

Basin

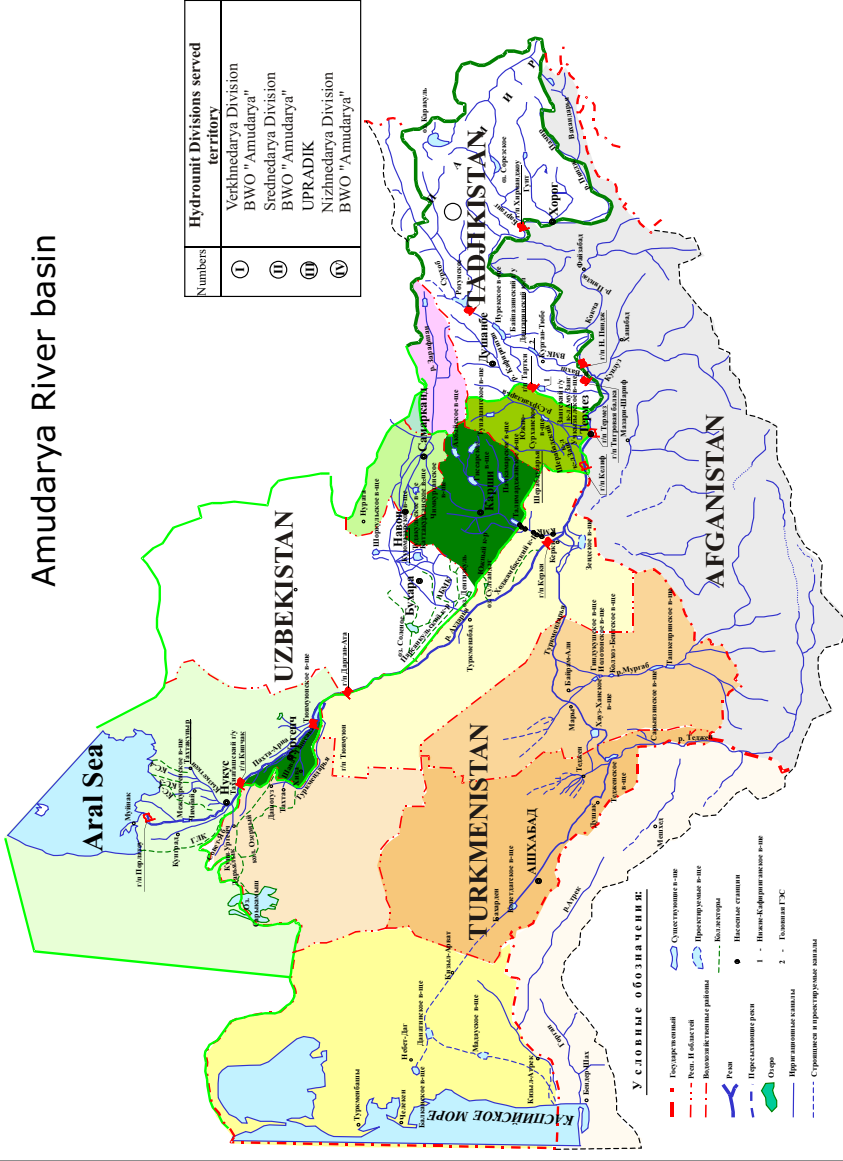
Water

Organization

# « Amudarya »



# Amudarya River basin



Numbers	Hydronit Divisions served territory
I	Verkhnedarya Division BWO "Amudarya"
II	Srednedarya Division BWO "Amudarya"
III	UPRADIK
IV	Nizhnedarya Division BWO "Amudarya"

- УСЛОВНЫЕ ОБОЗНАЧЕНИЯ:**
- Границы международных государств
  - Границы областей
  - Границы водных хозяйственных районов
  - Реки
  - Присоединяемые реки
  - Озёра
  - Страны и территории, обслуживаемые водными объектами
  - Существующие в-те
  - Проектируемые в-те
  - Источники водоснабжения
  - Плотины
  - Плотины с дамбами
  - Плотины-барьеры
  - Плотины-барьеры на в-те
  - Плотины ГЭС

**A** mudarya River basin with total area 1017.8 th.km<sup>2</sup> is located on territory of closed, isolated from oceans Aral Sea region without inflow.

Amudarya River basin covers totally territory of Turkmenistan and part of Tajikistan and Uzbekistan, Kyrgyzstan and Afganistan.

Amudarya is the largest river in catchment area and water availability in Central Asia and is formed by Pyandj and Vakhsh rivers conjunction. Its total length from Pyandj River head to Aral Sea is 2574 km, from conjunction place 1415 km.

Pyandj River almost along all length passes border between Tajikistan and Afganistan.

Amudarya River receives tributaries only within first 180 km. Within 12 km from Pyandj and Vakhsh conjunction place Kunduz River (Afganistan) inflows from the left, within 38 km from the right Kafirnigan River, within 137 km Surkhandarya River, within 180 km Sherabad River.

Amudarya River basin is the largest in area and water availability in this region.

Amudarya belongs to rivers with glacier-snow inflow, area of glaciers on right-bank water catchment areas is 7.3 th. km<sup>2</sup>. Water catchment area is 226.8 th.km<sup>2</sup>.

Within Amudarya basin complex irrigation system is created that counts significant quantity of canals, pumping stations, collectors, and irrigation spillways.

On average basin irrigated area is 3.8-4.0 mln.ha, in 2000 due to low water period basin irrigated area was only 3.56 mln.ha.

With account of morphologous and geographic peculiarities Amudarya basin is divided into 3 reaches: upper (upstream Kelif gauging station border between Turkmenistan and Uzbekistan); middle (between Kelif and Tuyamuyun gauging stations), and lower (downstream Tuyamuyun).

In upper reaches lands of Tajikistan, Uzbekistan (Surkhandarya oblast), and Kyrgyzstan (small irrigated massif in the south of the republic) are irrigated. In upper reaches irrigated massifs are located in valleys of Amudarya basic elements

and tributaries: Pyandj, Vakhsh, Kafirnigan, Surkhandarya, and Sherabad.

In middle reaches largest massifs of present irrigation are concentrated on canals of big length, such as Garagum, Karshi main canal with cascade consisted of 6 pumping stations, Amubukhara Canal. In each canal system some water reservoirs function. Irrigation systems from Kelif to Tuyamuyun receive water by means of dozen canals with water intake without dam.

In lower reaches on both riverbanks big canal system are constructed: Tashsaka, Pakhtaarna, Klychniyazbay, Urgench-Oktyabr-arna, Khan-yab (Sovet-yab), Kyzytken, Suenli.

In amudarya basin there are two large river seasonal storage reservoirs: Nurek on Vakhsh River, Tuyamuyun in lower reaches, and dozen of in-basin and in-system reservoirs.

Basic source providing water demands of agricultural sectors in Amudarya basin, in particular, most water consumptive sector, irrigated agriculture, is surface water resources river flow (its average multiyear volume is 78.4 km<sup>3</sup>/year including Amudarya flow 62.1 km<sup>3</sup>/year).

In Soviet times till 1987 main role in regulation in and management belonged to USSR Minvodkhoz, republican Minvodkhoz, and Upradik (water organization of USSR Minvodkhoz, which is directly subordinated to it, fulfills republican water allocation in lower reaches on base of principles of strict objectiveness. It is located in Urgench.) Presently Upradik is part of BWO "Amudarya" structure.

By the end of 80-ies traditional form of water management in Aral Sea basin had exhausted own potential and started to malfunction in operational management. Therefore according to proposal of republican governments on August 27, 1987 by order of USSR Minvodkhoz Amudarya Basin Division was created in Urgench. It was organization on inter-republican water allocation (Uprvodkhoz "Amudarya"). It was established to improve and increase water management effectiveness within basin by means of transition to basin management principles as well as to provide more operative and actual solution of agricultural problems. Further this division was renamed to Basin Water Organization BWO "Amudarya".

According to common arrangement with basin states BWO "Amudarya" should serve and manage main river trunks:

- Pyandj River trunk;

*Headwork structure  
Khan-yab, Turkmenistan  
(Nizhnedarya Hydrounit  
division)*



- Vakhsh River trunk;
- Kafirnigan River trunk;
- Amudarya River trunk from the beginning to Aral Sea as well as management and operation of interstate main canals with structures located in Amudarya lower reaches downstream Tuyamuyun hydrounit.

BWO should control all pumping stations in trunk of rivers Amudarya, Pyandj, Vakhsh, Kafirnigan and on interstate canals as well as part of river water intakes not transferred to BWO this is Dangara hydrounit at Vakhsh River, Karakum Canal, and Tuyamuyun hydrounit with reservoirs at Amudarya River.

During next two years Tajikistan, Turkmenistan, and Uzbekistan transferred to BWO for temporary use 84 hydrotechnical structures (from them 36 head water intakes), 169 gauging stations, 386 km of interstate canals as well as big quantity communication means for operational needs (roads, communication, power supply, technical means, and oth.).

BWO "Amudarya" was started practically from zero. Besides Upradik (Irrigation Canals Division oldest Minvodkhoz' organization) it was necessary to organize BWO board, territorial operation divisions in upper and middle reaches, and one division in lower reaches in Takhiatash hydrounit zone. Qualified staff should have been selected, and many organizational, economic, social problems should have been solved to promote successful functioning of water organization system.

To create BWO "Amudarya" structure first BWO Head U.A. Ashirbekov and his Deputy A.M. Mukhamedov made big contribution. Under strong support of minvodkhozoes, oblast organizations heads of territorial divisions were selected, buildings for their staff accommodation were provided, and conditions for their functioning. Since 1989-91 head All-union design-research institute "Soyuzgyprovodkhoz" together with Central-Asian institute "Sredazgyprovodkhlpok" prepared Terms of Reference Automation Management System "Amudarya". Within framework of these Terms of Reference development of design-cost-estimate documentation was started, and on base of this documentation since 1989 till 1992 construction of information-computing center building at BWO "Amudarya" in Urgench and also similar building for Nukus Hydrounit Division in Nukus had been conducted. In the same time erection of ultrasonic water flow metering device on headwork structure "Kypchak" was completed. Works on local automation and perfection of water account were



*Barrages of Takhiatash  
hydrounit  
(Nizhnedarya Division)*

started on BWO "Amudarya" head water intakes and big river pumping stations controlled by BWO. Further these works were stopped.

To fulfill established tasks on transboundary water resources management on such enormous area four divisions on operation of water intake structures, hydrounits, interstate canals were created under BWO "Amudarya" with centers in cities Kurgan-Tyube (Tajikistan), Turkmenabad (Turkmenistan), Urgench (Uzbekistan), Takhiatash (Kerakalpakstan).

Territorial divisions' reaches are divided in following way:

- Kurgan-Tyube Hydrounit Division (new name Verkhnedarya Division) operates 8 water intake structures, controls water intakes from rivers Vakhsh, Pyandj, Kafirmigan and on Amudarya River reach with length 246 km to Kelif gauging station;
- Turkmenabad Hydrounit Division (new name Srednedarya Division) controls water intakes at Amudarya River reach with length 552 km, between gauging stations Kelif and Darganata. Division operates 9 big river water intakes;
- Amudarya Inter-republican Canal Division (Upradik) operates 11 river water intakes, 52 hydrostructures on main canals, finances and operates 386 km of main canals, controls water intakes within river reach from Tuyamuyun hydrounit to Kypchak gauging station (reach length 167 km). Three big irrigation systems: Tashsaka, Klychniyazbay, and Kypchak-Bozsu are under Upradik subordination;
- Nukus Hydrounit Division (new name Nizhnedarya Division) operates Takhiatash hydrounit, head water intakes of canals Khan-yab and Jumabaysaka, controls all water intakes from river within reach from Kypchak gauging station to Aral Sea (reach length 283 km).

Organization structure consists of 27 organizations, of which 7 are maintained at the expense of budget, rest belong to self-support organizations. Total staff number on January 1, 2001 was 1353, of them 696 are directly engaged in operations. From total number share of Tajikistan is 83 (6.1%), Turkmenistan 437 (32.3%), and Uzbekistan 833 (61.6%).

Main water management structure is divided into three levels with subordination of lower levels to upper ones in following way:

1. At first hierarchic level BWO (board) takes place directly subordinating to ICWC and decides issues of planning, management, regulation and water

*Right-bank "twin", headwork structure Kyzytken and Bozatau*



allocation among states.

In information aspect BWO is connected with Minselvodkhozes, Minvodkhozes, SIC ICWC, and hydromets of Central-Asian states.

2. Second level is presented by four territorial hydrounit divisions, which supply water to water users according water intake limits plan approved by BWO. Each division includes water sector objects providing water resources delivery, formation, and use within territories' borders.

Territorial divisions are subordinated directly to BWO board.

3. Third level control and management stations (CMS). They are hydrostructures, gauging stations under divisions' operation.

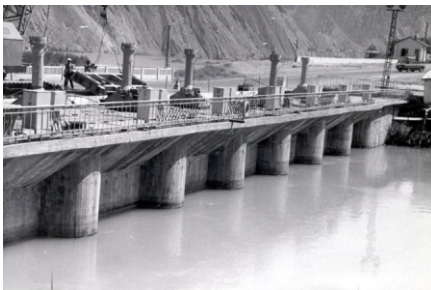
Between BWO board and these divisions operational-supervision communication is organized day and night on rented telephone channels, on radio links.

It worth to underline that transfer of certain functions to BWO on water resources management firstly by USSR Vodkhoz and then governments of CAR republics as well as transition to basin management principle provided certain effect in water use. First of all, elementary order was reached in water resources use account and control; secondly, proportion of unaccounted unproductive water losses both in river and inter-republican main canals reduced; thirdly, specific organization emerged, which is responsible for water use and allocation results. Management system became more flexible and convenient for all parties. Certain level of mutual understanding and confidence was reached in region states' relationships.

After Soviet Union collapse main issue of agenda was how to manage water resources in Central-Asian region further under loosing economic and political space.

Understanding that and following necessity of coordinated and organized decision of question of integrated water management from interstate sources Amudarya and Syrdarya rivers and in purpose of further carrying out coordinated policy in interests of economic development and population living conditions improvement in region on February 1992 members of governments at level of ministers of water management in CAR signed Almaty Agreement and created Interstate Coordination Water Commission (ICWC), which includes two BWOs "Amudarya" and "Syrdarya" as ICWC executive bodies.

So, in the beginning of 1992 in region common for two river basins



*Headwork structure of Vakhsh main canal (Verkhnedarya Division)*

transboundary water management framework was formed.

In fact Almaty Agreement of February 18, 1992 made an attempt to maintain former principles of transboundary water resources allocation in region.

Operational water resources management in Amudarya and Syrdarya river trunks, inter-republican canals was transferred to BWOs.

Tasks on optimal interstate and inter-sectoral water resources distribution were maintained to meet water demands of population and agricultural sectors in accordance with limits approved by ICWC members with account of water availability and environmental situation, and also operational control of keeping water supply limits and all set of organizational-technical measures related to these tasks as well as providing sanitary-ecological releases to Aral Sea and its coastal zone.

BWO "Amudarya" activity is based on BWO Statute approved by ICWC, acting legislation of state-ICWC members, ICWC decisions, agreements, protocols, and other normative acts. BWO has independent balance, rights of juridical person, seal with own name, and special and checking accounts in banks. BWO "Amudarya" is headed by chief approved for this assignment by ICWC decision.

BWO is financed at the expense of subsidies of three states (Uzbekistan in sum, Tajikistan in somoni, and Turkmenistan in manat).

*Within Amudarya basin interstate limited water allocation is fulfilled This is most basic principal provision, on base of which interstate water allocation in Amudarya basin is formed.*

Under new economic and political conditions limits are established for hydrological year (including for growing and non-growing periods) by ICWC.

Water availability assessment, actual water availability account over Amudarya basin is carried out on given flow in supposed Kerky gauge upstream Garagum Canal (Kerky flow upstream Garagum is equal to measured flow in Kerky gauge plus water intakes to Karshi Canal, Garagum Canal, water intakes upstream Garagum to border with Surkhandarya oblast plus water intakes of Surkhandarya oblast plus filling or minus release of Nurek reservoir). This is very typical gauge, which water availability account and forecast was started by Uzglavhydromet in 1974.

*Headwork structure of Turanga Saka Canal*





Recent years this is single possible point for Amudarya water resources assessment, because on rivers Pyandj, Vakhsh, Kafirnigan located in Tajikistan flow account is not carried out because of set of reasons.

Also it worth to note that recent years Surkhandarya and Sherabad rivers lost connection with Amudarya.

BWO "Amudarya" being executive body (ICWC lever) during 10 years working in absolutely new political and economical conditions successfully manages with established tasks in issues of transboundary water management, maintenance of hydrostructures and interstate canals transferred to it.

BWO "Amudarya" positive role and its significance for region is obvious:

1. Basis of basin water management principle was established that was very reasonable decision. Such decision was approved and supported by region states and world community.

2. According to decision of Head of the states of Central Asia about approval of Provision about International Fund for Aral Sea Saving and Agreement about IFAS and its organizations' status adopted in Ashkhabad on April 9, 1999 BWO "Amudarya" status was strengthened. BWO "Amudarya" is official interstate organization.

3. In operation and management activity BWO "Amudarya" obtained following positive results:

- Creation of sufficiently effective functioning organizational structure able to decide main tasks on operative water management and account in time.
- Providing of all BWO organizations with qualified staff.
- Strengthening and maintenance of BWO logistic support.
- Creation of required conditions for normal functioning of its subdivisions.
- Providing comfortable homes for operational staff.
- Due to target work on conducting current and capital repairs headwork river structures, interstate canals with structures are maintained in proper state.
- BWO paid special attention to achievement of order on territories of structures, their maintenance and exterior. Big volume of improvement works was carried out at all structures.
- All interstate canals have proper supervision roads with firm cover.



*Recharge structure  
within 42 km of Shavat  
branch canal*

- Practically on all river water intakes and unit structures of interstate canals there are equipped supervision stations.
- Sufficiently reliable communication is created.
- Practically all structures are electrified.
- Recent years work on computerization and modern equipment purchasing is carried out actively.
- Database on water intakes, hydrology, collector-drainage systems releases, and other parameters.
- In three operational divisions chemical river water analysis is fulfilled regularly.

In spite of reached positive results in BWO work for last years it is required to pay attention to set of issues demanded solution:

1. Renovation of material and technical means (digging machines, transport of different kind, cranes, communication and water account means, motorboats and boats etc.).
2. Solve problem of reserve power supply on headwork river water intakes and big structures of interstate canals.
3. Decide question of staff training and re-preparation according to modern requirements.

It worth to note that within framework of regional interaction on interstate and inter-sectoral transboundary water resources use in Aral Sea basin currently in low water years sufficiently difficult situation is formed that demands adoption of special decisions on strengthening of joint cooperation, first of all, by additional organizational and juridical measures.

ICWC bodies and governments of region states as well BWO board and staff must do following:

1. Jointly achieve following water discipline at all levels of water management;
2. Plan (establish) objectively water intake limits for velayats, states. There are cases of inequitable approach to limits allocation by Ministries at level of administrative territories.
3. Keep coordinated water intake regimes.

*Water Division*



4. Introduce system of sanctions for water discipline violence.
5. Systematically take measures on improving water resources account by using available account means in operational organizations.
6. Create Automated river basin management system.
7. Introduce perfect systems and methods of water account in all links of water supply systems.

To extend existing frames on basin water resources management, which meet international requirements and norms, it is necessary to fulfill following:

firstly, extend BWO reaches on water management;

secondly, strengthen ICWC positions as single interstate basin water management body;

and thirdly, strengthen legal and financial ICWC bodies' status (BWO, SIC ICWC, Secretariat) both regarding ability to carry out activity without barriers on territory of all countries (custom, visa, border and other constraints) and regarding financing of management, maintenance of water regulation objects technical state under operation by interstate bodies.

In spite of available difficulties in water resources management, BWO infrastructure maintenance for recent years certain improvement is observed, range of state-donors expressed willingness to assist BWO on introducing automation, telemechanization, and water account improvement on its water economic objects.



*Financial-Economic Division*

