounted and on pneumowheel run with the bucket capacity from 0,8 up to 1.25 cubic meters, universal hydraulic excavators with the main bucket capacity of up to 1,6 cubic meters	41803	9.1
Machines and equipment for concrete and finishing works		
Plastering stations; mobile plastering stations; auger-type grouting reloader; plastering aggregate; color grinders, chalk grinder; plastering-mixing aggregate; machines for preparing and supplying of stiff mortars	42003	16.7
Mobile painting stations; painting stations; automatic sand-blasting machines; cement-injectors and installations for concrete evacuation; mixers for painting mortars	42004	12.5
Tubular scaffolding	42006	20.0
Sliding molding board	42007	22.0
Self-lifting swinging platforms, electrical	42008	16.7
Machines and equipment, crushing- fiber master, sorting, concentrating		
Bolting machines and meshes of all types	42600	14.3
Bolting machines of all types, including rod-shaped and with the inertial effect for diamond factories	42601	16.7
Breaking machines jawl and conical	42602	6.7
Other breaking machines and breaking-sorting aggregates	42603	10.0

Annex 2. Standard norms of depreciation deductions of capital assets of irrigation systems in Tajikistan

GROUPS AND TYPES OF CAPITAL ASSETS	CODE	NORMS OF DEPRECIATION DEDUCTIONS	
		IN PERCENTS FROM THE COST OF THE MACHINE	IN PERCENTS FROM THE COST OF THE MACHINE PER 1000 KM OF RUN
Trucks with the carrying capacity of:			
up to 0,5 t	50400	20	
more than 0,5 up to 2 t	50401	14.3	
more than 2 t. with the resource till the capital repairs:			
up to 200 thousand kilometers	50402		0.37
more than 200 up to 250 thousand kilometers	50403		0.3
more than 250 up to 350 thousand kilometers	50404		0.2
more than 350 up to 400 thousand kilometers	50405		0.17
Trailers and semitrailers with the carrying capacity of:			
up to 8 t	50410	12.5	
more than 8 t	50411	10	
Autos			
Autos of especially small class (with the working volume of the engine of up to 1.2 liters)	50412	18.2	
Autos of especially small class (with the working volume of the engine from 1.2 up to 1.8 liters)			
of a general purpose	50416	14.3	
Autos of a medium class (with the working volume of the engine of more than 1,8 up to 3,5 liters):			
of a general purpose	50418	11.1	
Buses of especially small class (with the length of up to 5 meters):			
of a general purpose	50420	14.3	

Annex 3. Inventory records

Inventory records of capital assets of inter-farm (intra-farm) irrigation systems _____

(District, Region, River basin)

№	Name of capital assets	Unit of measurement	Length	Year of commissioning	Capacity	Serviced lands, in hectares		Balance cost, thousand Somoni	Code	Depreciation cost thousand Somoni	Depreciated book value, thousand Somoni	Documents confirming year of commissioning	Ownership	Water protection strips (zones), hectares	Evaluation of the facility condition	Notes
						irrigated	including lands of the water fund									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

**Inventory records of inter-farm (intra-farm)
pump stations**

(District, Region, River basin, Republic of Tajikistan)

1	No
2	Name of pumping station
3	Year of commissioning
4	Irrigated area, in hectares
5	Type of pumps
6	Number of pumps, pieces
7	Suitable units
8	Productivity, m ³ /sec
9	Type of electric motor
10	Number of electric motors, pieces
11	Type of transformers
12	Number of pipelines, pieces
13	Diameter of pipelines, mm
14	Length of pipelines, r/m
15	Balance cost, thousand Somoni
16	Code
17	Amortization cost
18	Decision about commissioning
19	Ownership
20	Lands of the Water fund, in hectares
21	Assessment of condition
22	Notes

Inventory records of capital assets of intra-farm irrigation systems

(District, River basin)

№	Name of capital assets	Unit of measurement	Year of commissioning	Capacity	Serviced lands, in hectares		Balance cost, thousand Somoni	Code	Depreciation cost thousand Somoni	Depreciated book value, thousand Somoni	Documents confirming year of commissioning	Ownership	Water protection strips (zones), hectares	Evaluation of the facility condition	Notes
					Irrigated lands	including lands of the Water fund									
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															

Inventory records of intra-farm pump stations

(District, River basin)

1	№
2	Name of pumping station
3	Year of commissioning
4	Irrigated area, in hectares
5	Type of pumps
6	Number of pumps, pieces
7	Suitable units
8	Productivity, m ³ /sec
9	Type of electric motor
10	Number of electric motors, pieces
11	Type of transformers
12	Number of pipelines, pieces
13	Diameter of pipelines, mm
14	Length of pipelines, r/m
15	Balance cost, thousand Somoni
16	Code
17	Amortization cost
18	Decision about commissioning
19	Ownership
20	Lands of the Water fund, in hectares
21	Assessment of condition
22	Notes

Inventory records of technical condition of capital assets of inter-farm irrigation systems

(Oblast, Territory, River basin)

№	Name of capital assets	Unit of measurement	Year of commissioning	Capacity	Serviced lands, in hectares		Balance cost, thousand Somoni	Code	Depreciation cost thousand Somoni	Depreciated book value, thousand Somoni	Documents confirming year of commissioning	Ownership	Water protection strips (zones), hectares	Evaluation of the facility condition	Notes	
					Irrigated lands	including lands of the Water fund										
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

Inventory records of inter-farm pump stations

(Oblast, Territory, River basin)

1	№
2	Name of pumping station
3	Year of commissioning
4	Irrigated area, in hectares
5	Type of the pump
6	Number of pumps, pieces
7	Suitable units
8	Productivity, m ³ /sec
9	Type of the electric motor
10	Number of electric motors, pieces
11	Type of transformers
12	Number of pipelines, pieces
13	Diameter of pipelines, mm
14	Length of pipelines, r/m
15	Balance cost, thousand Somoni
16	Code
17	Amortization cost, thousand Somoni
18	Decision about commissioning
19	Ownership
20	Lands of the Water fund, in hectares
21	Assessment of condition.
22	Notes

Inventory records of technical condition of capital assets of intra-farm irrigation systems

(Oblast, Territory, River basin)

№	Name of capital assets	Unit of measurement	Year of commissioning	Capacity	Serviced lands, hectares		Balance cost, thousand Somoni	Code	Depreciation cost thousand Somoni	Depreciated book value, thousand Somoni	Documents confirming commissioning	Ownership	Water protection strips (zones), hectares	Evaluation of the facility condition	Notes
					Irrigated lands	including lands of the Water fund									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Inventory records of intra-farm pump stations

(Oblast, Territory, River basin)

1	No
2	Name of pumping station
3	Year of commissioning
4	Irrigated area, in hectares
5	Type of the pump
6	Number of pumps, pieces
7	Suitable units
8	Productivity, m ³ /sec
9	Type of the electric motor
10	Number of electric motors, pieces.
11	Type of transformers
12	Number of pipelines, pieces.
13	Diameter, mm
14	Length of pipeline, m
15	Balance cost, thousand Somoni
16	Code
17	Amortization cost, thousand Somoni
18	Decision about commissioning
19	Ownership
20	Lands of the Water fund, in hectares
21	Assessment of condition
22	Notes

Inventory records of technical condition of capital assets of inter-farm irrigation systems in the Republic of Tajikistan

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
№	Name of capital assets	Unit of measurement	Year of commissioning	Capacity	Serviced lands, in hectares		Balance cost, thousand Somoni	Code	Depreciation cost thousand Somoni	Depreciated book value, thousand Somoni	Documents confirming commissioning	Ownership	Water protection strips (zones), hectares	Evaluation of the facility condition	Notes
					Irrigated lands	including lands of the Water fund									

Inventory records of inter-farm pump stations in the Republic of Tajikistan

1	No
2	Name of pumping station
3	Year of commissioning
4	Irrigated area, in hectares
5	Type of the pump
6	Number of pumps, pieces
7	Suitable units
8	Productivity, m ³ /sec
9	Type of the electric motor
10	Number of electric motors, pieces
11	Type of transformers
12	Number of pipelines, pieces.
13	Diameter, mm
14	Length of pipeline, m
15	Balance cost., thousand Somoni
16	Code
17	Amortization cost, thousand Somoni
18	Decision about commissioning
19	Ownership
20	Lands of the Water fund, in hectares
21	Assessment of condition
22	Notes

Inventory records of technical condition of capital assets of intra-farm irrigation systems in the Republic of Tajikistan

№	Name of capital assets	Unit of measurement	Year of commissioning	Capacity	Serviced lands, in hectares		Balance cost, thousand Somoni	Code	Depreciation cost thousand Somoni	Depreciated book value, thousand Somoni	Documents confirming commissioning	Ownership	Water protection strips (zones), hectares	Evaluation of the facility condition	Notes	
					Irrigated lands	including lands of the Water fund										
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

Inventory records of intra-farm pump stations in the Republic of Tajikistan

1	No
2	Name of pumping station
3	Year of commissioning
4	Irrigated area, in hectares
5	Type of the pump
6	Number of pumps, pieces
7	Suitable units
8	Productivity, m ³ /sec
9	Type of the electric motor
10	Number of motors, pieces
11	Type of transformers
12	Number of pipelines, pieces
13	Diameter, mm
14	Length of pipeline, m
15	Balance cost., thousand Somoni
16	Code
17	Amortization cost, thousand Somoni
18	Decision about commissioning
19	Ownership
20	Lands of the Water fund, in hectares
21	Assessment of condition
22	Notes



*Empowered lives.
Resilient nations.*

UN Development Programme
The Regional Center for the Europe
and CIS countries,
Office in Almaty
Tole Bi, 67 | 050000
Almaty, Kazakhstan
Tel.: +7 727 2582643
Fax: +7 727 2582645

www.centralasia.iwlearn.org