HANDBOOK ON BASIN PLANNING FOR THE REPUBLIC OF UZBEKISTAN

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PREFACE

Integrated water resources management (IWRM) is one of the priority approaches aimed at sustainable management of natural resources within the framework of the UN-announced International Water Decade for Water «Water for Life» (2005-2015). Introduction of IWRM principles is a long process of improving the decision-making system at all levels of management. One of the main elements of integrated water resources management is the development and implementation of basin plans.

This handbook was developed on the basis of studying world wide experience in the development of such basin plans using practical experience gained in developing basin plans in the countries of Central Asia. Along with the theoretical material, the handbook contains a large set of practical tools that will help in developing a basin plan taking into consideration all modern approaches.

The handbook is a universal methodological document that can be applied in different countries and at various levels, starting from the national level and ending with the local level. This material is intended for decision-makers in the field of planning, government authorized bodies, various water users as well as for any other interested parties.

The development of the handbook was implemented with the support of the European Union in the framework of the Programme «Sustainable management of water resources in rural areas in Uzbekistan: component 1 - National policy framework for water governance and integrated water resources management and supply part» through the «Transboundary Water Management in Central Asia» Programme commissioned by the German Federal Foreign Office and implemented by the Deutsche Gesellschaft für intenationale Zusammenarbeit (GIZ) GmbH in partnership with the Regional Environmental Center for Central Asia (CAREC).

CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

ASB	Aral-Syrdarya Basin
BC	Basin Council
BWO	Basin Water Organisation
DID	District Irrigation Department
GIS	Geographic Information System
EU	European Union
IWRM	Integrated Water Resources Management
UN	United Nations
PES	Payments for Ecosystem Services
MIS	Management of Irrigation System
MMC	Management of Main Canal
UCWU	Union of Canal Water Users
RBMP	River Basin Management Plan
SEA	Strategic Environment Assessment
SIUPWR	Schemes for the Integrated Use and Protection of Water Resources
MWR	Management of Water Resources
CA	Central Asia
ES	Ecosystem Services
EIA	Environmental Impact Assessment.
WCA	Water Consumers Association

INTRODUCTION

International experience in implementing IWRM principles

The concept of «Integrated Water Resources Management (IWRM)» was proposed in 1992 at the International Conference on Water and Environment in Dublin, and was included into the «Agenda 21» at the conference in Rio de Janeiro.

The main goal of IWRM in accordance with Agenda **21 is to meet the demand for fresh water in all countries for their sustainable development**. IWRM is viewed as a process that is particular in each individual case.

The basis of integrated water resources management is the recognition of the interdependence of all types of water use. With this approach, decisions on the allocation and management of water resources take into account the impacts of each type of water use on others and are adopted jointly by all stakeholders. This takes into account the socio-economic and environmental objectives of the development of basins for achieving sustainable development.

Thus, the main goal of IWRM is sustainable management and development of water resources at all levels.

The basic principles of integrated water resources management (or as they are also called the Dublin Principles) has become the basis for subsequent water management reforms in many countries:

Principle 1: Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment;

Principle 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels;

Principle 3: Women play a central part in the provision, management and safeguarding of water;

Principle 4: Water has an economic value in all its competing uses and should be recognized as an economic good.

Based on the Dublin Principles, the European Union developed **Water Framework Directive,** which became the main document in the field of water policy in the EU.

The Framework Directive is a good example of the implementation of IWRM principles and basin planning. The objectives of the Directive are to prevent further deterioration of water quality, to protect and improve the status of aquatic ecosystems and associated wetlands, to promote sustainable use of water, and to manage the processes associated with prevention of flood and drought.

According to the Directive, each EU member

state should define and assign water objects to the river basins on the basis of hydrological watersheds. In each basin, a competent authority should be established, which is responsible for the development of the management plan for this river basin. One of the most important elements of the directive is the involvement of the public and stakeholders in the management process.

The abovementioned elements of the EU Water Framework Directive are fundamental for the implementation of IWRM and basin planning in EU countries. During the Soviet period, the state defined water management policies (water policy) in Central Asian countries. On a regular basis, general schemes for the Integrated Use and Protection of Water Resources (SIUPWR) were established.

In particular, during the Soviet period, with the involvement of a number of design and research projects from the «Sredazgiprovodkhlopok» Institute, the «Amdarya Complex Use and Conservation Scheme» was developed in 1984 and the «Syrdarya Complex Use and Protection of Water Resources Scheme» in 1987.

These schemes were the basic documents governing the management and distribution of water resources of the AmuDarya and SyrDarya, as well as determining the development of water management in the countries of Central Asia.

After the collapse of the Soviet Union, the water management systems in each of the Central Asian countries underwent certain changes. Nevertheless, in the Nukus Declaration, adopted by the countries of the region in 1995, the Heads of Central Asian countries noted that «We (ed., the countries of Central Asia) agree that the Central Asian states recognize previously signed and existing agreements, treaties and other normative acts regulating the mutual relations between them on water resources in the basin of the Aral Sea and take them to steady implementation." However, after the disintegration of the Union, due to a change in the priority of countries on the use of water resources and financial capabilities, the above schemes were not observed and were not fully implemented.

It should be noted that the countries of the region still use and give preference to the old methods of management and use of water resources that can lead to inefficient use of water resources. In particular, the management of water resources on the basis of administrative division leads to the prevalence of local interests, rather than the interests of the entire basin development. Planning is carried out by separate departments, and various stakeholders do not always have the opportunity to participate in the decision-making process due to the lack of a regulatory mechanism, despite the fact that the opportunities for participation are enshrined in the water laws of Central Asian countries. Such an approach does not allow taking into account the interests of all parties and leads to the failure to fulfill necessary obligations, to water losses due to inconsistency of actions or to conflict situations. When managing water resources, environmental issues are not always of high priority and often, they are not solved. It is obvious that the introduction of IWRM principles is aiming at the solution of the above tasks and allows creating certain conditions for effective management of water resources.

The most important advantage of IWRM is the functioning of the mechanism of interagency coordination through the establishment of basin councils or coordination groups. This approach allows ensuring a clear coordination and synergy of actions at all levels of the management hierarchy.

The first principle of IWRM - basin management based on hydrographic boundaries - is a guarantee of stable and equitable water supply regardless of the location of the water user (higher or lower downstream).

Broad public participation in the planning process, including through consultation with the public, makes it possible to take into account the interests of all water users. Great

importance is attached to the formation of public opinion on the need to conserve water resources and introduce incentives to increase the efficiency and productivity of water use.

At the same time, the Central Asian countries have not abandoned the use of SIUPWR for planning the development of territories. However, the existence of SIUPWR and basin plans is simultaneously justified, as there are certain differences between the approaches to the development and content of these documents. Below in Table 1, a comparison of the main characteristics of the SIUPWR and basin plans is presented.

Table 1

Comparison of the main characteristics of the SIUPWR and basin plans

	Basin planning	Complex schemes
Scale and style of water resources management	Pools, sub-basins of all sizes and scales. In general, decentralized MWR	National, main river basins. Public administration, centralized MWR
Participation of stakeholders	Participation in the development of the basin plan	Informing about the most important elements of the scheme
Technical solutions in comparison with institutional projects	Both options are balanced	Technical solutions dominate
Ecological aspects of MWR	Priority	Considered along with other sectors
Financial / economic aspects	Detailing at the level of each event, different sources of funding, economic instruments	Single funding for all activities, mainly state financing, payments for environmental pollution - one of the financial instruments

As can be seen in Table 1, the presence of the developed SIUPWR in the basin is not an obstacle to the development a basin plan. The basin plan is more a «living» document and can be based on research and the calculations laid down in the SIUPWR. In the Central Asian countries, when funding from the state budget is limited, basin plans are most suitable for implementation due to the possibility of decentralizing funding and searching for new financial sources.

Conceptual and methodological approaches to the development and implementation of basin plans

In international practice there are numerous methodological approaches used in the development of basin plans. Below there are methodological approaches approved in the water economy that can be used to some extent in the development of basin plans.

For example, the main purpose of **the cross-border monitoring system**[1] is to identify and develop optimal strategic options for basin planning taking into account the political, socio-economic and ecological development of the basin. The cornerstone is to determine mutual benefit of all proposed activities for the parties. This methodological tool, as a rule, is used by joint river basin organizations to study topical issues and choose optimal solutions. It should be noted that development factors can be added to suit each individual case.

1 Phillips, D.J.H., Allan, J.A., Claassen, M., Granit, J., Jägerskog, A., Kistin, E., Patrick, M., and Turton A. (2008).The TWO Analysis: Introducing a Methodology for the Transboundary Waters Opportunity Analysis. Report 23. Stockholm International Water Institute (SIWI): Stockholm, Sweden

Another example is **the Strategic Environmental Assessment (SEA)**[2], which is one of the main tools used both at the stage of analysis and involvement of all stakeholders and at the planning stage. SEA aims at identifying priority environmental aspects of proposed activities.

The assessment allows the use of various tools, such as analysis of basin development scenarios, risk assessment, modeling and forecast of possible environmental impacts, and economic calculations to identify optimal measures. SEA is mainly used in the process of developing a basin plan to identify pressing topical problems of an ecological character of the basin and to consider optimal preventive measures.

Each of the methodological approaches used is intended for specific purposes. Elements of different approaches can be used simultaneously.

The basis of this **handbook is the concept of basin planning**[3], developed within the framework of the Program «Support to Water Management and Basin Organizations in Central Asia» (WMBOCA)[4], implemented by GIZ and funded by the European Union.

The concept is based on the European Union Water Framework Directive and contains a number of principles used in other methodological approaches described earlier. Thus, when developing the Basin Plan, the hydrographic basin of the watercourse is taken as a unit. The integrated assessment and analysis of the current situation in the basin is fundamental. Much attention is paid to involving stakeholders and the public in the process of basin planning.

At the same time, it should be emphasized that the development of this handbook has been carried out taking into account the national legislation and the basics of water resources management in the Republic of Uzbekistan.

2 SEA – Strategic Environmental Assessment. World Bank (2009). Strategic Environmental Assessment-Improving Water Resources Governance and Decision Making: Case Studies, Paper No. 116., Washington, DC, USA

3 The document can be found on the website of the Program http://www.waterca.org/resources/reports

4 Activities financed by the European Union («Support for Water and Basin Organizations in Central Asia (WMBOCA)») are implemented during the second phase of the GIZ program «Transboundary Water Resources Management in Central Asia», operating in the region on behalf of the German Foreign Ministry.

CHAPTER 1. MANAGEMENT AT THE BASIN LEVEL AND THE ROLE OF BASIN ORGANIZATIONS IN THE DEVELOPMENT AND IMPLEMENTATION OF BASIN PLANS

1.1. Existing basin organizations at the basin level. Their advantages and disadvantages

1.1.1. International experience

One of the main principles of IWRM and basin planning is the creation of a certain organizational structure, through which basin plans are developed and implemented.

A number of different forms of such institutional structures exist in the world. In some cases, these are informal organizations that are advisory bodies, in other cases they are formal basin organizations. In total, eight types of organizations are distinguished.

Basin organizations differ in structure and function.

The most common types of basin organizations are Committees, Commissions, Water Management Organizations and Councils.

Each of the types presented has its own specifics and is suitable for working under certain conditions. At the same river basin, various basin organizations can be established, depending on the functions and the level of management.

One such example is the Colorado River basin in the United States, where water quality control councils have been established and are functioning.

Table 2

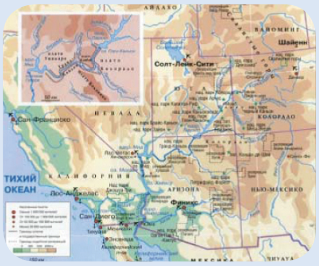
Types of basin organizations[5]

Types of basin organizations	Structural features and functional responsibilities
Type 1: Committee	Consultative and advisory body, consisting of groups of representatives of countries that are members of the committee. Functional duties: development of general principles and discussion of topical issues of a general nature or on specific topics in the basin. Parminent committee staff is not provided

5 Hooper, B (2006) Key performance indicators of river basin management Alexandria, VA: Institute for Water Resources, US Army Corps

Type 2: Water Management Organization	Authorized body for the performance of all works in the basin. Decisions are binding for the authorities in respective countries. Permanent staff of the organization is provided
Type 3: Association	Public organization. Functional duties: education and information on general issues in the basin
Type 4: Commission	Authorized body, members are delegated by the parties-participants. Functional duties: implementation, coordination and monitoring of all works in the basin, as well as fulfillment of obligations of countries under international agreements. Designated staff and technical secretariat
Type 5: Council	Intersectoral is stakeholder group with involvement of the public. Functional duties: discussion and coordination of topical issues in the basin, development of basin plans, monitoring of implementation. Usually created at the level of sub-basins or hydrographic areas. Upon available finding has a secretariat
Type 6: Corporation / Joint Stock Company	Legal entity for the performance of all works in the basin on a commercial basis
Type 7: Tribunal / Arbitration	Judicial authority on the management of the basin. Functional duties: resolving disputes between water users and water consumers
Type 8: Federation	Association of different representatives of stakeholders to coordinate positions, develop basin plans, implement and monitor work, exchange information and promote best practices

Strategic Planning and Management of the Colorado River Basin



The Colorado River basin is one of the most diverse basins in North America, covering an area of 629,000 km², and the length of the river is 2330 km. The river originates in the Rocky Mountains, where the height reaches 4300 m, then flows through Mexico and into the Gulf of California, forming a delta. The entire basin of the Colorado River is divided into seven large regions, representing large sub-basins. Appropriate concepts, rules and procedures for management have been developed for each of the seven regions. The management of this large basin requires a specialized basin structure, and the development of basin plans - compliance with certain rules.

On the territory of the whole basin, nine Regional Councils have been established, which operate in close cooperation with the administrations of the districts and the responsible department on the part of the state. Each Regional Council has the right to make decisions on setting standards, issuing permits for wastewater discharges, monitoring compliance with these permits, and taking appropriate actions in case of their non-compliance.

Each Regional Council for Water Quality of the Colorado River Basin has a dedicated website, on the pages of which each interested party can access special information on various parameters of water quality. A formal basin plan for the entire basin of the Colorado River does not exist. However, each Regional Council is developing a «Strategic Plan» for the management of water quality in the basin, in the framework of which the Watershed Initiative for the Colorado River is being developed.

The main principle of developing strategic plans is the application in practice of integrated management of natural resources, balanced with economic and other interests.

Thus, basin planning in the Colorado Basin is an integrated process, including monitoring, identification of priority water issues in sub-basins and regions, development of strategic objectives and implementation of measures on specific thematic issues. However, it should be noted that specific basin organizations, in addition to the above-mentioned Councils, have not been established in the basin of the Colorado River. The main responsible organizations are administrations that work in close cooperation with the Environmental Protection Agency in each of the states.

1.1.2. Experience of Central Asia

Despite the fact that there are basin organizations in Central Asia, they are mainly focused on the distribution of water resources and do not consider the management of the basin as a whole. Basin organizations that could implement the principles of IWRM and basin planning are still few. However, already now there are a number of examples of the creation of such organizations. The forms of organizations vary, cover different levels, but can serve as models for further dissemination in the region.

The first example is the Union of Canal Water Users (UCWU), which was established in the Fergana Valley as part of the IWRM-Fergana Project[6].

As an alternative to the existing organizational structure of management of pilot canals on the administrative-territorial principle, when moving to IWRM, a public body with structural subdivisions was established. Initially, it was planned that this would be only a public body, but this approach led to a number of problematic issues. In this connection, in accordance with the procedure established by law, the UCWU of the pilot channels acquired the status of a legal entity.

The organizational structure of the UCWU is as follows:

- The General Assembly of the UCWU is the supreme body of the UCWU.
- The UCWU Council (formerly WCC (Water Canal Committee)) is the executive body of the UCWU.
- The Board of the UCWU Council is the working body responsible for the current activities of the UCWU Council.

UCWU is an example of addressing water distribution issues through the involvement of all stakeholders. The UCWU includes representatives of water users, water management organizations, local authorities and other parties interested in the use of water resources.

Uzbekistan as one of the first countries of Central Asia implemented the transition to basin water management. In accordance with the decision of the Government in 2003, the transition of water management from administrative-territorial to basin management was implemented in Uzbekistan. In particular, basin irrigation system authorities (BISA) and irrigation systems management were established on the basis of oblast regional water management organizations.

The main task of the BISA is the organization of targeted and rational use of water resources based on the introduction of market principles and mechanisms for water use and water consumption. The BISA is responsible for implementing a unified policy in the regulation and use of water resources in a particular water basin. In addition, the BISA is entrusted with such tasks as the implementation of a unified technical policy in the water sector based on the introduction of advanced technologies, the organization of uninterrupted and timely provision of water to consumers, ensuring the technical reliability of irrigation systems and water management facilities, rational water resources management in the basin and increasing its efficiency, ensuring reliable accounting and reporting of the use of water resources in the context of water users and water consumers.

Thus, the management of water resources and water management are carried out basin-wise.

The Basin Councils consider current issues in the use and protection of water resources, water supply and sanitation. The organization of the work of the Basin Councils is entrusted to the basin management.

The Basin Councils in Kazakhstan include from 30 to 45 members: representatives of state structures, the main water users of the basin,

6 Web page of the project on Intigerated water resources management in Fergana valley http://iwrm.icwc-aral.uz/

non-governmental organizations, and experts. Meetings of the BC are held on a regular basis 2 times a year, and since 2008 are included in the state financing program.

According to the Water Code of the Republic of Kazakhstan, River Basin Councils can and should conclude Basin Agreements, which may involve large water users, representatives of local authorities, non-governmental organizations and other interested parties.

The competence of the Basin Councils also includes the development, implementation, approval and monitoring of the implementation of the Basin Plan. Such Basin Plans have already been developed for the Aral-Syrdarya and Balkhash-Alakol Basins.

Central Asia has experience in creating institutional structures at a transboundary level. A striking example of this is the Chu-Talas Water Commission between the Republic of Kazakhstan and the Kyrgyz Republic. This Commission has a solid legal and institutional basis. The Commission carries out its activities on the basis of the «Agreement between the Government of the Republic of Kazakhstan and the Government of the Kyrgyz Republic on the use of water management facilities for interstate use on the rivers Chu and Talas», concluded in 2000 between Kazakhstan and Kyrgyzstan. In order to coordinate joint actions and implement the provisions of the Agreement, the Commission has a permanent Secretariat. The structure of the Commission is shown in Figure 1.

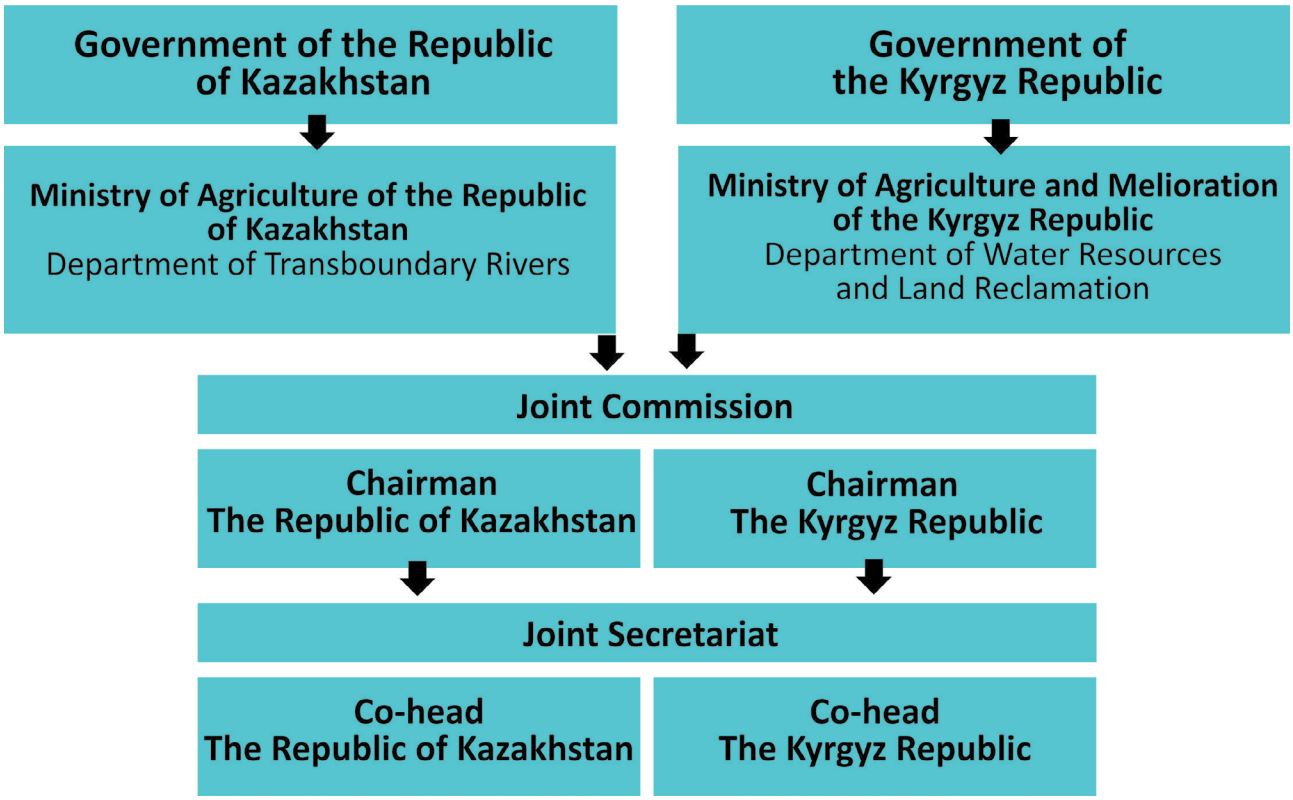


Figure 1. Structure of the Chu-Talas Water Commission between the Republic of Kazakhstan and the Kyrgyz Republic

Another example is the Joint Water Commission and the Basin Committees for the Cooperation and Use of International Rivers, established by the Governments of the Kyrgyz Republic and the Republic of Tajikistan (with the support of the GIZ program «Transboundary Water Management in Central Asia»)[7].

Considering that the basin institutions are a platform for implementing institutional and technical measures for basin planning and management, the following joint organizations were proposed: the commission, basin committees and secretariats. The proposed structure is presented below in Figure 2.

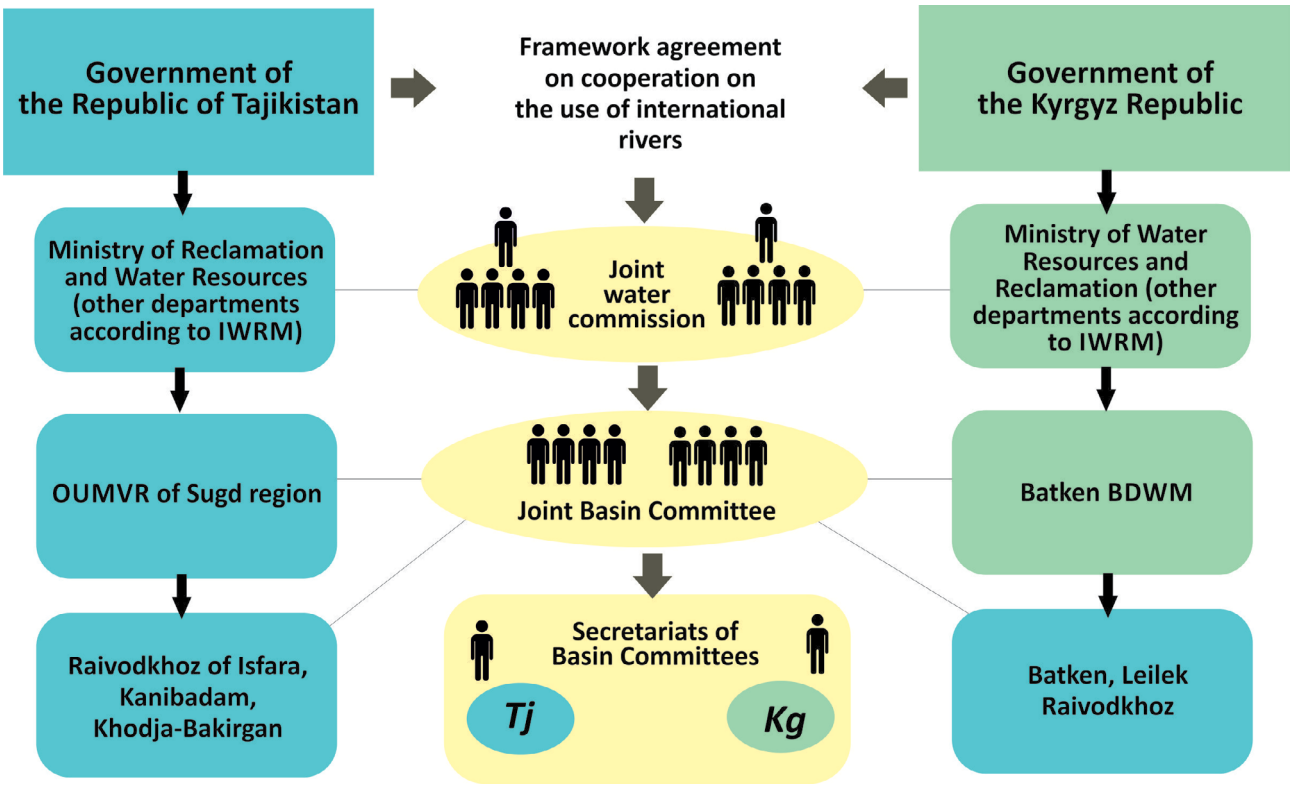


Figure 2. Proposed organizational structure for the cooperation and use of international rivers between Kyrgyzstan and Tajikistan

In terms of joint water use, Uzbekistan and Turkmenistan are also successfully cooperating in the management and use of the water resources of the Amudarya River, as well as in the use of interstate water management facilities. In particular, bilateral agreements on joint water use have been signed, including the «Agreement between the Republic of Uzbekistan and Turkmenistan on cooperation in water management issues» of 1996, which defined the legal framework for cooperation between the two countries in the use of water resources in the middle and lower reaches of the Amudarya River. In addition, on the basis of the «Agreement on the joint use of water resources by Turkmenistan and the Republic of Uzbekistan in the lower reaches of the Amudarya River» from 2007 for the purpose of operative management of the lower reaches of the Amudarya River, the parties established a joint technical group from among the representatives of Uzbekistan, Turkmenistan and BWO «Amudarya». The meetings of the technical group are held periodically and their decisions are formalized by protocol decisions, which are binding on both sides. The scheme of cooperation within the technical group is shown in Figure 3.

7 Programme's document can be found http:// www.waterca.org/programme/c2/isfara-kb

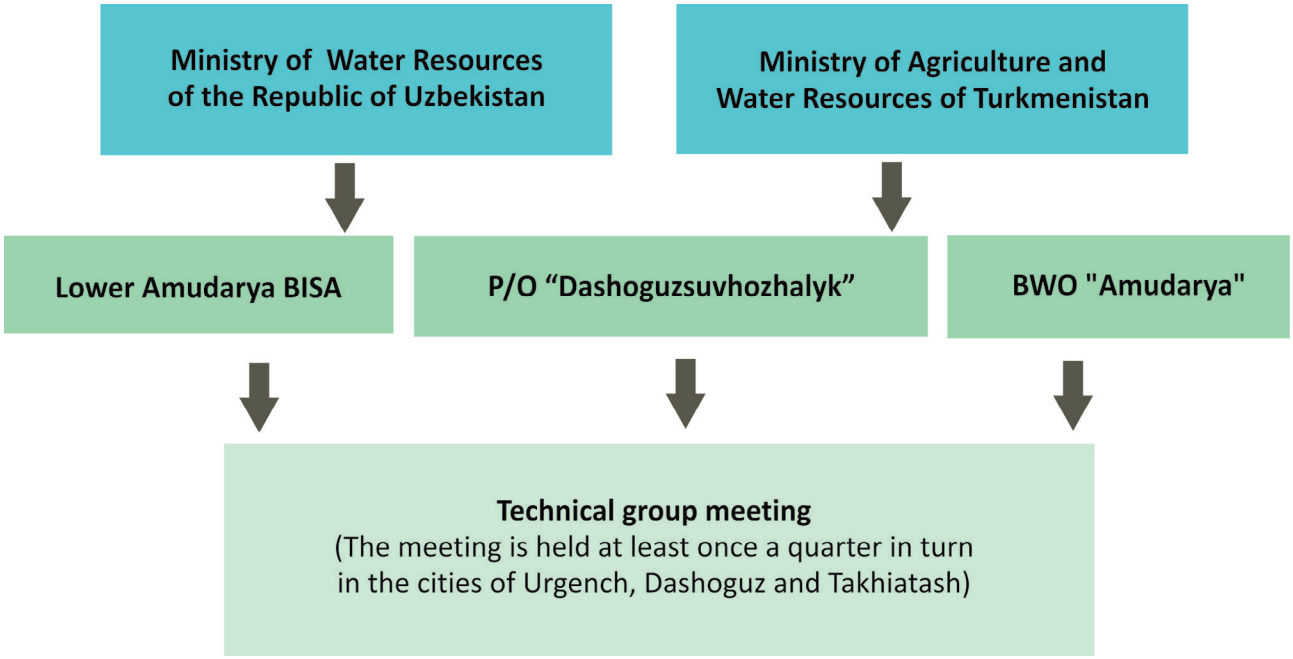


Figure 3. The cooperation scheme between Uzbekistan and Turkmenistan within the framework of the technical group on joint management of water resources of the lower reaches of the Amudarya River

The experience in Central Asia demonstrates various opportunities for introducing IWRM principles and basin planning. The above structures show that in Central Asia there are not only preconditions for the creation of such organizations, but also positive examples of the introduction of basin planning.

1.2. Legal management capabilities at the basin level in Central Asian countries

The basis of water legislation in the countries of Central Asia consists of the Water Codes:; in Uzbekistan, the main legislative act in the field of water use is the Law of the Republic of Uzbekistan «On Water and Water Use». Each of the codes and laws to some extent contain opportunities for the implementation of IWRM principles and basin planning.

Below is a summary table reflecting the elements of IWRM and basin planning in the water legislation of the countries of Central Asia (tab. 3).

As the analysis of the regulatory framework of water management has shown, in all countries of the region more or less elements of IWRM, of basin planning and of involvement of stakeholders in the planning and decision-making process are existing to some extent.

However, it should be noted that the legislation of the countries is constantly being improved and more attention is paid to IWRM and basin planning issues.

Table 3

Elements of IWRM and basin planning in the water legislation of the countries of Central Asia

Principles of IWRM and Basin Planning	KAZAKHSTAN Water Code of the Republic of Kazakhstan (09.07.2003 with amend. of 25.01.2012)	KYRGYZSTAN Water Code of the Kyrgyz Republic (12.01.2005 with amend., of 10/10/2012)	TAJIKISTAN Water Code of RT (10.11.2000 from rev. of 16.04.2012)	TURKMENISTAN The Code «On water» (15.10.2012)	UZBEKISTAN The Law «On Water and Water Use» (06.05.1993 as amended in 2016).
Coverage of all water resources (state water fund)	chapter 1, article 4	chapter 1, article 4	chapter 1, article 4	chapter 1, article 3, 4	Chapter 1, Article 4. Chapter 16, Article 107
Public participation, gender aspects	chapter 1, article 9; chapter 5, article 33; chapter 12, article 63	chapter 1, article 6	chapter 1, article 13	chapter IV, article 11	Chapter 3, Article 1, 10
Horizontal and vertical coordination	chapter 5, article 33; chapter 7, article 40; chapter 9, articles 48-49	chapter 2, articles 7-10	chapter 1, articles 6-7	Chapter II, Article 7, 8, Chapter III, Article 10	Chapter 2, Articles 5-7, Chapter 3, Articles 8-9
Management of water resources and basins, planning (integrated water resources management and protection scheme, water balance)	chapter 5, article 34; chapter 7, articles 40-43; chapter 8, articles 44, 47	chapter 1, article 5; chapter 2, articles 9, 10; chapter 3, article 20	chapter 1, article 2, 9; article 69, article 74; chapter 23, articles 138, 139	chapter 13-14 chapter XXIV, articles 101-102	Chapter 16, articles 108-112

1.3. Legal and Institutional Basics of Basin Management in the Republic of Uzbekistan

The sources of water law that form the water legislation of the Republic of Uzbekistan (RUz) are the following legal documents:

- Constitution of the Republic of Uzbekistan.
- Laws and other normative acts of Uzbekistan in the field of water use and environment protection.
- Decrees and orders of the President of Uzbekistan and resolutions of the Cabinet of Ministers of the Republic of Uzbekistan.
- Normative acts of ministries and departments.
- Normative acts of local authorities.

The Constitution of the Republic of Uzbekistan establishes the foundations of the public and state system, the fundamental rights and freedoms of citizens, the form of property and other fundamental provisions that are fundamental to the legal regulation of water relations. According to the Constitution, «the land, its mineral wealth, flora and fauna and other natural resources are national wealth, are subject to rational use and protected by the state», which implies a close

relationship between the careful attitude to natural resources and their rational use. The Constitution also defines the organizational and control functions of higher and local authorities on the rational use and protection of natural resources, which are developed in special legislation.

The Law of the Republic of Uzbekistan «On Water and Water Use» (1993) underpins the country's water legislation. The objectives of this law are to ensure the rational use of water for the needs of the population and sectors of the economy, protect water from pollution, debris and depletion, prevent and eliminate harmful effects of water, improve the state of water objects, and protect the rights and legitimate interests of enterprises, institutions, organizations, farmers, dehkan farms and citizens in the field of water relations.

Among other things, the following laws should be considered as a legal basis for water relations:

- Law of the Republic of Uzbekistan «On Nature Protection» (1992).
- Land Code of the Republic of Uzbekistan (1998).
- Law of the Republic of Uzbekistan «On Agricultural Cooperative (Shirkat)» (1998).
- Law of the Republic of Uzbekistan «On farming» (2004).
- The Law of the Republic of Uzbekistan «On Dehkan Farm» (1998).
- The Law of the Republic of Uzbekistan «On the Safety of Hydraulic Structures» (1999) and others.

Also, decrees, orders and decisions of the President of the Republic of Uzbekistan, resolutions of the Cabinet of Ministers affect a wide range of water relations. In many respects, water relationships and regulation of water management issues are implemented by various provisions and procedures that are approved by the relevant resolutions of the Cabinet of Ministers of the Republic of Uzbekistan.

In particular, the main normative acts in the field of regulation of water relations are the following:

- «Regulation on the order of water use and water consumption in the Republic of Uzbekistan» (approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 82 of March 19, 2013) - this provision determines the order of water use and water consumption in the territory of the Republic of Uzbekistan, and is practically considered the second legal document in the field of water relations after the Law «On Water and Water Use»;
- «Regulations on the procedure for issuing permits for special water use or water consumption» (approved by Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 171 of June 14, 2013) - this provision establishes the procedure for issuing permits for special water use or water consumption when using surface and groundwater in the territory of the Republic of Uzbekistan;
- «Regulations on the procedure for introducing and financing the drip irrigation system and other water-saving irrigation technologies» (approved by the Cabinet of Ministers of the Republic of Uzbekistan decision No. 176 dated June 21, 2013) - this provision determines the procedure for the formation and approval of the state program and territorial targeted programs for the introduction of drip irrigation and other water-saving technologies of irrigation. This government decree provides a number of benefits and preferences for water users, water consumers and producers in order to stimulate the introduction of water-saving technologies.

In terms of institutional reform of the water

Resolution of the Republic of Uzbekistan «On measures to further improve the organization of activities of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan «for No. OP-3172 dated August 4, 2017, in accordance with which the water management measures to further improve the organization of activities of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan No. OP-3172 dated August 4, 2017, improved the water management system.

In addition, an important document in the basin management plan is the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan «On improving the organization of water management» No. 320 dated July 21, 2003, according to which the transition from the administrative-territorial principle of water resources management to the basin principle was implemented.

In order to ensure transparency and objectivity in the water allocation and control of the use of water resources, basin water management councils have been established for each basin management of irrigation systems, and for the management of irrigation systems - working commissions, which include representatives of all sectors of the economy. In addition, the Ministry of Agriculture and Water Resources of Uzbekistan established a Council on the rational use of water and land resources, the development of irrigation and the increase of soil fertility.

In addition, water consumer associations (WCAs) have been established at the grass-roots level of water management to regulate water relationships between farms and state water management organizations. The establishment of WCAs has become one of the main achievements of reforming water resources management at the local level. The process of WCA formation in the republic has developed actively and today 1503 associations

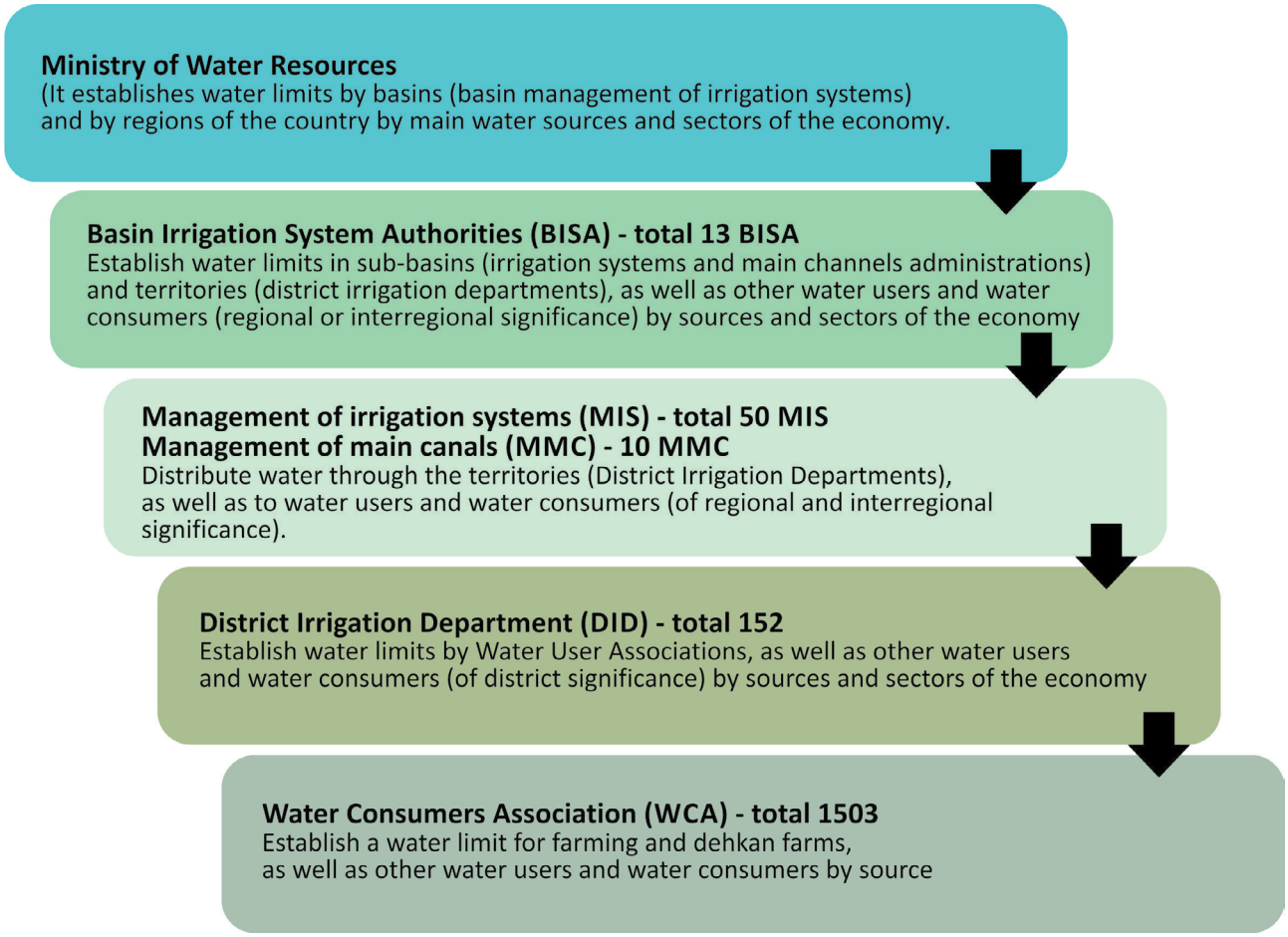


Figure 4. Water management scheme in Uzbekistan

of water consumers function in the republic. WUAs provide water services to more than 81.500 water users with coverage of 3.73 million hectares of irrigated land.

The above changes in water management have made it possible to ensure a more efficient, stable and even distribution of water at all levels. The scheme of water resources management is shown in Figure 4.

The analysis of regulatory and legal documents of the Republic of Uzbekistan shows that the national water legislation has the necessary legal norms and a legal basis for the implementation of IWRM and basin planning. As can be seen from Figure 4, in the institutional plan, the management and distribution of water resources in Uzbekistan fully corresponds to the basin principle. At the same time, the hierarchy of management of water resources in Uzbekistan also has elements of the administrative-territorial principle, which is important in the present conditions, when the local authorities (hokimiyats) have great powers in all aspects of the economy, including the water management. Thus, a separate article (Article 7) of the Law of the Republic of Uzbekistan «On Water and Water Use» defines the competence of local authorities in the field of regulation of water relations.

ELEMENTS OF IWRM AND BASIN PLANNING IN THE LAW OF THE REPUBLIC OF UZBEKISTAN "ON WATER AND WATER USE" (May 6, 1993 as amended on December 26, 2016)

ELEMENTS OF IWRM

Coverage of all water resources

Article 4 (Chapter 1): The Unified State Water Fund

«The Unified State Water Fund includes:
- streams, sais, rivers, reservoirs, lakes, seas, canals, collector-drainage networks, springs, ponds and other surface waters;
- underground waters, snow reserves and glaciers

The right to use water from transboundary water bodies (the Amudarya, Syrdarya, Zarafshan, Aral Sea and other transboundary water bodies) is established by international treaties of the Republic of Uzbekistan».

Public participation

Article 10 (Chapter 3): The participation of WCAs, other non-governmental non-profit organizations, as well as citizens in the implementation of measures for the rational use, protection of waters and water objects:

«WCAs, other non-governmental non-profit organizations, in accordance with their charters and citizens, assist state bodies in implementing measures for the rational use, protection of waters and water objects. State bodies in carrying out these activities may take into account the proposals of WCAs, other non-governmental non-profit organizations, as well as citizens».

BASIN PLANNING

Article 108 (Chapter 16) - Planning of water use and protection:

«Planning of water use should ensure scientifically based water distribution among water users, taking into account the priority satisfaction of drinking and household needs of the population, protection and prevention of their harmful effects. The data of the state water cadastre, water balance sheets, integrated water use and protection schemes are taken into account when planning the use of water.»

Article 109 (Chapter 16) –State water cadastre:

«The state water cadastre includes data on water accounting for quantitative and qualitative indicators, registration of water use, as well as water use accounting data.»

Article 110 (Chapter 16) – Water balances:

«Water balance sheets are compiled for river basin irrigation systems and economic areas by river basins to assess the availability and extent of water use ...»

Article 111 (Chapter 16) - Schemes of integrated use and protection of water:

«General and basin (territorial) schemes for the integrated use and protection of water determine the main water management and other measures to be implemented to meet the long-term needs in water of the population and economic sectors, as well as to protect water and prevent their harmful effects.»

CHAPTER 2. DEVELOPMENT OF BASIN PLANS THE CYCLE OF BASIN PLANNING

2.1. Water Resources Planning Process: Planning Cycle

As we observed in the previous chapters, in modern conditions great attention is paid to an integrated approach to solving water problems. At present, it is impossible to address issues without considering their impact on economic, environmental and social aspects simultaneously. Basin planning is an important element of Integrated Water Resources Management (IWRM), which can be applied at various levels, including on a transboundary basis.

As stated earlier, the Law of the Republic of Uzbekistan «On Water and Water Use» provides for the management and use of water resources on the basis of basin (territorial) schemes for the integrated use and protection of water (basin plans) that define the main water management and other activities to be implemented to meet future needs in the water of the population and sectors of the economy, as well as to protect water and prevent their harmful effects.

The development and implementation of basin plans allows the water management (basin) organizations to carry out a comprehensive analysis and assessment of the existing water management situation, to implement water use planning for the basin for short-term (2-3 years), medium (5-7 years) and long-term (10-15 years) prospects. Within basin planning possible trends of economic development, demographic projections, increasing signs of the impact of climate change and other factors affecting the development of basins are taken into cinsideration.

The development of the IWRM plan requires compliance with the basic principles that make plans the most viable and effective. The basis is the process, or as it is also called the planning cycle.

Such planning cycles are used in any management system, whether it is basin management or individual enterprise management. The IWRM plan, developed on the basis of the planning cycle, can be used at any level, from the state and interstate levels, to the basin of any small river.

As shown in the diagram below, the current planning cycle for IWRM contains 7 main stages (Fig. 5).

Each of the stages will be discussed in detail in the following chapters of this manual.

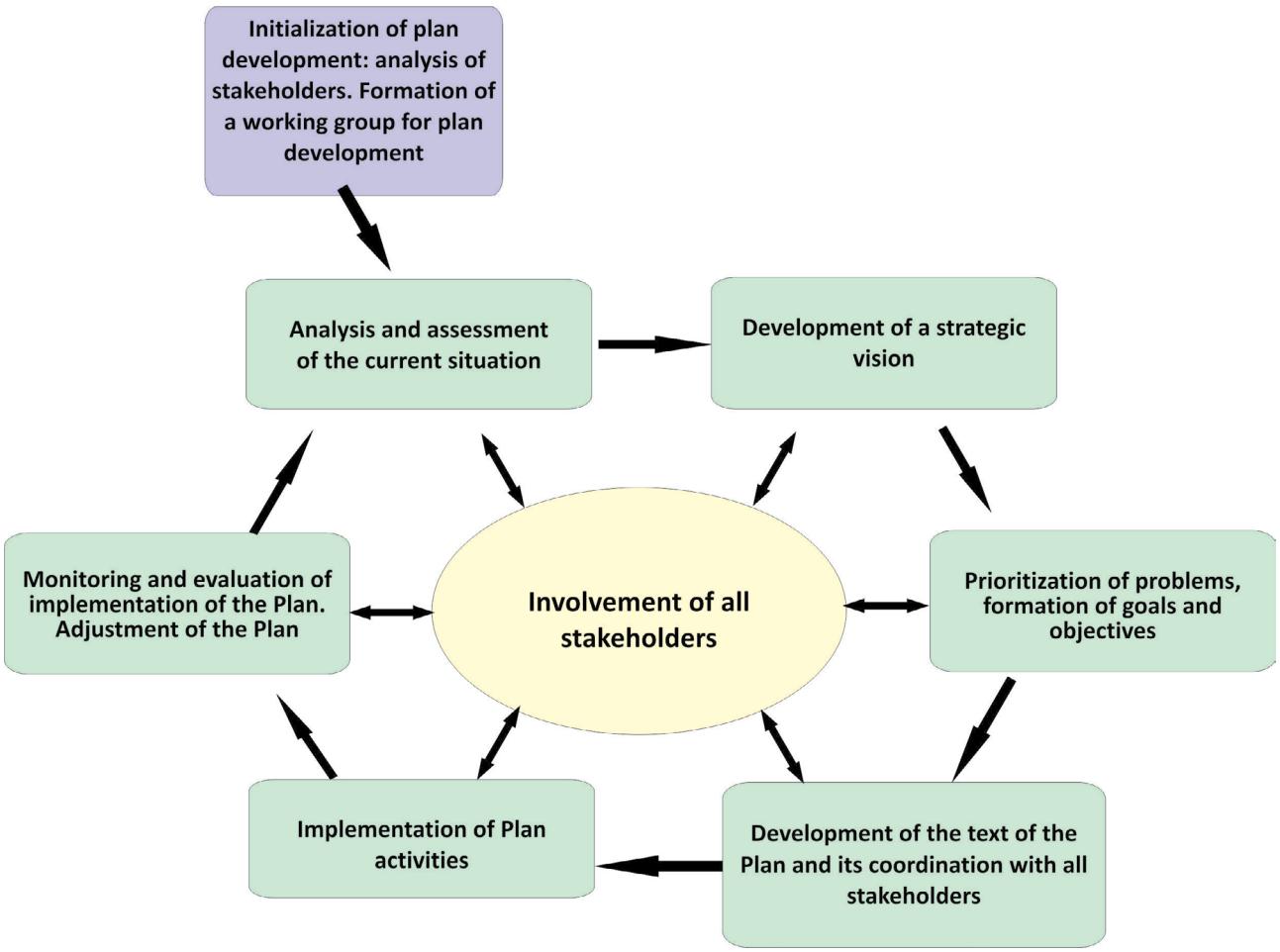


Figure 5. Basin planning cycle

2.2. Analysis of stakeholders

Stakeholder involvement is key at all stages of the development and implementation of the basin plan.

When forming the list of stakeholders, the specifics of management in the given territory, existing branches of the economy, public organizations, environmental aspects, potential emergency situations, etc. are taken into account.

Participation of each of the interested parties allows defining and formulating existing problems in all sectors, setting priorities and identifying possible solutions, taking into account the interests of each.

An important aspect in water resources management and water use planning is the distribution of water limits. In this plan, in accordance with the «Regulation on water use and water consumption in the Republic of Uzbekistan» approved by Resolution of the Cabinet of Ministers No. 82 of March 19, 2013, the water withdrawal limits are established in the following order of priority:

- Drinking, medical and communal households.
- Industry.
- Agriculture.
- Sanitary and environmental releases.

At the same time, water withdrawal limits, set for the needs of landscaping, sports and recreational facilities are equal in priority to communal needs.

At the same time, each interested party should clearly understand the benefits of participating in the planning process and, subsequently in implementing the plan.

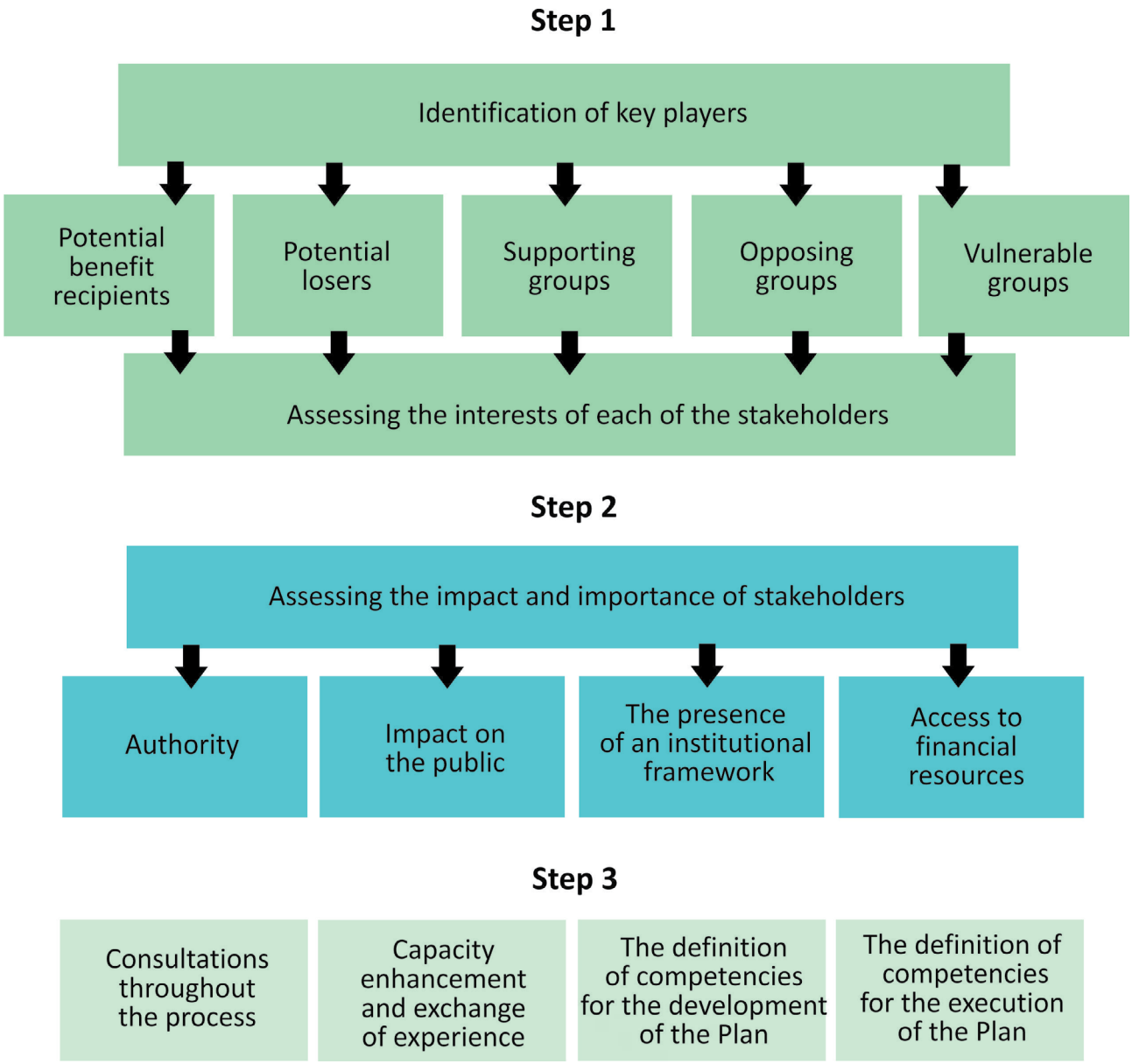


Figure 6. Stakeholder Engagement Steps

Benefits of stakeholder involvement in the planning process:

- Sound decision-making through knowledge.
- The main stakeholders are more affected by lack of water resources or poor water management.
- Consent in the early stages of Plan development reduces the likelihood of conflicts in the future.
- Transparency of public and private activities.
- Ensuring trust between all participants of the process.

The views and interests of the involved stakeholders do not always coincide and may conflict. It is necessary to find a compromise between the participants in the process and to come to coordinated decisions. The adoption of coordinated decisions contributes to their more effective implementation.

2.3. Strategic vision. Stages of vision development

The basis for basin planning is a governmental goal, i.e. the development of a policy and strategies, in other words **«the formation of a vision».**

> VISION is the main long-term goal of the development of the basin. Strategic vision is a document that describes the prospects for the development of the basin. A strategic vision is focused on a given long-term period, usually 20-25 years.

According to the Law «On Water and Water Use» (Article 108) *«planning of water use should ensure scientifically based water distribution among water users, taking into account the priority satisfaction of drinking and household needs of the population, protection and prevention of their harmful effects.»*

In this context, the law determines that (Article 111) *«General and basin (territorial) schemes for the integrated use and protection of water determine the main water management and other measures to be implemented to meet the long-term water needs of the population and sectors of the economy, as well as to protect water and prevent their harmful effects.»*

Taking the Law into consideration, the basis for developing a strategic vision could be:

- Official political statements in the form of documents approved by the government.
- Strategies for the development of the state, as well as strategies and plans for the development of the territories.
- Programs for the development of individual industries, incl. water sector.
- International obligations.

The vision must be representable and desirable, realizable at a certain time and focused on certain issues. The vision should be accessible to all stakeholders.

The development of a strategic vision includes several mandatory steps:

1. Analysis of the existing water policy and strategy for compliance with sustainable development approaches and IWRM principles.
2. Analysis of available resources and needs.
3. Conducting formal and informal consultations to take into account the views of all stakeholders.
4. Obtaining political guarantees for a vision or strategy.
5. Approval of the vision.

2.4. Analysis and assessment of the current situation

The baseline for the development of the Basin Plan is a comprehensive analysis and assessment of the current situation. Analysis /assessment can be carried out both by the stakeholders themselves and with the involvement of additional experts and should include:

- Assessment of the current status of water resources management to identify management problems and possible solutions.
- Analysis of all key sectors causing problems and requiring improvement.
- Forming a list of problems and recommendations for their solution.
- Determination of priority issues on a given time interval.

The analysis/assessment of the situation should be based on the balance between technical data, subjective information

obtained by experts, and available statistical data. The collection of information should be most complete and focused on identifying the maximum number of problems.

In carrying out the analysis directly or indirectly, i.e. through interviews or requests for certain data, all interested parties should be involved. This approach allows us to identify all the existing problems at various levels and in various areas.

In carrying out the analysis/assessment, an important aspect is the widespread use of modern innovative information and communication technologies. Such innovative technologies include the following:

1) Internet online database.
2) GIS (geographic information systems).
3) Remote sensing.
4) Use of GPS system.

The results of the analysis/assessment should be disseminated as widely as possible in order to receive additional comments and suggestions from interested parties. The forms of dissemination of information can be different, for example, the organization of intersectoral dialogues involving all stakeholders.

Certainly, as a result of such a comprehensive analysis, a significant number of problems and issues requiring solutions can be identified. All identified problems are compiled in a special list called the register of problems.

Problems and issues within the framework of basin planning recorded in the register can be linked:

- with the provision of water and food production;
- with the provision of public health;
- with the reduction of the negative impact on the environment;
- with the increase of management efficiency;
- with the development of monitoring;
- with research or technical re-equipment, etc.

The register is compiled on the basis of the procedure for identifying, assessing and updating all the problems of the basin. All identified problems should be recorded in the register. The register does not contain a list of actions to solve problems, but it also contains a list of measurable indicators for against the problem can be monitored.

The register of problems is developed as a basis for ranking and prioritization. The received priority problems are the basis for setting goals and objectives of the basin plan and compiling a list of activities.

The register of problems should be accessible to stakeholders and the general public, who also have the right to offer suggestions for expanding or reducing the list of problems.

It must be remembered that only the solution of the root problem can lead to an improvement in the situation in the basin. In this regard, when formulating the register of problems, in each case it is necessary to determine the main problem, from which all the others stem.

Table 4

Example of a basin problem register

Identified problem	Negative consequences and risks	Reasons	Element(s) of activity	Indicator	Ranking
Lack of irrigation water	• loss of irrigation water • decrease in land productivity	• long service life of irrigation systems • deterioration of irrigation systems	agriculture (irrigated agriculture)	• efficiency of irrigation systems • loss of water from the moment of sampling to field feeding	
Pollution of water objects by collector-drainage, sewage and household waste from settlements along river beds	• decrease in water quality in water bodies • increased risk of infectious diseases	• lack of ongoing maintenance of systems • absence of CDS purification systems • non-observance of water protection zones and bands • low public awareness on water issues	municipal economy	• quantity of waste water discharged into rivers • indicators of water quality in rivers • number of unauthorized dumps	
Shallowing of delta lakes	• bogging • loss of fish stocks • decrease in productivity of lake pastures	• water abstraction for irrigation	agriculture (irrigated agriculture)	• territory of lakes, • number of fish stocks • species composition of fish • pasture area	

Explanations to the REGISTER columns:

1. **Identified problem** is a negative change both in the natural environment and in the economic and social plans. All problems are broken down into blocks and should be clearly defined and formulated.
2. **Negative consequences and risks** are a list of adverse events that may occur due to the presence of this problem.
3. **Reasons** are a list of factors that lead to the emergence of this environmental problem.
4. **Element (s) of activity** - a list of spheres (directions, etc.) of human activity that interact with the environment and lead to the emergence of this problem.
5. **Indicator** - a system of indicators, which should monitor the state of this environmental problem (it decreased or vice versa - increased).
6. **Ranking** is a digital indicator that was assigned to this problem after the ranking was done.

To identify root problems, a special tool called the «problem tree» can be used to detect causal relationships.

Below is an example of the «problem tree». A sufficiently detailed «problem tree» allows identifying the root problem and reflecting it in the register of problems.

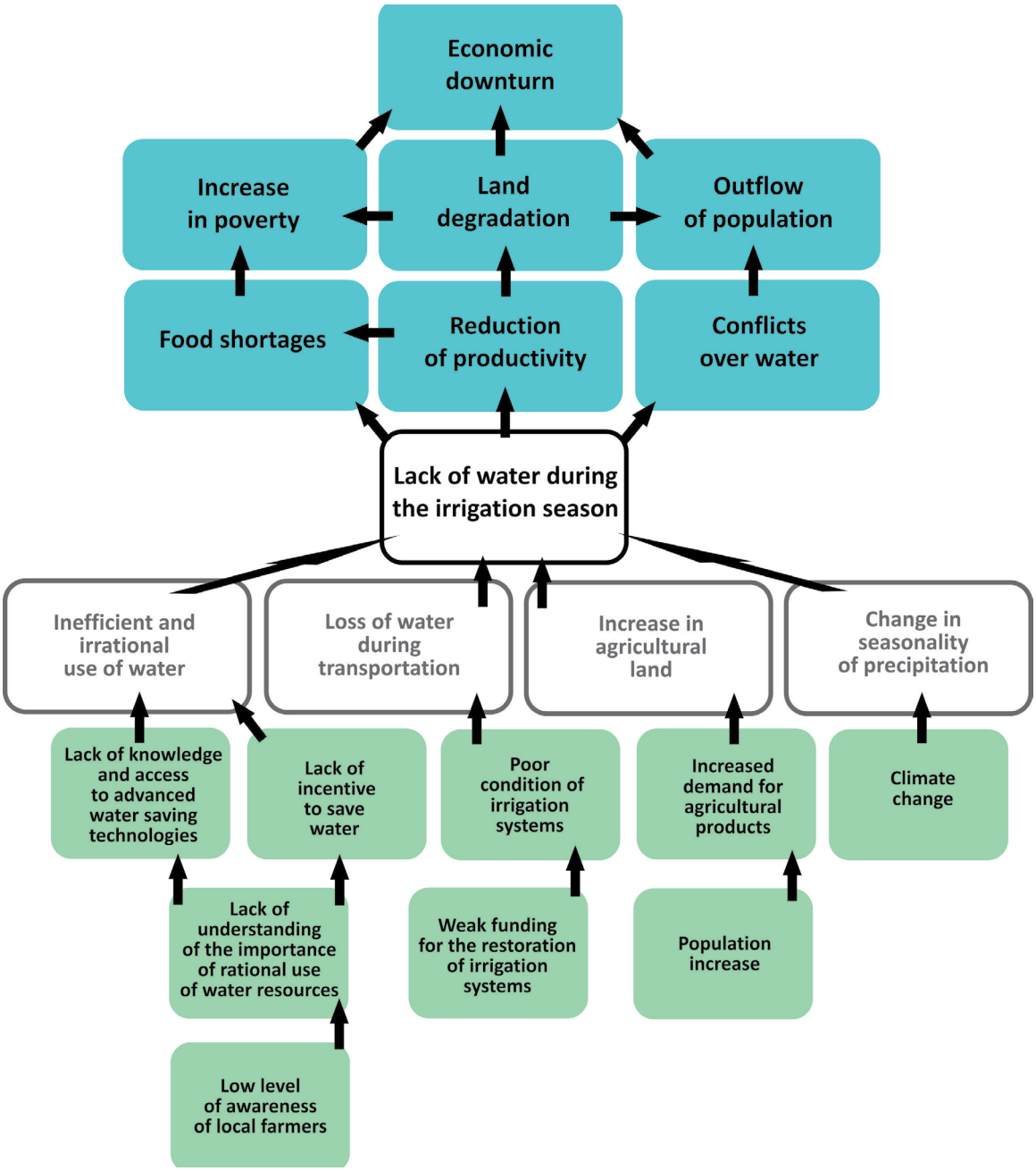


Figure 7. "Problem Tree"

As mentioned above, each problem listed in the register must go through a ranking procedure taking into account the environmental impact, economic and social development of the basin, possible negative consequences and risks. All information is entered in the appropriate columns of the registry, and then the resulting ranking is displayed. The evaluation results are recorded in the problem assessment matrix (see table 5).

The assessment of problems can be carried out on the basis of the criteria listed below, however in each basin the evaluation criteria may vary depending on the specifics of the basin. The number of criteria can also vary depending on the decision of the parties concerned.

Table 5

Matrix of problem assessment

Name of environmental problem	Scale of impact (1-5)	Complexity / cost of exposure change (1-5)	Timeframe (1-5)	Public interest (1-5)	Priority rating of the problem (total)
Lack of irrigation water	4	5	3	5	17
Pollution of water bodies by collector-drainage, sewage and household waste from settlements along river beds	3	4	4	5	16
Shallowing of delta lakes	4	2	4	1	11

Those problems that receive the highest scores are priority and form the basis of the basin plan. Based on these issues goals and objectives and activities will be developed.

However, prioritizing problems does not imply that all other problems should not be taken into consideration. The review of the register and prioritization of problems should be carried out on a regular basis. The deadline for the revision of the register is set by the parties concerned.

Problems, and their solution which is not yet included in the plan at this stage, may enter into it in the future when reviewing the registry. Thus, all problems will be included in the plan and will be resolved at certain time.

Possible criteria for evaluating problems:

Scale of impact. The scale of the impact is estimated on a five-point scale. The maximum value (5) is assigned to problems of global significance (for example, climate change or the disappearance of species listed in the IUCN Red Data Book). The value «4» is assigned to impacts that affect significant areas or different types of ecosystems (for example, impacts on transboundary waters). The value of «3» is an average effect, having a pronounced territorial character, covering considerable areas. The value of «2» is assigned to local impacts, which can be gradually spread over a long period of time. The minimum value of «1» is assigned to impacts that are of a local nature, and do not involve further spreading through water or air, and which do not affect unique habitats of flora and fauna.

Complexity / cost of change in exposure. This criterion assesses the technical, financial or organizational complexity of changing the negative situation that characterizes a particular problem. The maximum values are assigned to those problems whose solution is technically and financially feasible (from 3 to 5). Difficult changes will have a lower value (1-2).

Time frame. This criterion estimates the necessary amount of time to change the negative situation that characterizes a particular problem. The maximum values are assigned to those problems, the solution of which requires less time (from 3 to 5). Changes that require a long period will have a lower value (1-2).

Interest from the public. The minimum value of «1» is assigned to a problem characterized by a lack of interest on the part of the public. If there is little interest at the local level and there are a limited number of stakeholders, the value «2» is assigned. If there is interest from the general public at the basin level, the problem is assigned the value «3» or «4». If the problem attracts public attention at the national and (or) international level, the problem is characterized by the highest rating of «5».

All values according to the evaluation criteria are summarized in the column «Priority ranking of the problem». High values of the «Priority ranking of the problem» indicate the high importance of the problem, the possibility and the need for its urgent solution.

Techniques that are used to rank problems can be different. In this handbook, only one of the methods for ranking problems is given. At the same time, ranking can be done by various stakeholders, for example, separately by the public, by state structures, by scientists and experts, then all ranking results are collected, and the average indicator is derived from them. Ranking can be done during a meeting or remotely. This approach allows you to exclude subjectivity.

2.5. Definition of goals and objectives

Goals and objectives of the basin plan are being developed to solve identified priority problems. Clearly formulated goals and objectives are the key to effective implementation of the plan in the future. The objectives for the implementation of basin plans should be in line with IWRM principles and have a number of characteristic features such as:

- **Interrelation with water policy** and international obligations.
- **Specificity** (the goal is set to solve the problem identified).
- **Measurability** (the ability to evaluate with the help of certain indicators achieved the goal or not).
- **Achievability** (as a result of certain actions, in this time period and with available resources, it is possible to achieve the set goal).
- **Efficiency** (achievement of the goal allows solving certain problems of the basin).
- **Definition in time** (defined over what period of time you can achieve the goal).
- **Interrelation of goals** (the goal is interrelated with other objectives of the development of the basin).

When formulating goals and objectives, it is necessary to clearly understand the difference between one and the other. There are a number of differences between goals and objectives, both in terms of management and performance levels:

- **Level of management** - goals are set at the state/basin level, and tasks at the local level.
- **Quality-Quantity** - goals are quality indicators. As a rule, tasks have specific quantitative indicators.
- **Hypothesis-Guarantee** - the objectives may be hypothetical, not achievable in the present time period. Tasks are guaranteed to be achievable, their implementation can be measured.
- **Assessment-Monitoring-Achieving** goals is defined in the framework of the final evaluation. The degree of achievement of the tasks set is determined by regular monitoring and, if necessary by adjusting the actions.
- **Policy - Program - Objectives** are determined at the level of political decision making/strategic planning/ strategic vision. The tasks are set at the level of regional, regional, local programs, development plans.

The elaborated «problem tree» at the stage of situation analysis is a good basis for developing goals and objectives. The solution of the identified central problem can serve as the main objective of the plan. Decisions of the problems of the second level can serve as tasks, and deriving from the third level problems it is possible to identify necessary measures for inclusion into the plan. Thus, the developed «problem tree» can be turned into the «objective and tasks tree».

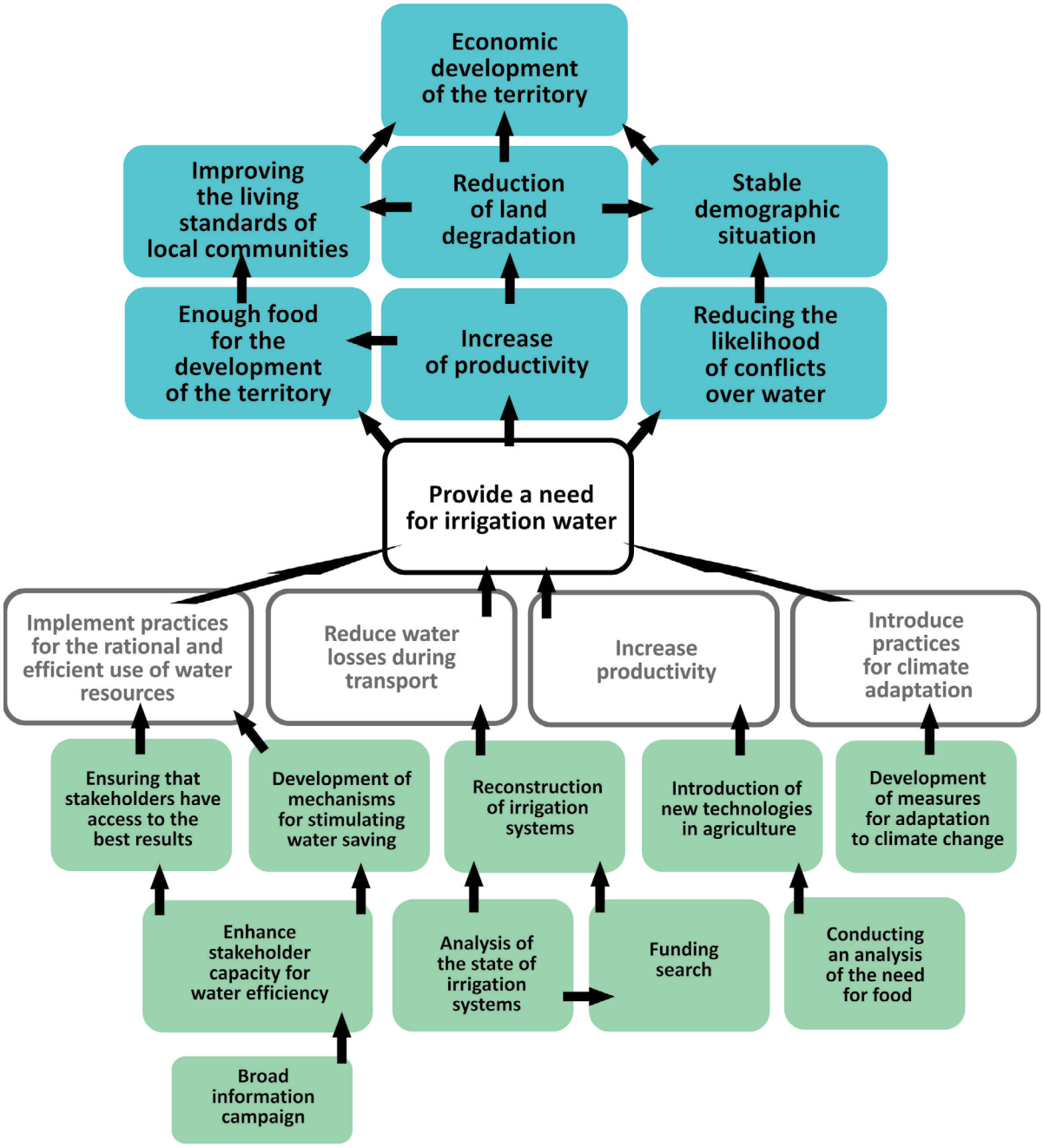


Figure 8. Tree of Goals and Objectives

From the example of the «tree of goals and objectives», the following goals and objectives for the plan can be formulated:

Purpose: To satisfy the population's need for irrigation water.

Tasks:

- To introduce the practice of rational and efficient use of water resources;
- To reduce water loss during transportation by 20%;
- To increase productivity through the use of advanced technologies in agriculture.

2.6. Development and approval of the text of the basin plan

After carrying out preparatory work, it is necessary to put all received materials into one document - the basin plan.

In developing the text of the plan, a number of basic principles must be observed:

- Public participation in the development, discussion and approval of the plan.
- Analysis of the current water management situation in the basin.
- Identification of the main water management and other activities to be implemented to meet the long-term water needs of the population and sectors of the economy, as well as to protect water and prevent harmful effects.
- Identification of specific goals and objectives, a system of indicators /performance indicators, as well as mechanisms for monitoring the implementation of the plan.
- Identification of clear priorities.
- Distribution of roles for the implementation of the activities of the Plan and for monitoring its implementation, drawing up a financing plan and setting timeframes.
- Focus on key constraints in water management.
- Review of the entire hydrological cycle/of all river basins.

Development of the text of the basin plan can be carried out in different ways: it is entrusted to one person, a team of experts, representatives of interested ministries and departments, or external consultants. The choice of the approach to developing the text depends on the decision of the stakeholders and the availability of financial resources for the development of the plan.

It should be noted that the persons who will be involved in preparing the text of the plan should participate at all stages of the planning process, from the situation analysis to the development of the plan's activities.

The first step for the development is the content of the plan. The decision on the contents of the plan should be made by all interested parties.

It is necessary that the plan reflects the state water strategy, programs and plans for strategic development of the overall state and the basin.

The contents of the plan may differ by country /basin depending on the priorities selected. However, there are several mandatory parts of the plan, such as:

- Analysis and assessment of the situation.
- Goals and objectives.
- Activities of the plan.
- Expected results from its implementation.

At the same time, the internal content of each chapter can be different and depends on the characteristics of the basin and on the decision made by the parties concerned.

It is of great importance in the development of the content of the plan to ensure the participation of politicians and the public; therefore it is important to develop a feedback mechanism with key stakeholders. The **feedback mechanism** is developed on a case-by-case basis, taking into account the specifics of the basin and the representation of stakeholders, and may include consultations, general discussions, the collection of comments and suggestions via the Internet, etc.

This approach makes it easier to agree on in the future. If the process of participation/ involvement has been well organized, then approval should not be problematic. The active participation of stakeholders at all stages allows for approval to be a mere formality, since all interests have already been taken into account

at the planning stage.

The final version of the basin plan should be widely disseminated and accessible to all stakeholders. As a rule, basin plans are placed on the web-sites of Basin Organizations.

Also important is the possibility of constant updating of the plan and its revision on a regular basis. The basin plan is a «living» document, constantly changing in accordance with the conditions. In this regard, **the plan necessarily prescribes a mechanism for revising the plan and making adjustments.**

2.7. The role of the Basin Organizations in the discussion, adoption and implementation of basin plans

Since development and implementation of basin plan is based on the principle of involving the maximum number of stakeholders, there is a need in a common platform/advisory body that allows undertaking joint actions. The creation of the site is an indispensable condition for the implementation of IWRM principles, basin planning and further implementation of basin plans.

As described in the first chapter of this manual, there are various types of basin organizations that can serve as similar sites. The creation of pilot sites is possible on the territory of a basin of any level - both at the country, or transboundary level, and at the local level on the scale of one small river.

These may be basin councils, joint commissions, initiative groups, advisory groups and any other groups that include various stakeholders and are aimed at improving water management in the river basin.

Each member of such an advisory body at the planning stage of the plan may participate in the process as follows:

- Protect consumer and environmental interests in the basin.
- Promote the introduction of changes to improve legislative and regulatory acts.
- Form a register of problems and carry out the selection of priority goals and objectives.
- To monitor and evaluate the development of the basin plan, thereby ensuring the effectiveness of the development of the plan and reducing the risk of negative consequences.
- To disseminate information about the stages of the plan development. Form the public opinion about the actions being taken.
- Lobby the interests of its sector during the formation of the priorities of the plan, etc.

At the same time, each member of the process can participate in the implementation of the plan. Participation can be diverse - starting from the overall coordination of the implementation of the plan and ending with the implementation of individual activities.

2.8. Monitoring and evaluation of implementation of IWRM plans

The efficiency and effectiveness of the basin plan depends on the correctness of the implemented activities. In order to track the implementation of the plan, it is vital to monitor and evaluate the implementation of all measures and their impact on the basin as a whole.

The effectiveness of the implementation of the plan can be monitored at various stages - from the implementation of individual plan activities to the evaluation of the efficiency and effectiveness of the plan itself.

It is important that the mechanism for

monitoring and evaluating the implementation of the plan be laid down at the stage of its development and agreed with all stakeholders. The following points regarding monitoring and evaluation should be clearly stated in the plan:

- Measured targets (indicators) for the implementation of individual activities and the plan as a whole are defined.
- Sources, methods of collection and information transmission channels have been established.
- Technologies of information processing are defined.
- **The costs of monitoring and evaluation are taken into account in the budget of the plan.**

As stated above, an important element of the plan monitoring mechanism is the development of performance indicators for the implementation of the plan. Indicators are developed at the stage of determining the expected results from the implementation of the plan. In aggregate, developed indicators should answer the main question: «Based on which criteria do we undestand that the results of the program were achieved?».

Indicator development is carried out directly by the developers of the plan itself, however the indicators should also be discussed with all interested parties. Indicators can be both quantitative and qualitative. **Indicators are determined at the development stage, but can be adjusted during the implementation of the plan.**

In developing the assessment and monitoring mechanism, one of the most important tasks is to identify those individuals/entities that will be responsible for assessing and monitoring the implementation of the plan. However, functions can be divided between different stakeholders, for example:

Water department - as an agency that implements the general policy, it can evaluate the plan for compliance with development strategies.

Management at the basin level - as the main responsible agency for the implementation of the plan - it can provide continuous monitoring of the plan's implementation and the evaluation of effectiveness.

Basin Council/Stakeholder Committees - as a body representing all stakeholders and participating in the development of the plan - it can provide continuous monitoring of the plan's implementation and the evaluation of effectiveness.

Non-governmental organizations - monitoring the implementation of certain activities of the plan. For example, a water meter-equipment, cleaning canals or installation of pipes for drinking water supply.

Independent experts - monitoring the implementation of individual activities of the plan. For example, restoration work.

CHAPTER 3. ADAPTATION TO CLIMATE CHANGE AS PART OF BASIN PLANNING

Due to the changing climate, Central Asia is experiencing serious difficulties, some are particularly palpable. The average annual temperature throughout the territory of Central Asia has increased by about 10 ° C. This affected hydrology - resulted in accelerated melting of glaciers and a decrease in snow cover in winter. According to forecasts, by 2050 the volume of the Amudarya and Syrdarya River Basins (the main rivers of Central Asia) will decrease by 10-15% and 2-5% respectively (CAREC, 2011). According to experts, about 70% of the likely damage from weather and climate disasters will occur in the agricultural production sector.

To adequately address the problem of adaptation to climate change, strategic planning should become an integral part of planning at the national, regional and local levels and accordingly, part of basin planning. In this regard, when developing basin plans, adaptation issues should become one of the most fundamentally observed.

In the «Second National Reports of Central Asian Countries» compiled by national scientific and expert councils in 2006-2009 under the auspices of the United Nations Framework Convention on Climate Change, a number of problems common to the region and related to climate change have been identified, which should be taken into account in the development of basin plans:

1. Increase in the deficit of existing water resources and deterioration of their quality, including:

- accelerated melting of glaciers and reduction of snow cover;
- change in the hydrological regime of surface waters, runoff in the basins of the Amudarya and Syrdarya Rivers in the years of drought may decrease by 25-40%;
- demand for water in Uzbekistan is already growing faster and is inconsistent with its available resources;
- variability of runoff in all basins is expected to increase, as well as an increase in mudflow;
- expected increase in water consumption to meet the vital needs of the growing population and economic activities will exert increasing pressure on water resources, and the problems of water scarcity in arid and semi-arid regions of Uzbekistan will become increasingly critical;
- intensification of siltation and drying up of lakes and rivers;
- acceleration of desertification, land degradation and salinization;
- decrease in access of the

population to quality drinking water.

The negative consequences for agriculture due to lack of water for irrigation, salinization of agricultural lands, and droughts and dry winds lead to lower crop yields, and changes in species composition of pastures, lower productivity of livestock and an increase in livestock mortality.

In general, the impact of climate change on irrigation will have the following consequences:

- With climate change, the high natural aridity in the Central Asian region is maintained, which will lead to an increase in the requirements for water in irrigated agriculture.

- With the present situation in irrigated agriculture, and also with the growing demand for water in other sectors of the economy, climate change will inevitably lead to an increase in the water deficit in agriculture.

- The expected increase in evaporation under warming conditions will increase water losses in the irrigation zones, which will require additional water use. An increase in the temperature will result in an increase in irrigation rates by 5 per cent by 2030, by 7-10 per cent by 2050 and by 12-16 per cent by 2080.

- An increase in the intensity of groundwater discharge in the aeration zone is expected, which will lead to an increase in secondary salinization, further land degradation and a decrease in crop productivity.

- Additional loss of crop yields due to increased weather extremes (atmospheric drought, heavy rainfall, hail, high temperatures).

2. Increase in negative consequences for the energy sector by increasing tensions between neighboring countries in the coordination and regulation of irrigation and energy regimes, which could pose a threat to the energy security of countries. The increase in the number of natural phenomena increases the degree of impact on hydraulic structures and affects the level of their safety.

3. The increase in the risk of hazardous and extreme hydrometeorological events, namely the increase in the number and frequency of extreme weather events, such as hail, hurricanes, rainfall, drought, extreme high or low temperatures and, as a consequence:

- increase in the number and intensity of freshets, floods;
- increased water erosion and flushing of fertile soil;
- an increase in the frequency of catastrophic mudflows;
- acceleration of landslide processes and formation of ravines.

4. Increased risk of diseases and stresses associated with climate change, such as infectious diseases, diseases of the circulatory system, of the cardiovascular system, malignant neoplasms; risks of heat and cold stress; gastrointestinal diseases.

5. Increased risk to existing ecosystems and threats to biodiversity, including shifting of climatic zones and habitat changes of flora and fauna, changes in land use and land cover. As adaptation measures to address the identified problems in the basin plans, activities aimed at improving the technologies used and repairing /building the infrastructure can be introduced. Such measures may include restoration of existing and introduction of more effective irrigation systems (sprinklers, drip irrigation), construction of regulated dams (mainly in Turkmenistan), etc.

Among the preventive measures, the strengthening of the scientific and information base can be noted:

- organization of systematic observation and environmental monitoring networks;
- increase the reliability of hydrological forecasts;
- creation of observation points over the snow cover and glaciers

in the mountainous areas of the upper reaches of the Aral Sea basin;
- introduction of a scientific approach to the development of the agricultural sector (for example, selection of sustainable and yielding crops, development of new environmental practices);
- strengthening of organizational, technical and human potential, for example, training farmers on alternative farming practices.

Measures to reduce the risk of hazardous and extreme hydrometeorological events can also be included in the basin plans. Such activities include issues related to the modernization of observing systems and meteorological services, the improvement of the early warning system and the strengthening of emergency response services, the cessation of deforestation of mountain forests and overgrazing, and the strengthening of eroded slopes.

The inclusion of the above issues in the basin plans can reduce the risks of negative consequences of climate change.

A number of tools are also being developed to analyze such effects and to identify the best measures to mitigate them.

One such tool is the «Climate proofing for Development»[8] mechanism, which allows for the inclusion of optimal measures for adaptation to climate change in planning processes.

Climate proofing for development - Integration of climate change issues into planning processes

On behalf of the German Federal Ministry for Economic Cooperation and Development, GIZ developed an approach called «Climateproofing for Development». This is a methodological approach aimed at integrating climate change issues into development planning at different levels - national, sectoral, local and project level.

«Climate proofing for Development» offers ways to identify options for action and prioritization when planning adaptation to climate change and when reviewing existing priorities. When properly applied, this approach helps to make plans or investments more «climate-proof».

This approach is most effective when strategies or policies are only being formulated, and municipal plans and projects are not yet implemented. Nevertheless, such an analysis can be carried out in the process of review or even implementation of plans.

The «Climate proofing for Development» approach can be used by all stakeholders.

8 https://www.adaptationcommunity.net/?wpfb_dl=34

CHAPTER 4. POSSIBILITIES TO CREATE ECONOMIC SUSTAINABILITY OF DEVELOPMENT AND IMPLEMENTATION ON BASIN PLANS

4.1. Necessary costs in the development and implementation of basin plans

The development of the basin plan – is a long and work intensive process that requires certain costs. However, taking into account the flexible approach to the development and implementation of the plans, as well as the local specifics in each case, the financial costs and the applicable financing mechanisms will be different.

The costs of developing and implementing basin plans can be divided into three main blocks:

1. Development of the basin plan.
2. Implementation of the basin plan.
3. Monitoring the implementation of the basin plan.

As can be seen from the scheme above, each block includes several types of costs that are necessary to achieve the goals set at each stage. It should be noted that not all of the above costs are mandatory.

At the **stage of development** of the basin plan, financial costs can be minimized. For example, expert assessments can be performed by members of the Basin Organization, and do not require additional costs. The necessary data can be provided by various structures located in the basin and interested in sustainable development of the territory.

The text of the plan can be written by an initiative group of members of the Basin Organization, as well as by volunteers. Thus, at the stage of the plan development, financial costs can be limited only by holding joint meetings, which can also be done with minimal costs.

The **implementation stage** is the most costly; however, even here measures can be identified that do not require large financial investments. So, for example, measures for landscaping of rural areas, garbage collection, clearing of springs, etc. can be performed by local residents.

This stage also allows attracting investments on the basis of state programs or corporate social responsibility of business. It is possible to attract donor funds for the implementation of certain activities of the plan. Various mechanisms for attracting financial resources are given below in this chapter.

The **monitoring and evaluation stage**, as well as the development stage, can be implemented without significant costs by the members of the basin organizations or the public. It is also

possible to monitor the state of activities that are carried out by certain other agencies.

Thus, the lack of financial resources is not a barrier to the development and implementation of the basin plan, but it reduces the opportunities for rapid implementation of certain actions.

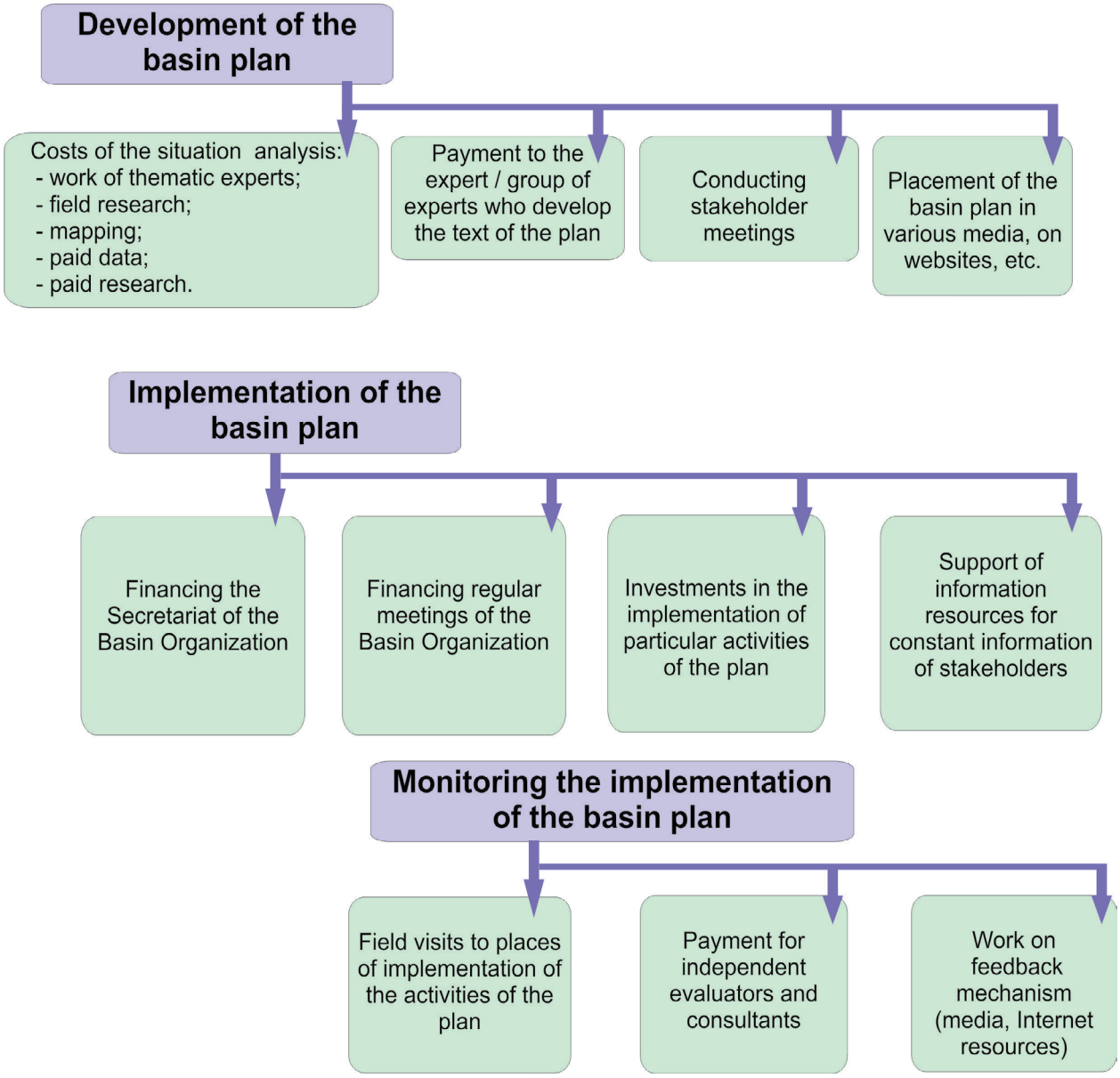


Figure 9. Possible costs in the development and implementation of basin plans

4.2. Possible sources of financing for the implementation of basin plans

Currently, there are a number of financing mechanisms that allow activities within the framework of the basin plans. Financial mechanisms can be divided into three large blocks - the state and local budget, incentive mechanisms and alternative financing mechanisms.

At present, the first block, the state and local budgets, which are formed based on taxes, tariffs, fines, fees for the use of natural resources and pollution charges, is the most developed. The mechanism of functioning of this block is clearly worked out and applied in all countries of Central Asia. State programs of

various levels are financed from the budget, from republican wide to local programs.

It should be noted that through the state programs all three stages of the basin planning described above can be financed.

Much attention is currently being paid to stimulating mechanisms for the development of territories and the introduction of best practices. Such mechanisms include subsidies and loans.

Despite the fact that these mechanisms in Central Asia are not yet sufficiently developed, there are examples of their application. For example, in Kyrgyzstan there are subsidies for the payment of electricity for the operation of pumps supplying water for irrigation. In Kazakhstan there is a program of subsidizing local budgets to increase the yield and quality of crop production through the use of advanced technologies, including drip irrigation.

Subsidized tariffs for water supply and wastewater discharge, paid for by privileged categories of the population (veterans, invalids, etc.) can also be referred to as subsidies. Such subsidized tariffs exist in all countries of Central Asia.

Stimulanting mechanisms are most applicable at the stage of implementation of the basin plans.

Alternative financing mechanisms can be divided into two large blocks.

The first block includes mechanisms related to the organization of **voluntary fund-raising** for various purposes and at different levels. Such mechanisms include the most advanced methods of creating specialized funds, as well as the mechanism for payments for ecosystem services. Several examples of this block will be considered in detail in the next section.

The second block includes two main mechanisms: attraction of donor assistance in the form of grants and competitions and development of public-private partnerships.

Within the framework of donor assistance, funds are allocated every year for the implementation of various projects, including those related to the introduction of new technologies in the water sector, water supply, and agriculture. Much attention is paid to issues of adaptation to climate change and emergency situations. Priority issues reflected in the basin plans can serve as a good basis for including them in donor programs. Implementation of various activities of the plan for donor funds is possible through governmental and non-governmental organizations, as well as other members of Basin Organizations.

Public-private partnership for the countries of Central Asia is a new mechanism, which is used very narrowly and is usually aimed at solving social issues, such as the construction of roads, schools, hospitals, etc. However, it should be noted that the involvement of large enterprises in the planning process, as one of the stakeholders, makes it possible to use this mechanism to implement activities of the basin plans.

Despite the novelty of alternative financing mechanisms, their application is possible in all countries of Central Asia. In the legislation of the countries of the region, the development and implementation of state, interstate and regional water use and protection programs can be implemented both at the expense of state and local budgets, and at the expense of legal entities, extra-budgetary funds, voluntary contributions of organizations and citizens.

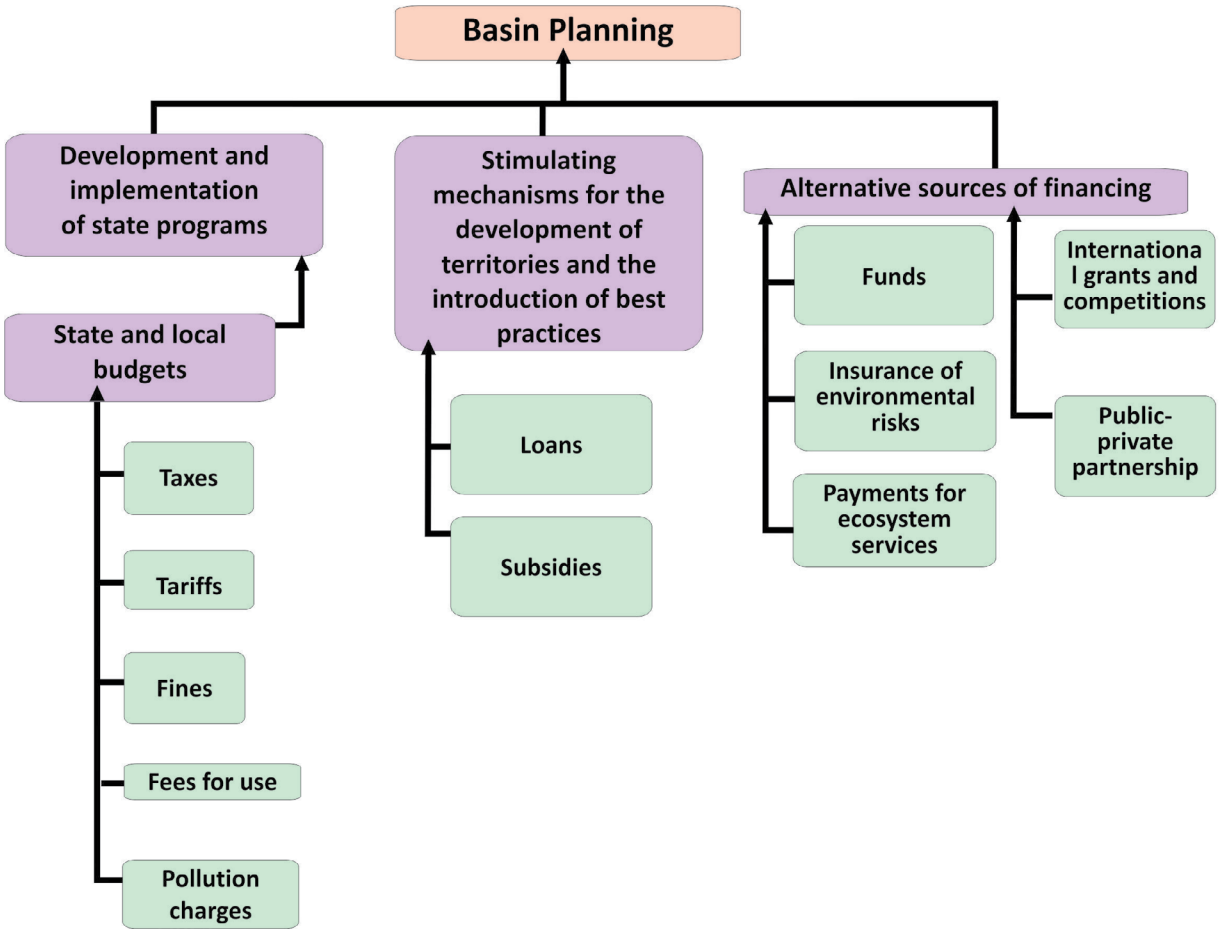


Figure 10. Possibilities for financing the development and implementation of Basin Plans.

4.3. Alternative means and methods of attracting financial resources for the implementation of basin plans

Often, the creation of effective water management systems in the basins require large investments. Such measures include the reconstruction and construction of irrigation systems, the introduction of water-saving and energy-efficient technologies, the optimization of management systems and the provision of access to drinking and irrigation water. Such measures are possible only if there are large financial resources. In connection with this, the whole world is developing such a special mechanism in the form of the **Funds**. Forms of formation, purpose, and also the level of such funds can be different. Funds can be created at the level of one settlement, the river basin or at the state level. Some examples of such funds are given in this handbook.

The **revolving fund** is one of the effective financial mechanisms in conditions of a shortage of funds from local and regional administrations. The idea of such a fund is to accumulate financial resources to invest in expensive projects with a long payback period. Constant reinvestment in projects with a short payback period accumulates new resources at the expense of cash flows entering the fund. Revolving funds, as a rule, are formed by accumulating a part of payments for water delivery, for electricity, etc.

The revolving fund can be created as a settlement account of the local administration. Thus, the city administration will be the owner of the projects and at the same time the owner of the revolving fund. It is very important that the work of the revolving fund be transparent to all participants in the accumulation process. This approach allows providing a trusting attitude to the Fund.

In basin planning, the accumulated facilities of the fund can be invested into the solution of the main priority issues in agreement with the basin organization.

The second kind of funds is the specialized **thematic fund** - extrabudgetary state funds, created for solving urgent thematic tasks. Such funds include environmental funds, whose tasks include the restoration of the natural environment, compensation for harm caused, etc. Land reclamation funds can also be created for the purpose of ameliorative improvement of irrigated lands, construction and reconstruction of collector-drainage systems, strengthening of material and technical base, etc.

Specialized thematic Funds can be formed by funds received from legal entities and individuals (including fees for emissions, discharges of pollutants into the environment, disposal of wastes and other types of pollution); the amounts received on claims for compensation for harm and fines for environmental offenses; funds from the sale of confiscated hunting and fishing tools, illegally obtained products with their help, etc.

The main task of such funds is the accumulation of budgetary and extra-budgetary funds on the fund's account. The fund develops long-term and medium-term state programs with the stakeholders to improve the state of the environment.

Such funds may form the basis for funding the basin plan. Activities of plans can be financed individually from the fund, in blocks or in the form of specialized sub-programs. Long-term and capital-intensive projects can also be financed by such environmental funds.

One of the advanced mechanisms of alternative financing is payments for ecosystem services. The Regional Environmental Center of Central Asia implements a number of projects aimed at implementing this mechanism. In Central Asia, the first examples of the introduction of **Payments for Ecosystem Services** (PES) appeared in 2009. The first PES contract in Central Asia was signed on December 5, 2011 in the Chon-Aksuv River Basin, Kyrgyzstan. At present, testing of the implementation of this mechanism in Kazakhstan, Tajikistan and Uzbekistan is underway.

Land Reclamation Fund of the Republic of Uzbekistan

In the Republic of Uzbekistan, special attention is paid to reclamation improvement of irrigated lands. In 2007, the Fund for the Ameliorative Improvement of Irrigated Lands was established and two State Programs for the ameliorative improvement of irrigated lands and the technical condition of water bodies for 2008-2012 and 2013-2017 were adopted. Within the framework of these programs, one of the most important priorities in the development of agriculture is the cardinal improvement of the reclamation state of irrigated lands through strict separation of functions and increasing the responsibility of customers and implementers of land reclamation, providing a reliable financing mechanism, strengthening the material and technical base, renewing the fleet of reclamation equipment of water management organizations and water user associations, etc.

The program realizations performed over 10 years, allowed to improve the reclamation state of 2040000 hectares of irrigated land, to reduce the area of heavily and medium-saline lands by 81000 hectares, and also to reduce the level of groundwater on 365000 hectares. For the implementation of these programs, the state budget allocated about 1.7 billion USD.

Ecosystem services (EC) are the benefits that a person derives from the dynamic interaction of functioning ecosystems between plant, animal, microorganism, and inanimate communities.

Payments for ecosystem services (PES) are schemes through which community groups benefiting from environmental improvements directly offset the costs of those working on these improvements[9].

At the same time, the types of payments under PES schemes can be different: cash, in kind, services, bonuses, certificates, etc. PES projects can be implemented in three main cooperation schemes: public, public- private, and completely private. Due to the PES mechanism, those activities of basin plans can be implemented, within which it is possible to identify the «seller» and «buyer» of ecosystem services.

Due to the PES mechanism, those activities of basin Plans can be implemented, within which it is possible to identify the «seller» and «buyer» of ecosystem services.

In addition, foreign investments, in particular soft loans from international financial institutions (IFIs), for example loans from the World Bank, the Asian Development Bank, the Islamic Development Bank, the European Bank for Development and Reconstruction, etc. can also be used to implement basin plans. It should be noted that over the past 10 years in Uzbekistan in the field of water management, due to concessional loans from IFIs, various foreign and international investment funds and development agencies, more than 20 major investment projects worth over $ 2.5 billion were implemented.

As this chapter of the manual shows, funding for the development and implementation of basin plans is possible by a variety of sources. The combination of all mechanisms and methods of financing allow guaranteeing the implementation of the basin plans. However, in case of basin planning at the stage of development of measures, it is necessary to think in advance which of the proposed financial mechanisms will be applicable for certain activities.

Example of PES in Central Asia
Implementation of the PES scheme in the Chon-Aksuv River Basin, Kyrgyzstan

The basin of the Chon-Aksuv River is located to the north of the Issyk-Kul Lake. It includes a mountainous area covered with pastures and forests, where livestock is kept and agricultural land, which is closer to the lake, where cereal grains, fodder plants and fruits grow.

Farmers located downstream often encounter a water shortage in the irrigation period and a high level of suspended sediment in the river due to excessive grazing of the livestock, which eventually leads to clogging of the water supply pipes.

Ecosystem service: Stable supply of water of higher quality

The content of the agreement and the parties concerned:

Terms of the agreement: The first PES agreement dated December 5, 2011 was concluded for a period of one year with the subsequent possibility of extension, provided that the ecosystem services were actually presented in the required capacity.

9 Definition of OECD (2012)

Buyers:

1. **The Water User Association** (water users for irrigation) pays:

- Leskhoz: 10 person / days a year to assist in the planting of trees and shrubs, construction of fences, etc.;
- Pasture Committee: 20 people / days a year to improve pasture quality

2. **The Association of Mushroom Pickers** (users of forest services) pays the Leskhoz in the form of 30 people / days a year for soil preparation, planting trees, etc.

3. **Tourists** (users of recreational services) pay cash to the Leskhoz at the entrance to the ravine 20 soums per person and 50 soums per the vehicle.

Sellers:

4. **Leskhoz** undertakes to:

- Allocate 10% of collected fees for entering the ravine to be sent to plant trees in this ravine;
- Fence fresh plantings;
- Fence the most strategic forest areas for natural forest regeneration;
- Cooperate with pasture committees and village administrations.

5. **Pasture committees** undertake to:
- Develop a pasture management plan;
- Follow recommendations for maximum pasture load, repair infrastructure for the sake of providing access to remote pastures, temporarily fence some pasture areas for self-recovery;
- Limit and control grazing in forest areas.

Intermediary organizations and monitoring:

An intersectoral group of 12 people monitors the fulfillment of obligations under the PES contract. The evaluation results are submitted for review and evaluation to the Project Coordinating Committee, consisting of 20 members, representatives of all major interested sectors.

Financial mechanism

Form of payment: all payment is in kind.

Existing results:

1. On May 7, 2012, 4 hectares of trees - 13,000 seedlings - were planted by 32 representatives of ushroom pickers and 3 water users. It is expected that these plantations will contribute to the improvement of the forest ecosystem in the upper part of the watershed, and will prevent possible erosion on these lands.
2. Several «micro-reserves» were created by the Leskhoz in the forest area and at the border between forest and pastures. The purpose of these fenced areas is to demonstrate to the pasture owners the negative impact of livestock: which results in soil degradation, erosion, and the impossibility of natural restoration of vegetation.
3. On September 5, 2012, the first visit of the Monitoring and Evaluation of PES compliance was held.
4. On September 6, 2012, the Coordination Committee decided to continue the contracts for the next year.

CHAPTER 5: STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

5.1. General introduction

The Strategic Environmental Assessment is a systematic and comprehensive process which contributes to informed decision making related to both environmental protection and sustainable development. It is usually applied to plans and programmes which are likely to have significant effects on the environment. The immediate aim of strategic assessment is to enable **sound decision making** and to provide a way of **problem resolution**, primarily with regard to **environmental, social and health effects** of a decision. However, SEA is also directed toward achieving or supporting the ultimate goals of **environmental protection and sustainable development.**

SEA began to be employed in several countries by the mid-1980s, by 2001 the EU introduced Directive 2001/42/EC[10], which specifically deals with SEA and is binding in all Member States. The **SEA Protocol[11] to the UNECE Convention on Environmental Impact Assessment in a Transboundary Context**[12] was adopted at a meeting of the Parties to the Espoo Convention on 21 May 2003 and entered into force on 10 July 2010. The SEA Protocol can be considered the most complete and comprehensive international legal document on this topic. SEA is strongly linked both to the United Nations Millennium Development Goals (Goal No. 7) as well as to the Rio Declaration on Environment and Development (Principle 4).

5.2. Definition and difference to EIA

According to a definition by the OECD SEA *"consists of a range of analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the inter-linkages with economic and social considerations."* This definition contains the main elements to characterize SEA and to clarify the differences to the Environmental Impact Assessment (EIA). In broad lines both – SEA and EIA - follow the same instruments (e.g. related to participation, transparency, etc.) but there some key differences.

10 Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment
11 Uzbekistan is not a Party to the Convention.
12 Uzbekistan has neither signed nor ratified the Protocol.

Table 6

Main differences between SEA and EIA

SEA	EIA
Instrument which is applied to policies, plans and programmes at an early stage of decision-making processes	Instrument which is applied to projects at the end of decision-making processes
Addresses sustainable development issues	Addresses specific effects on the environment
Emphasis on prevention and environmental objectives	Emphasis on mitigation and reduction of environmental impacts

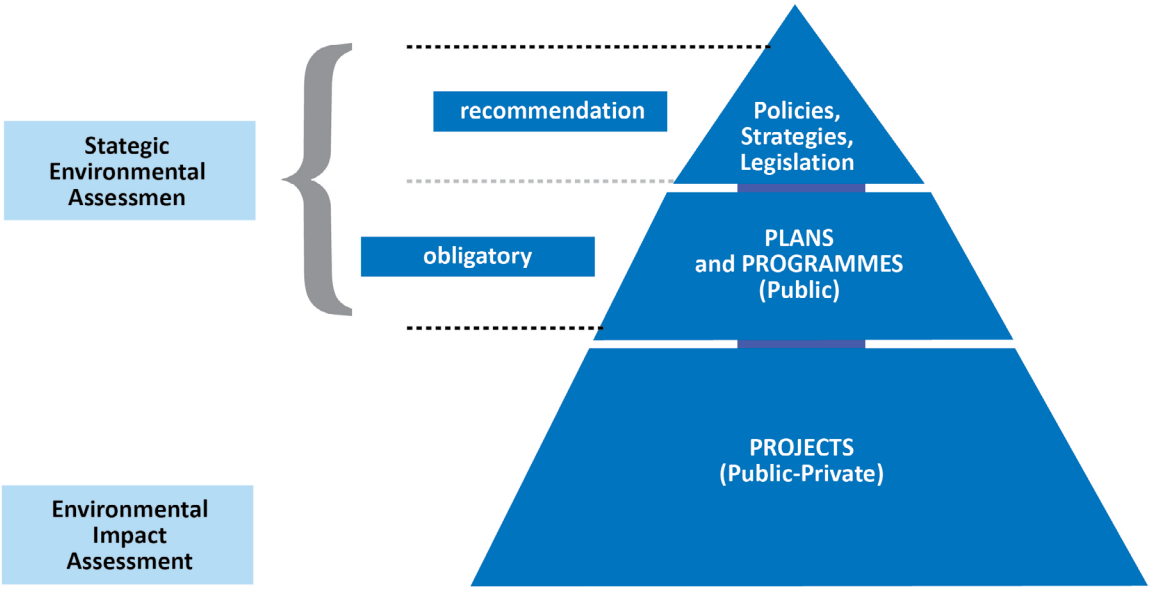


Figure 11. This difference can also be presented in the form of a diagram
Source: UNECE: Protocol on Strategic Environmental Assessment: Facts and Benefits (May 2016)

5.3. Objectives and principles

The United Nations Environment Programme (UNEP)[13] explains SEA as a systematic and comprehensive process which contributes to informed decision making related to both environmental protection and sustainable development by:

- Providing environmental foresight
- Considering the effects of proposed strategic actions (policy, programme and plan)
- Identifying the best practicable environmental option
- Providing early warning of cumulative effects and large-scale changes
- Contributing to integrated policy making and planning

The major objective of SEA is thus the integration of environmental considerations into strategic decision making and the support of environmentally sound and sustainable development. Important elements of this process are the assessment of alternatives and transparency and participation in the national and the trans-boundary context.

SEA assists authorities to take into account key environmental objectives, indicators and trends, allows for evaluating the significant environmental effects of implementing a plan or programme and to assess necessary measures to avoid, reduce or mitigate adverse effects. Furthermore SEA assists to address the following key questions:

- What are the key linkages of a plan/ programme to the environment and social issues?
- What are the key risks and opportunities?
- What are the implications for global environmental issues such as greenhouse gas emissions or biodiversity? What are the related social and economic effects likely to result from the plan/programme?
- What are the broader and cumulative effects that may affect the context for the plan/ programme?
- Have potential trans-boundary effects been identified? If yes, has notification/information exchange taken place prior to major strategic decisions?

5.4. Procedure overview

SEA is usually applied to plans and programmes which are likely to have significant effects on the environment. An **environmental effect is any effect on the environment**, including effects on human health, flora, fauna, biodiversity, soil, climate, air, water, landscape, natural sites, material assets, cultural heritage and the interaction among these factors. In order to be able to properly assess and evaluate both effects and necessary measures a typical SEA comprises the following steps/elements, which are carried out consecutively:

Step 1: Screening
Step 2: Scoping
Step 3: Environmental Report
Step 4: Decision-making
Step 5: Monitoring

The elements and tools relevant for RBMP are contained in the respective steps and will be described below.

13 M.Ling, L.Coppens, M. MacDevette, A. Mapendembe: An Introduction to Environmental Assessment, UNEP 2015

5.5. General benefits of applying SEA

As of today, Uzbekistan is neither party to the Espoo Convention nor to the SEA Protocol, nevertheless it can employ SEA or elements of SEA in its strategic planning decision-making processes. Areas where strategic assessment regularly should take place include urban development and land-use planning, river basin management and water use planning and other medium- to long-term plans, policies and strategies. SEA experience provides for **a set of well-developed and tested methodologies and respective tools which allow for effective and efficient planning and decision-making.**

General benefits of the application of SEA or elements of SEA in Uzbekistan include the following:

- Improvement of the information base for policy making, planning and programme development.
- Strengthening the plan and programme making processes and output quality.
- Better environmental protection and promotion sustainable development (integration of environmental considerations).
- Supports climate change adaptation (climate change issues considered in planning).
- Minimization of risks for investments – save time and money by avoiding costly mistakes (early warning about unsustainable development options, reduction of remediation costs).
- Improvement of good governance and building public trust and confidence in decision-making - avoid conflicting interests.
- Facilitation of environmental diplomacy and promotion of regional stability (trans-boundary consultations).
- Achieving a high level of environmental protection and wellbeing of individuals and communities.

5.6. Integrated Water Resource management (IWRM) and SEA

Integrated Water Resources Management promotes the **coordinated development and management of water, land and related resources** in order to **maximize economic and social welfare** in an equitable manner without compromising the sustainability of vital ecosystems and the environment. Integrated Water Resources Management is based on the understanding that water resources are an integral component of the ecosystem, a natural resource, and a social and economic good[14].

The Strategic Environmental Assessment (SEA) offers a complementary tool to Integrated Water Resources Management to introduce and integrate environmental considerations into River Basin Planning. SEA can support the implementation of Integrated Water Resources Management as they share many concepts and characteristics.[15]

Both SEA and IWRM

- are integrating environmental considerations;
- take decisions on multi-sectoral levels;
- support participation and consultation for decision-making;
- support monitoring and evaluation of outcomes;
- broaden the perspectives beyond sectoral issues;
- are process oriented;
- aim to improve the management of natural resources.

14 Global Water Partnership: https://www.sswm.info/concept/iwrm/integrated-water-resources-management-(iwrm)
15 SEA – Strategic Environmental Assessment. World Bank (2009). Strategic Environmental Assessment-Improving Water Resources Governance and Decision Making: Case Studies, Paper No. 116., Washington, DC, USA

Table 7

IWRM main stages and SEA elements

IWRM – main stages	SEA elements
1. Analysis of stakeholder, Initialization of plan development	• Screening • Scoping • Environmental Report • Final Decision
2. Strategic Vision, Stages of vision development	• Scoping • Environmental Report
3. Analysis and assessment of the current situation	• Scoping • Environmental Report
4. Definition of goals and objectives	• Scoping • Environmental Report
5. Development and approval of the text of the basin plan	• Environmental Report
6. The role of Basin Organizations in the discussion, adoption and implementation of basin plans	• Environmental Report • Decision making
7. Monitoring and evaluation of implementation of IWRM plans	• Monitoring

5.7. Basin Planning Cycle and SEA Elements

The seven main stages of the current planning cycle for IWRM[16] can easily be complemented with elements of SEA.

Stage 1 - **Analyses of stakeholders, plan** Initialization: Stakeholder involvement as well as participation of various key players and the public takes place during several steps of SEA. The intensity and extent of this involvement varies. During the screening procedure (1. step of SEA) authorities with relevant environmental responsibility are consulted with regard to the determination, if a plan/programme is likely to have significant environmental effects. Environmental and health authorities are consulted durings scoping (2. step of SEA) when determining the content of the environmental report. The public is consulted on the Environmental Report (3. step of SEA) and on the draft of the plan/programme. Finally, neighboring countries are consulted when transboundary impacts are likely to occur. Information about the Final Decision is, as a last step, provided to environmental authorities and to the public by a summarizing statement.

Stage 2 – Development of a strategic vison: The strategic vision`s long-term goal of development of the river basin, including sustainable development approaches and IWRM principles, is comparable to the main objectives of SEA – namely environmentally sound and sustainable development.

Stage 3 – Analysis and assessment of the current situation: Based on information on the main existing problems and the main goals of the basin plan, scoping helps to identify the environmental issues to be further addressed. It determines possible significant effects of the plan and the possible reasons for significant impacts. Complementary to the basin plan, which identifies the current status and problems with regard to water, the Environmental Report provides information on

16 See Basin Planning Handbook, Chapter 2

all environmental issues significantly affected by the basin plan. This may include related topics such as human health, flora and fauna, biodiversity, soil, climate and air, landscape, natural sites, material assets, cultural heritage and the interaction among these factors.

Stage 4 – Definition of goals and objectives: In order to help to solve the identified problems, objectives of basin plans are developed. These might find their basis in international obligations but derive mainly from water policy and should be in line with IWRM principles.[17] SEA integrates environmental issues other than water and different objectives and goals can be formulated for these environmental issues during scoping or drafting of the Environmental Report. An example of an objective for the field of biodiversity is to "reduce the direct pressures on biodiversity and promote sustainable use". With the help of specific indicators the achievement of goals can be evaluated.

Stage 5 - **Development and approval of the basin plan**: The basic principles to be observed when **developing a basin plan**[18] are also valid for SEA. See below the basic principles of basin planning and their corresponding practice in SEA.

Stage 6 – Adoption and implementation of the sasin plan: For implementing and participating in the process of basin planning within the IWRM the installation of a common platform is needed.[19] In the practice of **SEA processes** interactive websites with the opportunity to present the plan and the Environmental Report are often used to facilitate participation of stakeholders and the public. **Decision** makers take account of the conclusions of the Environmental Report and comments from the consultation processes. Information on how environmental considerations have been integrated and the comments received have been taken into account is provided to the public by means of a **summarizing statement**.

Stage 7 – Monitoring and evaluation: Significant environmental effects of the implementation of a basin plan need to be monitored. **Monitoring** allows for a comparison of the results of the environmental assessment and of the effects of the basin plan and identifies unforeseen adverse effects at an early stage. Existing monitoring arrangements may be used to avoid a duplication of work. The results of monitoring should be made available for the public.

The main aim of the scoping exercise is the determination of the content of the Environmental Report including the

17 See Basin Planning Handbook, Chapter 2.5
18 See Basin Planning Handbook, Chapter 2.6
19 See Basin Planning Handbook, Chapter 2.7

Table 8

Basic principles of basin planning and their corresponding practice in SEA

Basic principles of basin planning	SEA element
Public participation in the development, discussion and approval of the plan.	The public has the opportunity to express their opinion on the draft plan and the Environmental Report. Public gets informed about the decision.
Analysis of the current situation in the basin.	Scoping identifies the Environmental issues to be addressed. The Environmental Report provides information on the current state of the relevant environmental issues like human health, flora, fauna, biodiversity, soil, climate, air, water, landscape, natural sites, material assets, cultural heritage and the interaction among these factors.
Identification of the main water management and other activities to be implemented to meet the long-term water needs of the population and sectors of the economy, as well as to protect water and prevent their harmful effects.	The Environmental Report provides an assessment of likely significant effects on all relevant environmental areas and documents measures envisaged to prevent, reduce and offset these significant adverse effects of implementing the plan.
Identification of specific goals and objectives, a system of indicators/performance indicators, as well as mechanisms for monitoring the implementation of the plan.	The Environmental Report identifies specific goals and objectives for the relevant environmental issues. Environmental indicators show the achievement of the goals and objectives and can be used for monitoring the effects of the plan. The Environmental Report identifies mechanisms for monitoring the implementation of the plan.
Identify clear priorities.	During scoping and drafting of the Environmental Report relevant environmental issues are prioritised.
Distribution of roles for the implementation of the activities of the plan and for monitoring its implementation, drawing up a financing plan and setting timeframes.	The Environmental Report provides information on the interactive process and integration of SEA in the planning cycle as well as the timeframe for monitoring. Conclusions from the Environmental Report and comments from consulting are taken into account and are presented in the Summarizing Statement (information on how environmental considerations have been integrated and the comments received have been taken into account).
Focus on key constraints in water management.	The scoping process and the Environmental Report focus on likely significant effects on all relevant environmental issues.
Review of the entire hydrological cycle/of all river basins.	Review of SEA elements

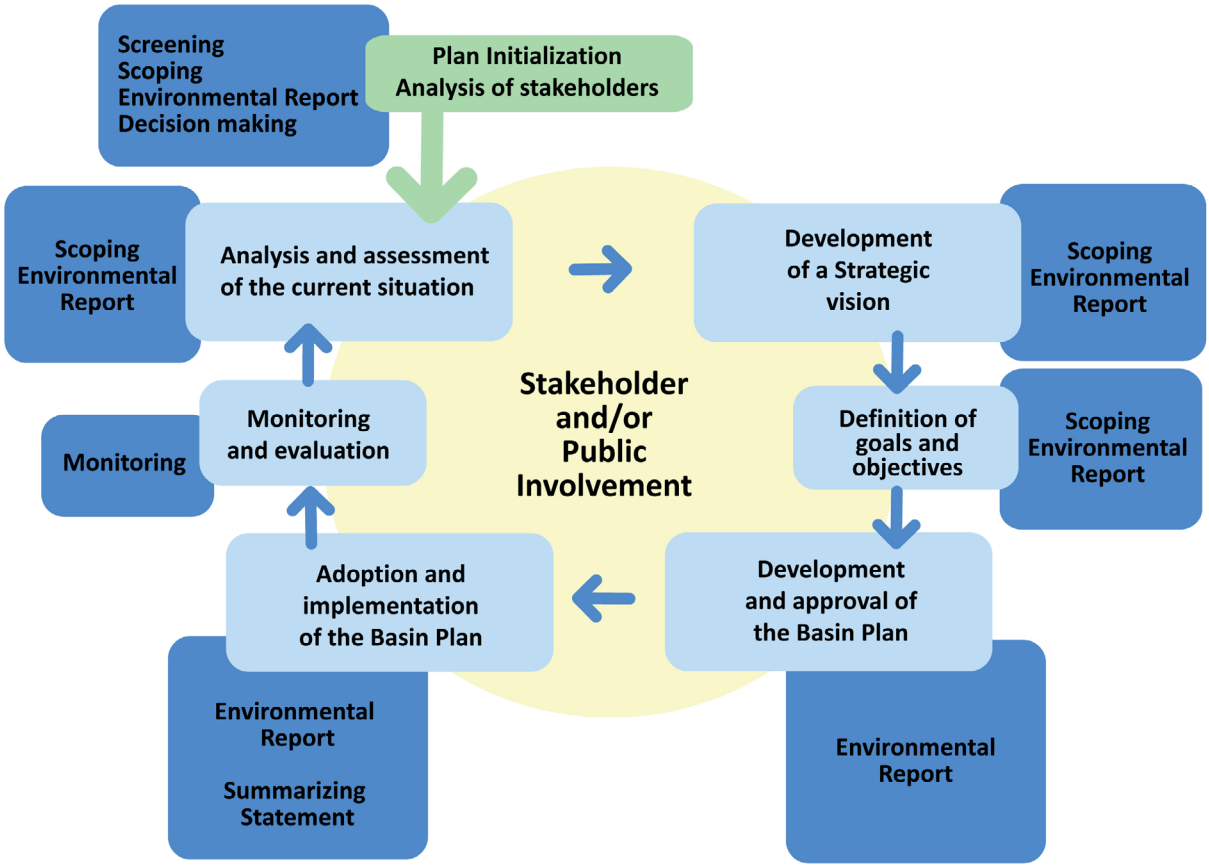


Figure 12 Basin Planning Cycle and SEA Elements

5.8. International examples on SEA (good practice/related to RBMP)

Example 1: Scoping - National Water Management Plan Austria 2009

territorial scope, the planed timeline and the environmental issues to be further addressed. The selection of these relevant environmental issues for SEA of the **National Water Management Plan Austria 2009** was mainly carried out by experts in the fields of ground and surface water, nature conservation, landscapes, soil, air and climate as well as experts from the Ministry of Environment who were competent for preparing the plan. By means of the Scoping process the principle information with regard to the content of the basin plan was defined and the main impacts on the environment could be assessed.

Methodical steps:

1. Possible causes of environmental impacts

Using a checklist the experts had to decide if the basin plan will lead to the listed causes of environmental impacts.

Main content of the environmental report:

- Relevant aspects of the current

Table 9

Example Checklist Causes of Environmental Impacts

Causes of environmental impacts	to consider	not to consider
Soil consumption	☒	
Formation of landscape		☒
Water exploitation, use, water sampling		☒
Use of ressources		☒
Change of terrain		☒
Change of hydrology		☒
Forest clearance	☒	
Traffic	☒	
Visual changes		☒
Landslide, mudflow, avalanche, flooding		☒
Risk of emergencies		☒
Noise emissions	☒	
Air pollution		☒
Water Emissions		☒
Waste		☒
Accumulation effects		☒
Synergetics		☒

These environmental impacts may affect the following environmental issues:

Table 10

Causes of Environmetal Impacts

Assessment of Enviromental Impacts of the National Water Management Plan		Land Consumption	Formation of Landscape	Water explotation, use, water sampling	Use of resources (e.g. energy)	Change of terrain	Forest deerance	Traffic	Visual changes	Landslide, mudflow, avalanche, flooding	Risk of emergencies	Noise emissions	Air pollution	Liquid emissions	Waste	Accumulation and Synergies
Impact on Environmental Issues	Soil															
	Water: ground and surface water															
	Air															
	Climate															
	Fauna															
	Flora															
	Biodiversity															
	Health															
	Landscape															
	Material Assets															
	Cultural Heritage															
	Accumulation and Synergies															

3. Environmental Issues to be further addressed in the Environmental Report

By combining the possible impacts and the matrix a list of relevant environmental issues to be considered could be elaborated.

Table 11

Example 2: Environmental Report - National Water Management Plan Austria 2015

Environmental issues	to consider	not to consider
Soil		☐
Water: Ground and Surface Water		☐
Air		☐
Climate		☐
Flora, Fauna, Biodiversity, Landscape		☐
Health		☐
Material Assets		☐
Cultural Heritage	☐	
Accumulation and Synergies		☐

state of the environment and the likely evolution thereof without implementation of NGP – for all relevant environmental aspects such as biodiversity, human health, fauna, flora, soil, water, air, climatic factors, landscape.

- Likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.
- Measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment.
- Outline of the reasons for selecting the alternatives dealt with.
- Measures envisaged with regard to monitoring.

The most important aspect of the environmental report is the assessment of the likely significant effects on the environment.

Procedure of the assessment – National Water Management Plan Austria 2015:

The procedure of assessment was based on already identified implementation measures (activities) in the National Water Management Plan 2015. These intended measures were assessed hereafter.

Public participation concerning Austria´s National River Basin Management Plan started with a kick-off information day in

1. Definition of environmental objectives for each relevant environmental aspect

Example for soil – "protection of sustainable fertility of agricultural soil"
Example for water – "good quality and quantity of groundwater"
Example for climatic factors – "prevention of impacts from global warming"

2. Selection of proper Indicators

Example for soil – "pollution of soil – exceed target value"
Example for groundwater – "quality and quantity of groundwater"
Example for climatic factors – "contribution to climate change adaptation"

3. Assessment of likely significant effects

Example of the measure "protection of water-sampling regions":
The measure includes, amongst others, the following actions:
dedication of spring water and groundwater resources for water supply;
use restrictions regarding areas for water supply;
package of measures against relevant pollution.

Table 12

Example: Assessment of the measure „protection of water-sampling regions"

Environmental aspect	Environmental objective	Indicator	No implementation of NGP 2015 = current state	Implementation of NGP 2015
SOIL	protection of sustainable fertility of agricultural soil	pollution of soil – exceed target value	0	+
WATER	good quality and quantity of groundwater	quality and quantity of groundwater	0	+
CLIMATIC FACTORS	prevention of impacts from global warming	contribution to climate change adaptation	0	+

Scale:

Negative impact -
No impact 0
Positive impact +

These actions will reduce pollution and better ensure groundwater resources for water supply as well as contribute to climate change adaptation.

Example 3: Public Participation - National Water Management Plan Austria 2015

January 2015. The main content of the Draft National River Basin Management Plan was presented by experts from the Ministry of Environment, questions from the audience were answered and a panel discussion took place. From January 2015 to July 2015 the draft of the River Basin Management Plan and the Environmental Report were published online. About 80 Statements from the public, various stakeholders and NGO´s (which were also published online) were considered in a revised version before the River Basin Management Plan entered into force. See (German): https://www.bmnt.gv.at/wasser/wisa/fachinformation/ngp/ngp-2015/oeffbet_ngp2015.html.

CONCLUSION

In conclusion, it should be noted that the proposed methodology is universal, and can be applied in different states, at different levels and under different basic conditions.

Despite the generality of the approach used, the plans for each basin will differ from each other. Even within one state there will not be two identical basin plans. However, when developing and implementing basin plans, the following basic principles should be applied:

- The basis for the basin plan is a comprehensive analysis of the current situation and the compilation of a register of all existing problems.
- The identified problems should be ranked by priority. The most pressing problems at this moment are the basis of the plan.
- The activities of the plan are aimed at solving the main priority problems, which nevertheless, impliy also constant monitoring of other, less priority issues to date, not included in this plan. When developing the next plan, priorities can be changed and supplemented - thus including the results of monitoring the situation and implementing the previous plan.
- The basin plan is not a static document and should be constantly reviewed and refined if necessary, the development of new Plans should become a regular and widely applicable practice.
- The most important principle of basin planning is the involvement of all stakeholders at all stages of the development, implementation and monitoring of the implementation of basin plans. The opinion of all interested parties should be taken into account and a compromise will be reached on any disputable issues.
- A basin organization, formal or informal, is the key to the sustainability of the established basin planning mechanism.
- One of the important aspects in the process of basin planning is the availability of funding. In this regard, it is necessary to use all available funding mechanisms and their combinations to implement the activities of the plan.
- As environmental objectives have become more central to basin planning, the extent and sophistication of environmental objectives and plans within the basin planning process has increased. Strategic environment assessment (SEA) offers a complementary tool to Integrated Water Resources

Management to introduce and integrate environmental considerations into River Basin Planning. SEA can support the implementation of Integrated Water Resources Management as they share many concepts and characteristics.

Each of the above principles is mandatory in the development and implementation of basin plans. Compliance with these principles allows the development of actual, feasible and effective basin plans.

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Sources of additional information on the topics. Can be found at: website of the GIZ programme http://www.waterca.org/

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