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EU4Environment in Eastern Partner Countries:

Water Resources and Environmental Data (ENI/2021/425-550)

OPPORTUNITIES AND PREREQUISITES FOR REFORMING WATER ABSTRACTION FEES AND WATER POLLUTION TAXES IN ARMENIA

FINAL REPORT

July 2024

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Table of contents

List of Tables

List of Figures

LIST OF ACRONYMS

AMD	Armenian Dram
BMO	Basin Management Organisation
CEPA	Comprehensive and Enhanced Partnership Agreement
EAP	Eastern Partnership
EC	European Commission
ENI	European Neighbourhood Instrument
EPMIB	Environmental Protection and Mining Inspection Body
EU	European Union
HMC	Hydrometeorology and Monitoring Centre
IMF	International Monetary Fund
OECD	Organisation for Economic Co-operation and Development
RBD	River Basin District
RBMP	River Basin Management Plan
UNECE	United Nations Economic Commission for Europe
USAID	United States Agency for International Development
MAC	Maximum Allowable Concentration
WFD	Water Framework Directive
WRMD	Water Resources Management Department
WUA	Water Users Association

EXECUTIVE SUMMARY

The economic instruments in the water sector of Armenia are being applied for over two decades. With the adoption of the Water Code (2002), National Water Policy (2005) and the National Water Program (2006) the use of economic instruments was expanded, as more emphasis was put on application of the "polluter pays" and "user pays" principles.

The key economic instruments applied in water management of Armenia are the water abstraction fees and water pollution taxes. They have two main functions: regulatory function - to reduce the negative environmental impact and ensure the sustainable use of water resources, and fiscal function – to generate financial resources for protection, management and monitoring of water resources and possibly increase the monetary flow for investments in the water sector.

The rates for **water abstraction fees** and procedures for calculation of the fees are regulated by the Tax Code of the Republic of Armenia (Articles 214, 215), and they vary according to water sources and sectors. There are several deficiencies in the current system of the water abstraction fees, and despite the requirements of the Water Code, National Water Policy and National Water Program, the "user pays" principles is applied only partially, and not in a fair manner and based on the equity principle. Particularly:

- a special lower rate applies for the water supply companies and local self-governments in case of self-supplied communities, which is 20 times less than the rate for the other user for drinking-communal purposes;
- the fee for fisheries is applied only to certain percentage (varying between 5% to 50%, according to location and to the type of the water resource) of the total volume abstraction, this creating unjustified privilege compared to other water use sector;
- the largest consumptive water use sector - irrigation, is not charged, if water is abstracted from surface bodies (except for Lake Sevan), and in case of abstraction from Lake Sevan the charges for irrigation are significantly lower, compared to other sectors;
- hydropower, which is the largest water abstraction sector in Armenia, until now does not pay any water abstraction fee;
- there are contradictions between different clauses (Articles 201, 203) of the Tax Code on the basis for calculation of the water abstraction fee (permitted quantity vs actual water use).

The rates for **water pollution taxes** and procedures for calculation of the taxes are regulated by the Tax Code of the Republic of Armenia (Article 169), which defines charges per ton for discharging pollutants and their compounds into the water basins. According paragraph 2 of the Article 169 of the Tax Code, for discharge of pollutants into Lake Sevan Basin, as well as Hrazdan and Getar Rivers in the territory of Hrazdan canyon the rates mentioned in the table above are doubled (except for the water supply companies).

There are ambiguities in terms of the objectives of the current system of the water pollution taxes, and it's not clear whether they aim to prevent the pollution of water bodies due to discharge of pollutants, compensate the damage caused due to pollution, reduce the damage or something else. In addition to this, there are several other major issues with the current system of water pollution taxes in Armenia, including the following:

- for certain parameters (when the WUP condition does not indicate any allowed marginal discharges) maximum allowable concentration (MACs) for fisheries are being used, while Armenia has eliminated that system of old Soviet MACs in its water quality assessment system back in 2011, given the several evident drawbacks of such system;
- the rationale behind doubling the rates for discharge of pollutants into Lake Sevan Basin, as well as Hrazdan and Getar Rivers in the territory of Hrazdan canyon is not clear, given that there are over 40 other rivers in the country, where water quality is assessed at "being at risk";
- the current system of water pollution taxes also violates the "polluter pays" and the equity principle, given that one of the most important pressure factors on water quality – the water supply and sanitation companies, are given special privileges;
- the current system contradicts with the logic of the Water Code of Armenia, which clearly states that one of the basis for defining the water pollution taxes is the ecological status of water body, which receives the wastewater. Also, according to the Water Code, the type of wastewater and the level of their impact on water resources should be taken into consideration while defining the water pollution taxes, which is not the case now;
- the list of pollutants was developed over two decades ago and there is a need to revise the list, to incorporate the significant pressure sources on water quality, taking into consideration the River Basin Management Plans (RBMPs).

As a result of the above-mentioned deficiencies in the system of water abstraction fees and water pollution taxes, the total financial revenues are very low as compared to the full costs of activities that would be required to achieve the water management objectives defined in the Armenian law. This results from low levels of unitary fees that do not provide an incentive for efficient water use and do not internalize the full environmental and resource costs. In addition, the unfair distribution of charges among users' groups, reveal a poor application of the "user pays" and "polluter pays" principles, despite the fact that this principle is one of the pillars of the current water-related Armenian legislation (also in line with the EU WFD). Thus, reforming economic instruments for water management in Armenia to make them more robust is prerogative.

Thus, this study aims to take the reform on economic instruments in water management in Armenia one step further, by supporting development of a road map that paves the way to the reform of the structure and level of water abstraction fees and water pollution taxes in Armenia. The reforms are proposed in the context of short-, medium- and long-term objectives (likely in 10 years or more in the context of the next significant review of water policy in Armenia), as summarized in the table below:

The proposed short-, medium- and long-term objectives of reforming water abstraction fees and water pollution taxes in Armenia

	Water abstraction fees	Water pollution taxes
Short-term objective	Revenues from water abstraction fees must be sufficient to cover all expenses involved in proper management of water resources, water policy implementation, water resources monitoring, and compliance assurance with water use permit conditions	Revenues from water pollution taxes should take into account the costs associated to implementation of the measure from the RBMPs aimed at improving the qualitative status of water bodies at risk due to water quality
Medium- and long-term objective	Fee rates should take into account the resource costs of water abstraction, as well as provide an incentive for a more efficient use of water resources (reduced water abstraction)	Fee rates should take into account of the environmental costs of pollution, as well as provide an incentive for reduced polluting discharges in coherence with the need to protect aquatic ecosystems and their related uses

To achieve the above-mentioned short term objectives, the study proposes to reform the rates of water abstraction fees for certain sectors, but in a way that the impact of the sectors and the population is minimal or negligible, as summarized in the table below:

Proposed reforms in the rates of water abstraction fees

Sector	Proposed revision	Expected annual additional revenue	Expected impact
Fisheries	Application of the abstraction fee on 100% of the volume of total abstraction	484 mln AMD	Currently the fee in Ararat and Armavir marzes represent less than 1.9% of revenues of fish farms, so after the reform it would still be below 4%
Drinking	Elimination of the special lower tariff for water supply companies and setting it at the rate of 0.5 AMD/m^3 (as for the other abstractions for drinking-communal purposes)	204 mln AMD	There will be no significant impact on the cost structure of the water supply companies and eventually on the tariff for the households. Even after the increase of water abstraction fee for drinking-communal needs up to the rate of 0.5 AMD/m^3, it would constitute only about 0.29% of the tariff for the drinking water supply services, which currently composes 170.4 AMD/m^3
Irrigation	Revision of the fee 0 AMD/m^3 (for abstraction of surface water and	156 mln AMD	The average cost of the 1 m^3 of water supplied by WUAs is 22.9 AMD/m^3, and the proposed fee would constitute about 0.4% additional expenses in the cost

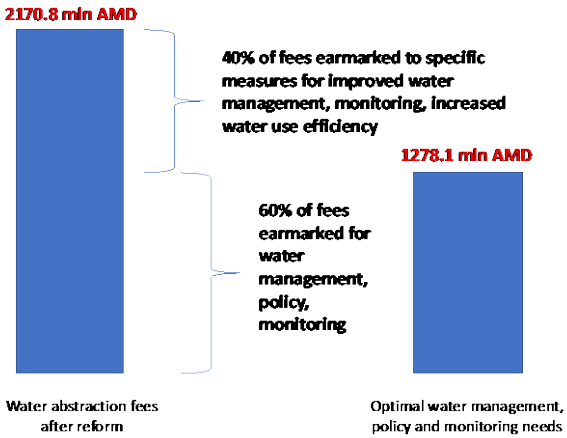
Sector	Proposed revision	Expected annual additional revenue	Expected impact
	groundwater not suitable for drinking) and definition of the fee at the rate of 0.1 AMD/m^3		structure of WUAs, while making an important shift in mentality and strengthening the application of the principle “user pays”

Given that since January 2024 the hydropower sector (abstracting annually about 6.76 billion m3 water) will also be paying water abstraction fee at the rate of 0.1 AMD/m^3, the above-mentioned reforms could generate 2170.8 mln AMD (compared to current 650.8 mln AMD) from the water abstraction fees annually without any significant negative impact.

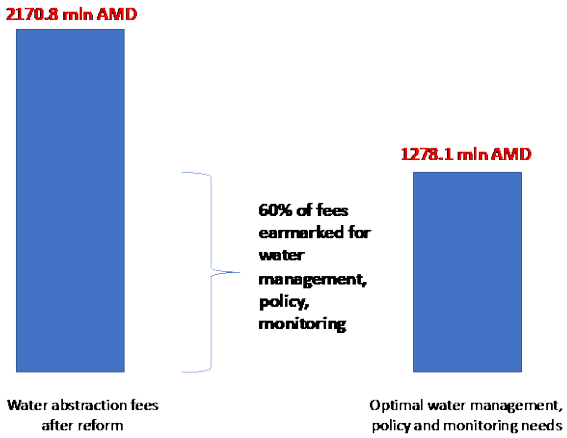
While currently the state budget allocation to water policy, water resources management and protection, water resources monitoring and compliance assurance composes 780 mln AMD (or 20% more compared to the revenues generated from the water abstraction fees), these functions have largely remained underfunded, and in reality the financing needs are significantly higher, also taking into consideration the obligations undertaken by Armenia under the CEPA. Thus, the “optimal” water policy, water resources management, monitoring and compliance assurance needs, which is very rough assessment of the real needs, based on the consultations with the beneficiaries, previously existing reports and assessments, are assessed at the level of annual level of 1278.1 mln AMD (compared to the current 780.8 mln AMD).

The above-mentioned figures demonstrate that with the proposed reforms of the system of water abstraction fees, which should not have significant socio-economic impact on the water use sectors, as well as farmers and household, it would be possible to cover the optimal needs for water policy, water resources management, monitoring and compliance assurance, and moreover still over 40% of the expected revenues from the water abstraction fees would remain.

This amount could be used potentially used for implementation of selected measures from the Program of Measures of the RBMPs (Scenario 1), aimed at strengthening of water resources monitoring, compliance assurance, legal and institutional improvement, providing as subsidies for implementation of specific technical measures to improve water use efficiency, or other needs, contributing to improvement of overall water resources management, or go to the state budget (Scenario 2).



Proposed Scenario 1



Proposed Scenario 2

As for the water pollution taxes, after defining the short-term objective, there is a need to complete revise and basically revitalize the system, taking into consideration the requirement of the Water Code (which clearly states that the water pollution taxes should be defined based on the ecological status of the recipient water body), revising the list of pollutants, eliminating the reference to MACs and revising the rates of the water pollution taxes, to take into account the costs of the RBMP measures related to water quality improvements. It should be made it clear, however, that in the short-term the water pollution taxes cannot cover all the costs of the measures related to improvement of qualitative status of water bodies, but rather should contribute to certain improvements.

Finally, in order for the proposed reforms to be efficient, corresponding accompanying measures need to be developed, such as exploring earmarking mechanisms, i.e. re-allocation of revenues from the water abstraction fees and water pollution taxes back to the water sector. Otherwise, the implementation of the proposed reforms will contribute to increase of the state budget, without a guarantee that it would be re-directed back to the water sector. The overall aim of earmarking is to facilitate more efficient financial flows, and as a consequence enabling more efficient water management activities.

Thus, the main **pre-requisite for the proposed reforms** in water abstraction fees and water pollution taxes relates to adjustment of Article 17 of the Republic of Armenia Law “On Budgetary Systems” and fixing the percentage that is earmarked to the water sector. Article 6 of the law “On Fundamental Provisions of the National Water Policy” and Article 56 of the law “On National Water Program” should be used in this proposes, to support the proposed adjustments. This will make it possible to re-allocate revenues from the water abstraction fees and water pollution taxes back to water sector, thus facilitating more efficient financial flows, and as a consequence enabling more efficient water management activities in Armenia.

BACKGROUND

The "EU4Environment – Water Resources and Environment Data" Programme, financed by the EU with an overall budget of 12.75 mln Euro and implemented in Armenia, Azerbaijan, Georgia, Moldova and Ukraine, aims at preserving the partner countries' natural capital and contributing towards their environmental and climate resilience. The specific focus is on: (i) knowledge-based decision-making, further development of environmental statistics and monitoring and extending access to high-quality data as part of open government; and (ii) better management of water resources and further alignment with EU water law, in particular the Water Framework Directive.

The implementation period of the Programme is 2021-2024, and the implementing partners are: Environment Agency Austria, Austrian Development Agency, International Office for Water (France), Organisation for Economic Co-operation and Development (OECD), and United Nations Economic Commission for Europe (UNECE).

The expected outputs of the Programme, led by OECD, relate to further improvement of economic soundness of water strategies and policies in EAP countries through enhancing economic instruments for water management, identifying subsidies that impact efficient use of water, and analysis and providing recommendations on water pricing; and support to the mobilisation of financing for strategic priorities.

In particular, Output 1.5 of the Programme aims to improve the economic soundness of water strategies and policies in Armenia, and includes the following activities:

- Development of a roadmap for improving policy coherence between actors operating across all aspects of water management and assessing the opportunities and barriers to development of economically and financially sustainable strategies and policies. Recognising the synergies and interlinkages between the expected features of the roadmap, the activities will be screened in terms of priority and sequence.
- Development of a roadmap to consider opportunities for reform of the water abstraction fees, including application in hydropower sector, maximizing impact of "polluter pays" principle, review of irrigation service fees and subsidies, including the move towards performance based allocations, water metering, smart technologies practices and new markets including organic agriculture.
- Performance of a review of water user associations to understand differences in technical and economic performance.
- Consideration of opportunities for earmarking sector revenues and the potential for a revolving fund.

This study, prepared within the outputs of the Programme led by OECD, conducts a national review for Armenia on opportunities and prerequisites for reforming water abstraction fees and

water pollution taxes in Armenia. While these economic instruments have been in force in Armenia for over two decades, they still have certain weaknesses and need strengthening. The updated Water Code of Armenia in 2022 provides a fresh impetus for this, and creates a potential to help supporting the improvement management of water resources and its financing.

The overall goal of this study is to take the reform on economic instruments in water management in Armenia one step further, by supporting development of a road map that paves the way to the reform of the structure and level of water abstraction fees and water pollution taxes in Armenia.

Achievement of this overall goal requires implementation of the following tasks: (1) Objectives and main priorities of the reform; (2); Reform options and expected impact; (3) Prerequisites for the reform and opportunities for earmarking; and (4) Final report, compiling the key messages, findings and recommendations on reforming the water abstraction fees and water pollution taxes in Armenia.

This report, thus, summarizes the analysis of the above-mentioned tasks and more specifically performs the following:

- clarifies the key objectives of water management to be pursued by the proposed reforms,
- defines of the main priorities of the reform;
- proposes options for reforming the structure and level of the water abstraction fees and water pollution taxes,
- summarises the expected performance and benefits of the proposed options, in terms of environment and social-economic impacts.
- Identifies the pre-requisites for the reform, highlighting the required changes to be implemented to support the reform, including legal considerations and changes, and
- considers the opportunities for earmarking sector revenues, including the practical application.

As such, this report aims to facilitate policy discussions on the challenges and opportunities for reforming water abstraction fees and water pollution taxes in Armenia. It also aims to serve as an input for policy makers to the development of a road map for consideration of opportunities for reforming water abstraction and environmental fees in Armenia, which could significantly improve and expand the application of “user pays” and “polluter pays” principles, ensure the fairness in terms of charging all user groups in a fair and balanced way, and generate significant additional revenue for financing water sector of the country.

1. ECONOMIC INSTRUMENTS FOR WATER MANAGEMENT IN ARMENIA

The economic instruments in the water sector of Armenia are being applied for over two decades. With the adoption of the Water Code in 2002, the use of economic instruments in water sector was expanded. Particularly, Chapter 11 of the Code includes provisions on financial and economic mechanisms of water management, and envisages application of the "polluter pays" and "user pays" principles in this context.

The Republic of Armenia Law "On Fundamental Provisions of the National Water Policy" (hereinafter referred to as the National Water Policy) (2005) and the Law "On National Water Program of the Republic of Armenia" (hereinafter referred to as the National Water Program) (2006) also contain provisions on "polluter pays" and "user pays" principles, as well as on ensuring the use of economic instruments in water management. Thus, Article 6 of the National Water Policy, includes provisions on development and application of economic and financial mechanisms to promote efficient water use, on application of the "polluter pays" and "beneficiary pays" principles, as one of the principles of the national water policy. Article 7 of the National Water Policy, which outlines the main principles of the water resources management, includes provision on water resources management based on the comprehensive economic valuation.

As for the National Water Program, Article 35 of the Law defines the economic mechanisms in water management, which includes "polluter pays" and "beneficiary pays" principles and requires that the state authorized bodies in the water sector develop alternative mechanisms of financing water resources management, using the improved application of economic mechanisms.

Thus, the key economic instruments applied in water management of Armenia are the water abstraction fees and water pollution taxes. They have two main functions: regulatory function - to reduce the negative environmental impact and ensure the sustainable use of water resources, and fiscal function – to generate financial resources for protection, management and monitoring of water resources and possibly increase the monetary flow for investments in the water sector.

These instruments are in force in Armenia for almost two decades, but despite this still do not ensure the full application of the "polluter pays" and "beneficiary pays" principles in the country yet. As a result, the financial revenues raised for water management are not enough and the existing economic instruments do not provide enough incentives to users for better and more efficient use of water resources. Thus, reforming economic instruments for water management in Armenia to make them more robust is prerogative.

1.1. Water abstraction fees

The main management objective for application of water abstraction fees in Armenia is to ensure rational use and efficient allocation of water resources, and to maintain minimum environmental flow. The fee is applied to drinking-household, industrial/technical, irrigation, fisheries and other sectors.

Originally, the rates for water abstraction fees were defined according to the Government of Armenia Resolution No 864 of December 30, 1998 ''On Rates for Natural Resources Use'' and its further amendments and the calculation method was based on the Republic of Armenia law “On Payments for Nature Protection and Natural Resources Utilization”, adopted by the National Assembly of Armenia on December 28, 1998 and further amended in subsequent years.

Since January 1, 2021 the law and the Government Resolution are annulled, and the rates for water abstraction fees and procedures for calculation of the fees are regulated by the Tax Code of the Republic of Armenia. Thus, according to Articles 204 and 205 of the Tax Code, the water abstraction rates vary according to water sources and sectors, as provided in the table below.

Table 1: Rates of Water Abstraction Fees in Armenia, AMD

Sector	Surface water, excluding Lake Sevan	Surface water, from Lake Sevan	Groundwater, suitable for drinking	Groundwater, not suitable for drinking
Fisheries*	1	1.5	1.3	1.3
Industrial/Technical	0.5	1.5	1.3	1.3
Drinking-household (except local self-governance authorities and water supply companies)	0.5	-	1.3	-
Drinking-household (local self-governance authorities and water supply companies)	0.025	1.5	0.065	0
Irrigation	0	0.2	1.3	0
Other	0.5	1.5	1.3	1.3

Source: Tax Code of the Republic of Armenia (2016) and its further amendments

Article 214 of the Tax Code defines the procedure for calculation of the fee for surface water abstraction and Article 215 for groundwater abstraction. According to these procedures, in case of surface water abstraction for fisheries located in Ararat and Armavir marzes (Ararat valley) the fee is applied on the 10% of the volume of total water abstraction, and for fisheries located in other parts of the country on the 5% of the abstraction volume. In case of abstraction from

groundwater sources, the abstraction fee is applied on 50% of the total abstraction volume for fisheries located in Ararat and Armavir marzes, and 5% in other regions of the country.

Figure 1: Location of Ararat valley
Source: USAID, 2016

There are several issues with the current system of water abstraction fees in Armenia. First, despite the requirements of the Water Code, the National Water Policy and the National Water Program, the "user pays" principles is applied only partially, and not in a fair manner and based on the equity principle.

As seen from the Table 1 above, a special lower rate has been introduced for the water supply companies and local self-governments in case of self-supplied communities, in order to support financial strengthening and rehabilitation of the water supply companies. This was done, however, over 20 years ago, when the country was trying to attract international operators, and currently there is a need to eliminate that special lower rate to provide incentives for the water supply companies to reduce water losses. For example, according to the report submitted to the Public Services Regulatory Commission, in 2021 the water losses of "Veolia Jur", the unified operator of water supply and sanitation in Armenia, composed 73.7%.

Water abstraction for irrigation purposes, which is by far the largest consumptive water use sector in the country, is not charged, if water is abstracted from surface bodies (except for Lake Sevan), and in case of abstraction from Lake Sevan the charges for irrigation are significantly lower, compared to other sector. This also contradicts to the logic of the Water Code, which clearly states

that the main principle of economic regulation of water resources use, restoration and protection is the chargeable water use.

Hydropower, which is the largest water abstraction sector in Armenia, until now does not pay any water abstraction fee. It should be noted, though, that taking into consideration the recommendations outlined in the report "Facilitating the Reform of Economic Instruments for Water Management in Armenia" (OECD, 2014), the Government of Armenia has already initiated a reform and introduced a water abstraction fee (0.1 AMD/m^3) for hydropower sector in the country. Corresponding changes were made in the Article 204 of the Tax Code of Armenia in 2022, which will enter into force from January 1, 2024.

Finally, there are some ambiguities in terms of the basis for calculation of water abstraction fees. Thus, while Article 203 of the Tax Code clearly states that the basis for applying water abstraction fee is the actual water abstraction, Article 201 of the same Code refers to calculating the fee based on the permitted quantity.

1.2. Water pollution taxes

The history of payments associated with discharging wastewater into the open water basin (environmental fees/pollution fees/water pollution taxes) date back to 1986, when the "Methodology for Assessing the Damage Caused to the National Economy by Environment Pollution" was adopted. In 1993 the Government of Armenia Resolution No 448 was adopted, which introduced the system of environmental (pollution) fees, in line with the logic of "polluter pays" principles. This system was further strengthened and was later on regulated according to the Republic of Armenia Law "On Rates for Environmental Fees" adopted by National Assembly on December 20, 2006.

Since January 1, 2021 the law was annulled, and the rates for water pollution taxes and procedures for calculation of the taxes are regulated by the Tax Code of the Republic of Armenia. Thus, according to Article 169 of the Tax Code, the charges per ton presented below are applied for discharging pollutants and their compounds into the water basins, as summarized in the table below.

Table 2: Rates of water pollution taxes in Armenia

Element	AMD per ton of discharge
Suspended Particles	6,890
Ammonium Nitrogen	6,630
Biological Oxygen Demand	23,920
Oil Products	265,980
Copper	1,331,070

Element	AMD per ton of discharge
Zinc	1,331,070
Potassium	130
Chloride	39
Nitrites	664,950
Nitrates	1,430
Total Phosphorous	52,000
Detergents	132,990
Heavy Metal Salts	664,950
Cyan and Cyanide Compound	664,950

Source: Tax Code of the Republic of Armenia (2016)

Apart from the pollutants mentioned in the table above, there are also payments associated to discharges of dangerous substances and compounds, for which the actual discharge exceeds the allowed marginal discharge volumes as indicated by water use permits conditions, or for which the water use permit condition does not indicate any allowed marginal discharges. In such case, the rate of the water pollution tax (P_{water}) for each ton of discharge of pollutants is calculated using the following formula: P_{water}=10,000 AMD/MAC_{fish}, where MAC_{fish} is the maximum allowable concentration for the given parameters for fisheries.

There are several major issues with the system of water pollution taxes in Armenia.

The first problem relates to that fact of using the maximum allowable concentration (MAC) for the given parameters for fisheries for parameters, for which the water use permit condition does not indicate any allowed marginal discharges. In this regards it should be noted that since 2011, Armenia is not using the system of old Soviet MACs in its water quality assessment, given the several evident drawbacks of the system:

- The idea of MACs was based on assessment of impact of pollutants at organism level, after which the assessment moved into general level. However, methodologically this approach was not correct;
- The system of indicators based on MACs did not take into account the synergism and antagonism of various pollutants;
- The applied system did not allow assessing how the level of exceeding MACs and duration of pollution impact on the ecological status of water bodies;
- The same value of pollutant MAC was applied to water objects in different physical-geographical zones;
- For assessment of surface water quality, several very important properties of pollutants, such as ecotoxicity, depend upon the specific water ecosystem and specific water chemical condition; and

- The system of MACs did not take into account the compound and multi-stage transformations of polluting substances after penetrating into the water.

Thus, Armenia decided to eliminate the system of MACs in surface water quality assessment system, and on January 27, 2011 Government of the Republic of Armenia Resolution No 75-N was adopted "On Defining Water Quality Norms for Each Water Basin Management Area taking into Consideration the Peculiarities of the Locality". It defines five classes of surface water quality in Armenia: I (high), II (good), III (moderate), IV poor, and V (bad). The classification is based on over 100 indicators, and for some indicators the background concentration is being used (the values of which vary for different river basins of Armenia). If different indicators of surface water body analysis show different quality classes, then the worst is taken in classification ("One out – all out" principle), i.e. if for certain water body one of the indicators shows poor (class IV) status, and all others show better status, that water body is classified as of poor status (class IV).

Another problem with the current system of water pollution taxes is only very partial application of the "polluter pays" principle. Thus, according paragraph 2 of the Article 169 of the Tax Code, for discharge of pollutants into Lake Sevan Basin, as well as Hrazdan and Getar Rivers in the territory of Hrazdan canyon the rates mentioned in the table above are doubled (except for the water supply companies). Naturally questions raises why the water supply companies are exempted from this provision, given that one of the main significant pressure sources on water quality in Armenia is coming from untreated urban/municipal wastewater.

Also, including only Lake Sevan basin, Hrazdan and Getar Rivers in this list is questionable, given that the River Basin Management Plans (RBMPs) developed in Armenia have revealed numerous water bodies at risk due to water quality, as summarized in the table below.

Table 3: Surface water bodies at risk due to water quality

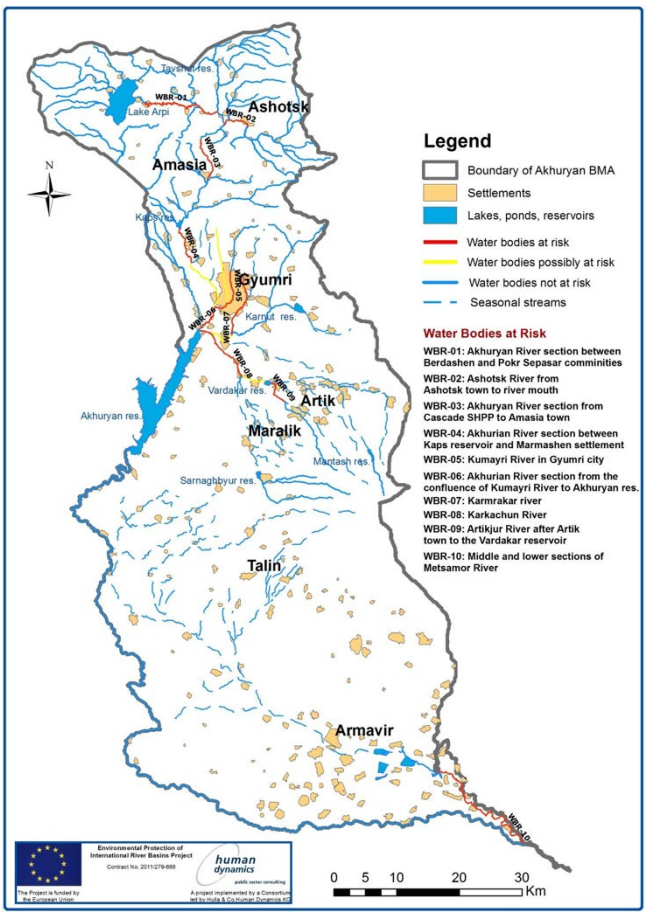
River Basin District	River	Section of the river at risk due to water quality
Hrazdan	Kasakh	From Aparan city until Aparan reservoir, from Ashtarak until the river mouth
	Gegharot River	Entire river stretch
	Halvar River	From Tukhmanuk gold mine until Meliqgyugh village
	Amberd River	From Byurakan until the river mouth
Akhuryan	Ashotzk River	From Ashotzk town until the river mouth
	Kumayri River	Entire river stretch
	Akhuryan River	From the confluence of Kumayri River to Akhuryan reservoir
	Karmrakar River	Entire river stretch
	Karkachun River	Entire river stretch
	Artikjur River	From Artik town until the Vardakar reservoir
	Metsamor River	Downstream of confluence with Kasakh River until the river mouth

River Basin District	River	Section of the river at risk due to water quality
Southern	Vorotan River	From Sisian city until Shamb reservoir
	Ayriget River	From the confluence with its Kishkort tributary until Torounik village
	Kishkosht tributary	From Dastakert mine until the river mouth
	Gorisget River	From Broun village until the state border
	Voghji River	From the Zangezur copper-molybdenum factory until the confluence with Geghi River, from the territory of Kapan city until the state border
	Tsakqar River	From the confluence point with Manakajur until the river mouth
	Darapi River with its tributaries	Until the Darazam tailing dam
	Right tributary of Geghi River	From water purification structures of “Ler-Eks” LLC until the river mouth
	Geghi River	From the confluence with that tributary until Nor Astghaberd settlement
	Kavart River	From Kapan copper-molybdenum mine until the river mouth
	Vachagan River	In the territory of Kapan city
	Geghanush River	From Geghanush tailing dam until the river mouth
	Norashenik River	From Artsvanik tailing dam pipeline until the river mouth
	Meghrivet River	Between Tkhtut and Vardanidzor settlements
	Karchevan River	From Agarak copper-molybdenum factory until the river mouth
	Khachidzor River	From the Agarak mining waste landfill until the Darrazam tailing dam
Ararat	Goght River	From sources until the confluence with Azat River
	Azat River	From Azat reservoir until the river mouth
	Vedi River	From Urtzadzor settlement until the river mouth
	Arpa River	From Jermuk city until Kechut reservoir, from the confluence with Azatek tributary until the river mouth
	Malishka River	Entire river stretch
	Gladzor River	From Vernashen until the confluence with Arpa River
	Yeghegis River	From Shatin River until the river mouth
Northern	Pambak River	Section encircled by Nalband Canal, from Spitak city until the confluence with Dzoraget River
	Tandzut River	In the territory of Vanadzor city
	Alaverdi River	Entire river stretch

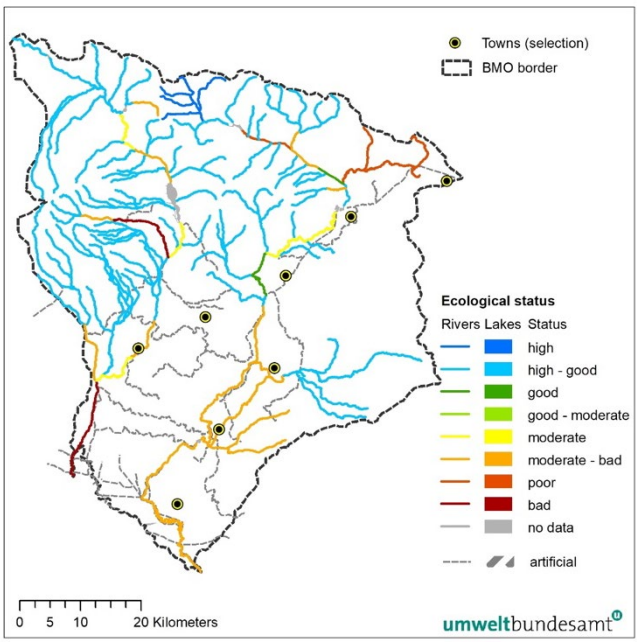
River Basin District	River	Section of the river at risk due to water quality
	Debed River	From the confluence of Pambak and Dzoraget Rivers until Tumanyan city, from Alaverdi city until Haghtanak village
	Akhtala River	Lower and middle reaches
	Chochkan River	Below Chochkan tailing dam
	Dzoraget River	From Stepanavan city until the confluence with Urut River
	Getik River	From Chambarak city until Getik River mouth
	Aghstev River	From Lernotovo community until the confuelnce with Getik River, from Ijevan city until the Armenia-Azeri border

Source: Compiled from existing and draft RBMPs (2023)

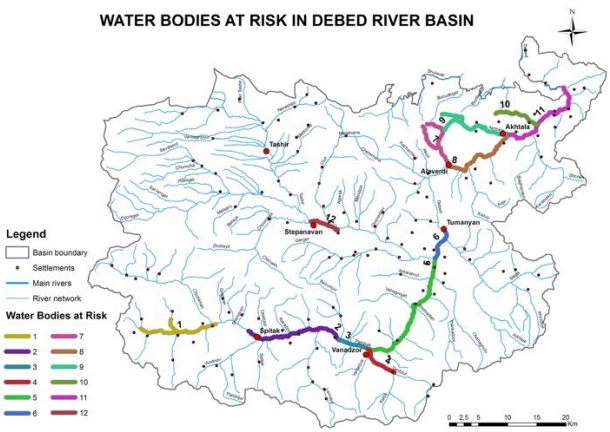
Thus, like the case for Lake Sevan basin, Hrazdan and Getar Rivers, the same approach should have been applied for discharging pollutants into these water bodies, if the logic of the Tax Code is to prevent excessive discharge of pollutants into rivers being at risk of water quality.



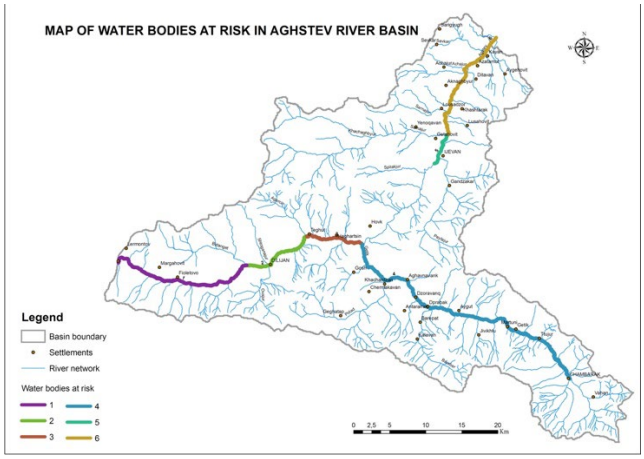
(a) Akhuryan River Basin District



(b) Hrazdan River Basin District



(c) Debed River Basin



(d) Aghstev River Basin

Figure 2: Maps of surface water bodies at risk due to quality in different river basins of Armenia
Source: Compiled from officially adopted (Akhuryan RBD, Hrazdan RBD) and draft (Northern RBD) RBMPs

The existing system of water pollution taxes in Armenia, thus, contradicts with the logic of the Water Code of Armenia, which clearly states that one of the basis for defining the water pollution tax is the ecological status of water body, which receives the wastewater. Also, according to the Water Code, the type of wastewater and the level of their impact on water resources should be taken into consideration while defining the water pollution taxes, which is not the case now.

Finally, the current system of water pollution taxes also violates the "polluter pays" and the equity principle, given that one of the most important pressure factors on water quality – the water supply and sanitation companies, are given special privileges. Also, the list of pollutant should be revised to incorporate the significant pressure from all sectors, taking into consideration the findings of the RBMPs.

At a more general level, there are ambiguities in terms of the objectives of the current system of the water pollution taxes in Armenia, and it's not clear whether they aim to prevent the pollution of water bodies due to discharge of pollutants, compensate the damage caused due to pollution, reduce the damage or something else.

2. OBJECTIVES AND MAIN PRIORITIES OF REFORMING WATER ABSTRACTION FEES AND WATER POLLUTION TAXES

2.1. Rationale for reforming water abstraction fees and water pollution taxes

Abstraction fees and water pollution taxes were established 20-25 years ago to trigger a cultural change in water management in Armenia, so that users could internalize the (negative) impacts of their activities into their decision making. However, current rates have proven to be too low to provide either sufficient revenues for water management or an incentive for a more efficient water use.

The total financial revenues from water abstraction fees and water pollution taxes are very low as compared to the full costs of activities that would be required to achieve the water management objectives defined in the Armenian law. This results from low levels of unitary fees that do not provide an incentive for efficient water use and do not internalize the full environmental and resource costs.

In the case of water abstraction fees, some water use sectors are exempted or partly exempted from paying the fees. In particular:

- The hydropower sector is exempted from paying water abstraction fees;
- Water abstraction for irrigation purposes is not charged if water is abstracted from surface water bodies (except for Lake Sevan) or in case of water not suitable for drinking purpose extracted from ground water bodies. In case of abstraction from Lake Sevan, charges for irrigation are significantly lower than charges for other sectors (0.2 AMD/m^3 versus 1.5 AMD/m^3);
- Water abstraction charges for public water supply companies were significantly reduced about twenty years ago (from 1 AMD/m^3 to 0.025 AMD/m^3), while they represent significant water users. Self-supplied rural settlements (around 560 in the whole country) pay the full charge (1 AMD/m^3);
- Fish farms are paying a minimal water abstraction fee. Even the 10-fold increase of groundwater abstraction fee for Ararat and Armavir marzes of Armenia since 2004, where due to over-abstraction, the groundwater resources in Ararat Artesian Basin have significantly depleted, still gives them unjustified special treatment and advantage over other water use sectors, given that the fee is applied only on 50% of the total volume of abstracted groundwater for fish farms located in Ararat and Armavir marzes, and even much less – 5%, for fisheries located in other regions of the country. The comparative analysis of estimated revenues of fisheries and abstraction fee actually paid (USAID, “Achieving Sustainable Groundwater Use in the Ararat Valley: the Role of the Fishery Sector”, 2016) suggests that the

water abstraction fees in Ararat and Armavir marzes represent less than 1.9% of revenues of fish farms.

In the case of water pollution taxes, the calculation of the total amount to be paid by each polluter is extremely complex as it is based on a very long list of pollutants. This complicates both the calculation of the total amount to be paid and its reporting. In spite of this complexity, the current fee does not fully take into account risk considerations and the different vulnerability and environmental quality/interest of individual water bodies.

At a more general level, very low charge levels, as well as the unfair distribution of charges among users' groups, reveal a poor application of the "user pays" and "polluter pays" principles, despite the fact that these principles are one of the pillars of the current water-related Armenian legislation (in line with the EU WFD).

2.2. International Experience

2.2.1. EU WFD context

The section summarises the review on "Using economic instruments for supporting the implementation of the WFD: what do two decades of WFD implementation tell us", conducted by Acteon (2019).

The EU WFD, adopted in 2000, brought many novelties and innovation in the field of water management and policies in Europe, one of these being the explicit integration of economic issues, methods and instruments into the Directive's philosophy and obligations. With regards to economic instruments, Article 9 of the WFD dedicated to water pricing (a generic term including tariffs for water services, water taxes and water charges) requires: (a) an adequate recovery of the costs of water services, including environmental and resource costs; (b) that water pricing provides an incentive for supporting the achievement of the objectives of the WFD. On the consideration of environmental and resource costs, practice includes presenting (a) existing environmental taxes/charges as indicators of environmental and resource costs being already duly considered (internalized) or (b) the costs of measures required for achieving good water status as a proxy of environmental and resource costs not yet internalized.

EU member states are applying a diversity of economic instruments (water tariffs, water charges & taxes, subsidies, etc.) for supporting the management of aquatic ecosystems and the wise use of water resources. This includes water tariffs, environmental charges or taxes, subsidies and contractual arrangements.

- **Water tariffs** are introduced for drinking/irrigation water supply and for sewage and treatment services. Their level and structure varies widely within the EU as a result of differences in sources of water (surface water, groundwater), distance between resources and use, technologies required (gravity flow/pumped, treatment of raw water, treatment of polluted effluents), level of scarcity or sensitivity of receiving waters, seasonal peaks in water use and other factors.
- **Environmental charges or taxes** on abstraction, pollution and hydro-morphological pressures, which are usually applied on activities imposing pressures on water resources or on activities selling polluting products, the use of which is at the origin of pressures on aquatic ecosystems (e.g. pesticides tax).
- **Subsidies** supporting investment and changes in practices that help reducing pressures on aquatic ecosystems, can be used/applied to: (a) support the spreading of innovative technologies and solutions in their early development phase; (b) support changes in practices and investments expected to have important financial and economic consequences. Such subsidies can be part of budgets of water authorities, specific water funds or coming from sector financing.
- **Contractual arrangements** based on the philosophy of "payments for ecosystem services", which is the most commonly applied, is a contractual arrangement between water supply companies and farmers for financially supporting changes in farm practices that reduce (polluting) pressures on water resources used for drinking purpose.

2.2.2. Water abstraction charges

Water abstraction charges are in place in number of EU, OECD and other countries. As table below illustrates, practice with water abstraction charges is not uniform between the countries – it varies in a number of important respects.

Table 4: Features of water abstraction charges in selected countries and regions

Country	Basis of charge	Differences for sectors	Differences for other characteristics	Water source to which the charge applies
Belgium (Flanders)	Abstraction volume	-	Scarcity in aquifer	Groundwater
Canada (British Columbia)	Abstraction volume; Licensed amount; Per mwh (power)	yes	-	-
Canada (Nova Scotia)	Abstraction volume; License fee	yes	-	-

Country	Basis of charge	Differences for sectors	Differences for other characteristics	Water source to which the charge applies
China	Minimum price per abstraction volume	-	Location	Surface water Groundwater
Czech Republic	Abstraction volume	yes	-	Groundwater
Estonia	Abstraction volume	yes	Source aquifer	Surface water Groundwater
France	Abstraction volume			
Germany Baden Wurttemberg	Abstraction volume	yes	-	Surface water Groundwater
Germany Hamburg	Fixed amount for agriculture and private use; Fixed amount and price per abstraction volume for commercial uses	yes	-	Surface water
Germany Saxony	Abstraction volume	yes	-	Surface water Groundwater
Hungary	Abstraction volume	-	Region	Surface water Groundwater
Israel	Abstraction volume	yes	Season	Surface water Groundwater
Japan	Abstraction volume	-	Location	Surface water
Korea	Abstraction volume	-	Source river	Surface water
Latvia	Abstraction volume	yes	-	Surface water Groundwater
Lithuania	Abstraction volume	yes	-	Surface water Groundwater
Luxembourg	Abstraction volume	-	-	-
Poland	Abstraction volume	yes	Water quality and region	Surface water Groundwater
UK	Licensed amount of abstraction volume	-	-	-

Source: Adapted from OECD (2018)

As seen from the table above, most of the abstraction charges are based on the price per volume of water abstraction. However, in many cases the charges are differentiated according to the water use sectors, sources and types. The charges may apply only to certain sectors, some sectors

might be excluded from the charge, or different rates applied according to sector (agriculture, industry, water utilities, fisheries, forestry, hydro and thermal power, etc).

In many countries differentiated charges are applied for groundwater and surface water. Charges for groundwater are normally higher, due to the fact that it is often in part non-renewable, and difficult to restore once depleted or contaminated.

Water abstraction charges also vary among countries in their purposes and the basis for the charge. While in some countries the basis for charge is the volume of water abstracted, in other countries where the measurement of water abstraction is not feasible, the charge is based on licensed/permitted amount, according to the ceiling allowed on abstraction. In other cases the charge is fixed per hectare of land farmed (in case of irrigation water abstraction). There is also variation in terms of application of the abstraction charges, ranging from raising general revenue, raising revenue for specific kinds of water resources management to comply with the WFD, to create incentive for efficient use of water, to limit water extraction in water-stressed area and others.

There is wide variation in terms of level of charge. In general, the level is low, and is limited by the requirement to recover only the costs of administering the regime of monitoring and regulation. Countries using the charge to create an economic incentive for efficient water use typically levy higher rates. One of the highest rates, applying to both groundwater and surface water abstraction, is in Denmark (EUR 0.84/m^3). For groundwater, the Netherlands charges EUR 0.1826/m^3, and Poland EUR 0.015-0.0255/m^3.

In terms of non-consumptive use, the sectors with a high proportion of non-consumptive use (commonly, hydropower and cooling for thermal power) are typically charged at a lower rate. In France, abstraction fees are charged on the total volumes passing through the plant's turbines multiplied by the waterfall's height. In Italy abstraction fees for the hydropower sectors are charged on the nominal production of the plant and include three components, charged according to the production threshold (water concession fee, supplementary abstraction fee for mountainous river basins, supplementary fee for local authorities). In England hydropower plants need to apply for an abstraction license, which implies the payment of a flat application fee and a volumetric charge. In Brazil hydropower producers are charged 6.7% of the value of energy produced, and the proceeds are allocated to the states and municipalities, where this activity takes place, to be used for water management amongst other things.

Finally, in terms of destination of the collected revenues, the proceeds of the water abstraction charges go to the state/national budget, are earmarked for specific programs or targeted measures, or directed to local budgets.

2.2.3. Water pollution charges

International practice in the use of pollution charges also varies between the countries, and between the states and regions of the same country.

Table 5: Features of water pollution charges in selected countries

Country	Type of instrument	Based on
Canada – British Columbia	Charge on discharge	Pollution content, weight
Canada – British Columbia	Charge on agricultural inputs	Volume of pesticides
Denmark	Sewage discharge	Volume (water) weight (pollutant)
Denmark	Duty on chlorinated solvents	Weight. Pollution content
Denmark	Duties on nitrogen and pesticides	Weight
Denmark	Tax on mineral phosphorous and control of pollution	Pollutant content, sector, volume
India	Tax for prevention and control of pollution	Pollutant content, sector, volume
Italy	Duty on pesticides	% of previous year's turnover on sale of pesticides
Mexico	Water effluent charges	Quantity of wastewater in excess of permissible contents of COD and TSS, depending on carrying capacity of recipient body
Netherlands	Levy on water pollution	Pollution unit, amount of effluent
Spain	Tax on wastewater discharges	Sector, volume
USA - Florida	Water quality tax	Pollution content, volume
USA - Maryland	Bay restoration fund fee	End user, type of sewage disposal system
USA - Washington	Hazardous substances tax (pesticides)	% of wholesale value

Source: Adapted from OECD (2018)

In general, OECD countries have managed water quality through regulation (e.g. setting standards for ambient water quality, technology requirements and banning certain kinds of discharges into water bodies). Those countries that have made active use of pollution charges have done so partly to reinforce the distinctive for water pollution, and partly to raise revenues to fund environmental policies.

Another general point is that environment impact (and cost) of water pollution is highly specific, dependent on location, the nature and timing of the discharge, the dilution capacity of the water

course, and other factors. Hence, water pollution charges should vary to reflect these specific factors.

2.3. Key objectives and main priorities of the reforms in Armenia

The key objectives and main priorities of reforming water abstraction fees and water pollution taxes are identified and developed based on the following:

- The requirements of the Armenian legislation, and particularly the National Water Policy and National Water Program;
- Reforms in water abstraction fees and water pollution taxes in Armenia, undertaken since 2004;
- The outcome of the previous studies supported by the OECD in Armenia;
- Interviews and discussions with national authorities and main organizations involved in the implementation of existing instruments, particularly the Water Policy Department, Water Resources Management Department and the Department of Strategic Programs of the Ministry of Environment of Armenia, as well as the Hydrometeorology and Monitoring Centre - so the main areas for improvements are more clearly specified;
- The review of the literature on economic instruments applied international and particularly within the EU WFD context – so possible options that might best contribute to the set objectives are identified.

In terms of legislative requirements, Article 6 (Principles of the national water policy) of the National Water Policy contains provision on targeting water abstraction fees and water pollution taxes at activities, supporting sustainable water resources management and handling current environmental problems in the sector. Article 35 (Economic mechanisms) of the National Water Program requires that the state authorized bodies in the water sector perform a medium and long-term cost estimates for the management of water resources and assessment of alternative funding mechanisms for those expenditures. These alternative mechanisms shall cover detailed recommendations on the improvement of the system of water abstraction fees and water pollution taxes, relating to water resources monitoring, water use permitting and compliance assurance.

Some of the key objectives were set in accordance to the OECD principles for water resource management financing, and in particular:

- Polluter pays principle: economic sectors which pollute water resources must adequately contribute to the environmental costs of pollution;
- Beneficiary-pays principle: beneficiaries of water services (as well as other benefits linked to sound water management) must adequately contribute to the provision of these services. This

principle is closely linked to the concept of cost-recovery: the costs of providing water services must in fact be covered by the beneficiaries of such services (i.e. water users).

The OECD also indicates other two principles to be followed in water resource management. The equity principle, which includes affordability issues, will be addressed in the context of the impact assessment of the proposed options for reform: the proposed reform must in fact be equitable and affordable for everyone and, in case it is not, specific accompanying measures will need to be brought forward to ensure that this principle is reflected by the reform. The last principle, policy coherence, stresses the need of coordinating all other sectoral policies (e.g. agricultural policies), which might have an impact on water resources.

Thus, the reforms in water abstraction fees and water pollution taxes are proposed in terms of short and medium and long-term objectives (likely in 10 years or more in the context of the next significant review of water policy in Armenia).

The proposed reform in of **water abstraction fees** could pursue the following objectives:

- **Short-term objective**: revenues from water abstraction fees must be sufficient to cover all expenses involved in proper management of water resources, water policy implementation, water resources monitoring, and compliance assurance with water use permit conditions.
- **Medium- and longer objective**: fee rates should take into account the resource costs of water abstraction, as well as provide an incentive for a more efficient use of water resources (reduced water abstraction).

Also, in the short-term it is proposed that for water abstraction the fees are based on the **permitted quantity** instead of **actual water abstraction**, as it is the case now. This will help avoiding high administrative capacity and high transaction costs required for managing the system. Otherwise, the way the system operates now, it does not give water users the incentive to request for permits that are close to their water requirements, a situation that might indirectly block the opportunity to issue additional water use permits that could contribute to the socio-economic development, while bringing additional financial revenues from water abstraction fee collection.

The proposed reform in **water pollution taxes** could pursue the following objectives:

- **Short-term objective**: revenues from water pollution taxes should take into account the costs associated to implementation of the measure from the RBMPs aimed at improving the qualitative status of water bodies at risk due to water quality.
- **Medium- and long-term objective**: fee rates should take into account of the environmental costs of pollution, as well as provide an incentive for reduced polluting discharges in coherence with the need to protect aquatic ecosystems and their related uses.

In more practical terms, the main **priorities** for the reform include:

- **Fairness**: all user groups must be charged in a fair and balanced way, applying charge rates closer to the environmental impacts (environmental and resource cost) of abstracting water and discharging pollutants.
- The full application of the **user-pays and polluter-pays principle**.

3. REFORM OPTIONS AND EXPECTED RESULTS

3.1. Reform options for water abstraction fees

3.1.1. State budget allocation to water policy, management, protection, monitoring and compliance assurance

According to the information provided by the Ministry of Environment of Armenia, almost 173 million AMD was provided from the state budget for water resources management, protection and water policy needs in Armenia in 2021. The breakdown is provided below:

Table 6: State budget allocation to water policy, water resources management and protection in 2021

No	Description	Thousand AMD
1	Salaries	
	Water Resources Management Department	148,875.11
	Water Policy Department	18,261.76
2	Rent to territories	1,886.69
3	Transportation costs	3,760.10
Total		172,783.66

Source: Ministry of Environment of the Republic of Armenia (2023)

As for surface and groundwater resources quantity and quality monitoring, according to Hydrometeorology and Monitoring Centre, in 2021 about 383 million AMD was allocated from the state budget of Armenia.

Table 7: State budget allocation to water resources monitoring in 2021

No	Description	Thousand AMD
1	Surface water quality monitoring	107,000.00
2	Surface water quantity monitoring	223,000.00
3	Groundwater monitoring	53,000.00
Total		383,000.00

Source: Hydrometeorology and Monitoring Centre of the Ministry of Environment (2023)

Regarding the activities related to compliance assurance with water use permit conditions, the Environmental Protection and Mining Inspection Body (EPMIB) could not clearly differentiate the specific state budget funding to water sector, given that the breakdown of the state budget allocations is provided according to other categories. However, in consultation with the representatives of the EPMIB, an approximate estimate was made on the allocation to compliance assurance activities related to water sector, which for 2021 is assessed as approximately 224 million AMD.

Thus, overall, in 2021 the state budget allocation to water policy, water resources management, protection, monitoring and compliance assurance with water use permit conditions has composed about **780 mln AMD**. Having said this, it should be noted that these functions have largely remained underfunded, and in reality the needs are significantly higher.

Thus, the Basin Management Organisations (BMOs) of the Water Resources Management Department (WRMD) of the Ministry of Environment of Armenia are still very week and suffer significant lack of human resources. While during the early stages of the reforms, targeted at decentralized water resources management in the country (early 2000s), each of the 6 BMOs in the country had up to 6-7 employees, currently the average number of BMO employees is 2-3 in each basin (covering on average 5,000 km^2 of area), which significantly impacts on the efficiency of the work. With the official adoption of the RBMPs and increasing role of BMOs in overseeing the implementation of the RBMPs the number of staff should be at least tripled compared to current staffing.

WRMD itself also needs strengthening in terms of additional staff at national level, who will be able to perform GIS, spatial analysis and modelling works also. Several projects indicated the need of WRMD in significant strengthening of "human infrastructure" to be able to prepare and implement RBMPs, water resources planning and coordinate water-related data management and open data activities. Thus, about 20% of staff increased is proposed for the WRMD. Thus, WRMD and BMOs would need **additional 84 mln AMD** of financing annually.

Water Policy Department of the Ministry of Environment currently has only 4 employees, which makes it extremely difficult to perform the tasks in an efficient manner, given the responsibility for development of the vast strategic and legal framework in such a challenging and cross-cutting sector, as the water. Also, it should be noted that with the signature of the Comprehensive and Enhanced Partnership Agreement with the EU, Armenia has undertaken ambitious and time-bound commitments to reform water policies and implement 5 water-related EU Directives (Water Framework Directive, Water Framework Directive, Drinking Water Directive, Nitrates Directive, Floods Directive), where the role of the Water Policy Department is crucial. At least doubling of the staff of the Department would be required to be able perform these activities decently, which means **additional** funding of **18 mln AMD** annually.

Despite significant progress achieved in surface and groundwater quantity and quality monitoring in Armenia over the past years, the state budget allocation to monitoring is by far not enough. For example, the national reference groundwater monitoring network currently comprises 119 observation sites versus over 200 sites existing during the Soviet Union. In the Northern RBD, covering an area of 7185 km^2, the groundwater monitoring network consists of 2 observation sites only.

In terms of hydrological monitoring, the Water Sector Adaptation Plan adopted by the Government of Armenia in November 2022, proposes establishment of 14 new hydrological posts at flow formation zones of the river basins for conducting regular measurement of water level, river flow, and water temperature in order to conduct more accurate assessment and forecast of river flow changes in the country under climate change. And while the surface water quality monitoring network has relatively good coverage, the state budget allocation to the laboratory maintenance is still at insufficient level and in most cases the Hydrometeorological and Monitoring Centre (HMC) relies on external assistance, including from the international organizations.

Given the short-term plans of the laboratory of the HMC to obtain ISO 17025 accreditation, as well as the requirements of Armenia undertaken by the Comprehensive and Enhanced Partnership Agreement (CEPA) with the EU to establish WFD compliant monitoring program (Article 8) by March 1, 2026, the state budget funding to surface and groundwater monitoring in Armenia has to be significantly increased. While there are no accurate assessment on this, the assessment of already officially adopted RBMPs and the program of measures (supplementary measures), as well as earlier assessments performed by EU-funded projects on introduction of biological monitoring in different pilot basins of Armenia, indicate that very roughly at least double of budget currently allocated for monitoring needs would be required in terms of surface water quality and groundwater monitoring. As for hydrological monitoring, at least 30% of the budget increased would be required. Thus, for water resources monitoring annually **227 mln AMD** would be required **additionally**.

The state budget allocations to the EPMIB was not enough for proper implementation of functions assigned to the Inspectorate. Due to insufficient funding, inadequate laboratory infrastructure and equipment, and insufficient level of appropriately trained personnel, the activities related to compliance assurance with water use permit conditions are largely impaired, and for many water users and polluters there is no reliable information whether they comply with the provisions mentioned in the water use permits or not. There are no current reliable estimates on how much increase of state budget allocation would be required to improve the inspectoral performance in water sector, but some earlier reports suggest that at least 70%-80% of budget increase would be required, which makes it **168 mln AMD** of **additional** financing annually.

3.1.2. Revenues from the water abstraction fees

The revenues from the water abstraction fees have been constantly growing over the last decade. According to the Statistical Committee of Armenia, in 2017 the revenues from the water abstraction fees composed 401 mln AMD, while in 2021 this figure was increased up to 650.7 mln AMD, composing about 22.6% of the total payment for natural resources use in the country. Annex 1 provides detailed breakdown of the dynamics of revenues from water abstraction fees by marzes of Armenia over the period 2017-2021.

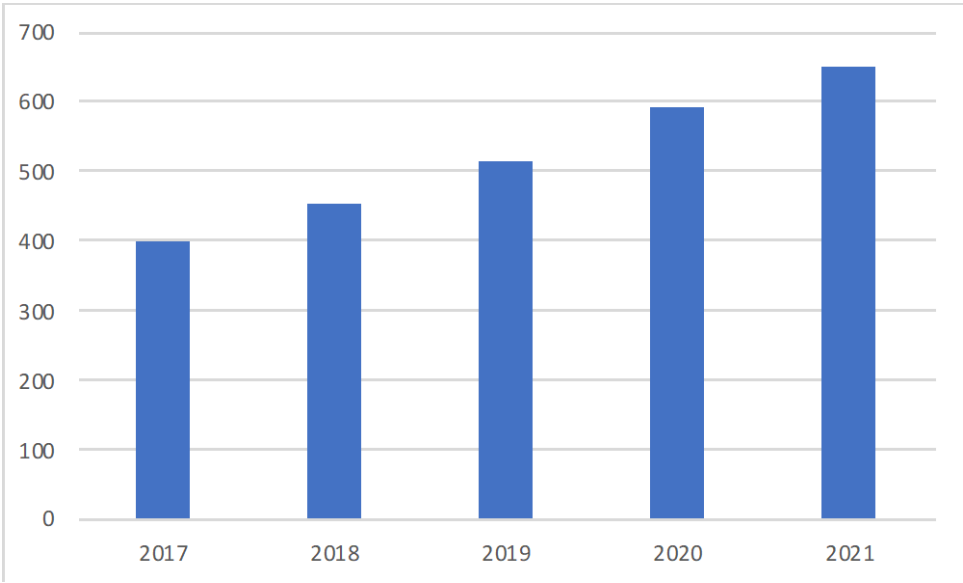


Figure 3: Dynamics of revenues from the water abstraction fees over the period of 2017-2021, in million AMD

Source: Compiled from data of the Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

The increase of the revenues from the abstraction fees is largely due to reforming the fee structure in 2014 and introduction of obligatory water flow metering requirement for all groundwater uses in the country, including for the fish-farming sector. More specifically, in 2014 the Law "On Nature Protection and Nature Utilization Payments" was revised and for the fish farms located in Ararat valley (Ararat and Armavir marzes) the 50% of the overall abstracted volumes of water became subject to fee, instead of 5% previously in force, to respond to the groundwater depletion problems and quantitative management issues encountered in the valley.

Referring specifically to the year 2021, the breakdown of the revenues generated from the water abstraction fees by provinces/marzes and by water use sectors is provided in the table below.

Table 8: Breakdown of the revenues from water abstraction fees by marzes of Armenia and water use sectors, in thousand AMD

Marz	Total	of which: by type			
		Drinking	Irrigation	Technical	Fish-farming
Yerevan city	161351.3	53389.8	59566.4	5694.2	42700.9
Aragatsotn	2078.4	597.7	0	1393.6	87.1
Ararat	352839.3	8.1	0	7429.0	345402.2
Armavir	60181.9	896.4	0	13598.9	45686.6
Gegharkunik	3900.7	904.3	1010.0	47.7	1938.7
Lori	3439.3	289.3	0	3143.5	6.5
Kotayk	4674.1	115.7	0	3472.5	1085.9
Shirak	4702.4	222.1	0	156.8	4323.5

Marz	Total	of which: by type			
		Drinking	Irrigation	Technical	Fish-farming
Syunik	56423.4	429.8	0	55939.9	53.7
Vayotz Dzor	679.2	430.0	0	59.3	189.9
Tavush	453.6	53.3	0	400.3	0

Source: Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

As the table above and the diagrams below demonstrate, the largest share of water abstraction fees (68%) belongs to the fish-farming sector of Ararat valley, followed by technical water use sector (14%). Irrigation, which is the largest consumptive water use sector in the country, accounts only 9% of the water abstraction fees, almost the same figure as for the drinking water sector, the overall share of which in the water abstraction composed only 5.4% in 2021.

In terms of the breakdown by marzes, Ararat valley, including Ararat and Armavir marzes, accounts to about 63% of all revenues from the water abstraction fees in the country, largely due to the fish-farming sector.

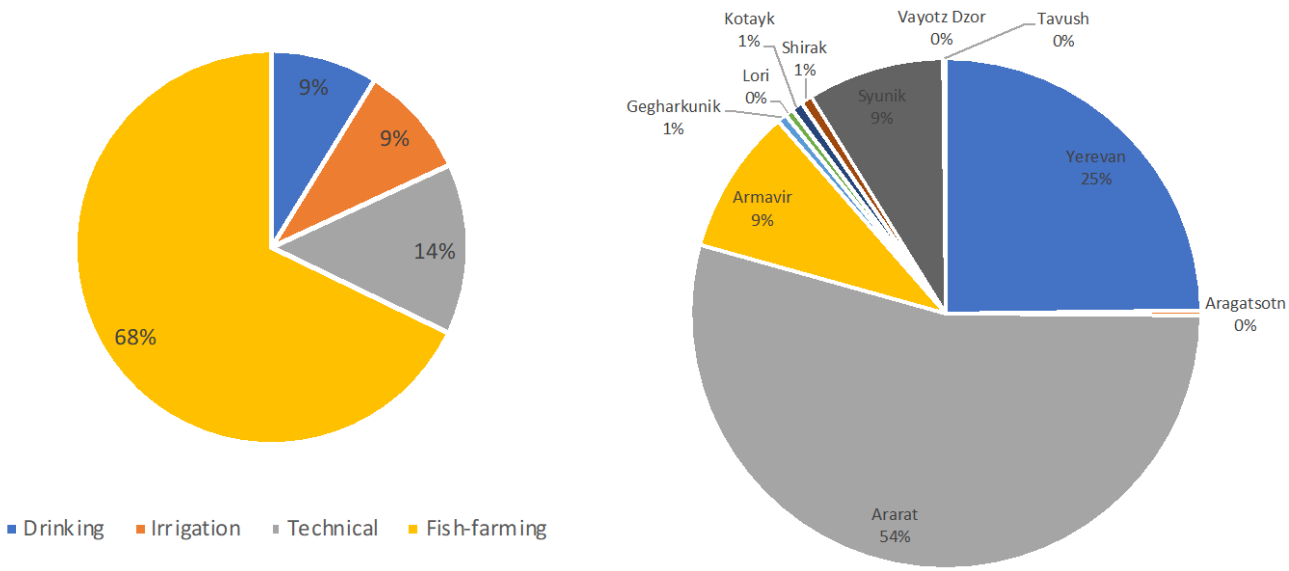


Figure 4: Breakdown of revenues from water abstraction fees by sectors and by marzes in 2021
Source: Compiled from data of the Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

As for the hydropower sector, in 2021 it was still exempted from paying water abstraction fee, despite the fact that in 2021 about 70% of all water abstraction (including hydropower sector) accounted to it.

Despite the progress made in collection of water abstraction fees over the past years, there is plenty of opportunities for improvement of the water abstraction fee system, without causing significant social-economic impact to the water use sectors.

Thus, since January 2024 the hydropower sector will be paying very small (compared to other sectors) water abstraction fee (0.1 AMD/m^3), but due to very large share in overall water abstraction, it will contribute about **676 mln AMD** annually to the revenues from water abstraction fees, if the current water abstraction pattern remains.

The consultations with the representatives of the beneficiary organizations, as well as the results of the analysis of fishery sector in Armenia valley (USAID, 2016) indicate that the reforms of water abstraction fees in fish-farming sector could be continued, and like for other water use sectors, the abstraction fee could be applied on 100% of the volume of total water abstraction (instead of 50% for Ararat valley and 5-10% on other regions of the country) for fish-farming sector as well. In such case on an annual basis additional **484 million AMD** could be generated as revenues from the water abstraction fees.

As for the drinking water supply sector, it is proposed to eliminate the special lower rate introduced over 20 years ago and set the water abstraction fee at the rate of 0.5 AMD/m^3 for all abstractions for drinking-communal purposes. This would create incentives to reduce the water losses amounting to over 73%, will create additional **204 mln AMD** of revenues from the water abstraction fees, at the same time not causing any significant impact on the cost structure of the water supply companies and eventually on the tariff for the households. Even after the increase of water abstraction fee for drinking-communal needs up to the rate of 0.5 AMD/m^3, it would constitute only about 0.29% of the tariff for the drinking water supply services, which currently composes 170.4 AMD/m^3.

Finally, for the irrigation sector there is an absolute need to revise the fee of 0 AMD/m^3 for surface water abstraction, excluding Lake Sevan and for groundwater, not suitable for drinking purposes. This contradicts with the approaches and principles outlined in the Water Code, National Water Policy and National Water Program of Armenia, and provides the largest consumptive water use sector in the country unjustified and unnecessary privileges. Thus, it is proposed to start charging very small fee of 0.1 AMD/m^3 for the irrigation sector for surface water (excluding Lake Sevan) and for groundwater (not suitable for drinking purposes) to make the irrigation sectors used to the principle of “user pays”.

The analysis shows that introduction of such rates could annually generate additional **156 mln AMD** of revenues from the water abstraction fees without significant impact on the water sector. The thing is that in the costs structure of irrigation water, supplied by the Water Users Associations (WUAs) in Armenia in 2021 and 2022, the breakdown was as follows: electricity costs (44.68%), salaries (19.57%), spring preparatory works and current expenditures (11.22%), water abstraction

fees (11.22%), and other expenditures (13.64%). The cost of the 1 m^3 of water supplied by WUAs in 2021 has composed 22.9 AMD/m^3, and introduction of the fee of 0.1 AMD/m^3 would constitute about 0.4% additional costs, while making an important shift in mentality and strengthening the application of the principle "beneficiary pays".

3.1.3. Summary

Currently, the state budget allocation to water policy, water resources management and protection, water resources monitoring and compliance assurance composes 780 mln AMD, which is about 20% more compared to the revenues generated from the water abstraction fees (651 mln AMD in 2021).

The optimal water policy, water resources management, monitoring and compliance assurance needs, calculated in the previous section of this report are not claimed to be an exhaustive and detailed assessment, but rather very rough assessment of the real needs, based on the consultations with the beneficiaries, previously existing reports and assessments, as well as analysis of the obligations undertaken by Armenia under the CEPA.

As the table below demonstrates, with the proposed reforms of the system of water abstraction fees, which should not cause significant socio-economic impact on the water use sectors, as well as farmers and household, it would be possible to cover the optimal needs for water policy, water resources management, monitoring and compliance assurance, and moreover still over 40% of the expected revenues from the water abstraction fees would remain. This amount could be used potentially used for implementation of selected measures from the program of measures of the RBMPs, aimed at strengthening of water resources monitoring, compliance assurance, legal and institutional improvement, providing as subsidies for implementation of specific technical measures to improve water use efficiency, or other needs, contributing to improvement of overall water resources management.

Table 9: Comparison of water policy, water resources management, monitoring and compliance assurance costs before and after the proposed reforms of water abstraction fees

Annual state budget allocation, mln AMD			Annual water abstraction fees, mln AMD		
Function	**Current allocation**	**Optimal needs**	**Sector**	**Current revenues from abstraction fees**	**Expected revenues from abstraction fees after reforms**
Water resources management and protection	155.5	239.5	Fisheries	441.5	925.5
			Technical	91.3	91.3
Water policy	18.3	36.6	Drinking	57.4	261.4

Annual state budget allocation, mln AMD			Annual water abstraction fees, mln AMD		
Function	**Current allocation**	**Optimal needs**	**Sector**	**Current revenues from abstraction fees**	**Expected revenues from abstraction fees after reforms**
Water resources monitoring	383.0	610.0	Irrigation	60.6	216.6
Compliance assurance	224.0	392.0	Hydropower	0	676.0
Total	780.8	**1278.1**	**Total**	650.8	**2170.8**

Source: Compiled from the analysis of figures presented in Chapter 2 of this Report

3.2. Water pollution taxes

The revenues from the water pollution taxes have increased 5-fold over the past 5 years. According to the Statistical Committee of Armenia, in 2017 the revenues from the water pollution taxes composed around 181 mln AMD, while in 2021 this figure was increased up to **942 mln AMD**, composing about 36.2% of the total environmental taxes in the country. Annex 2 provides detailed breakdown of the dynamics of revenues from water pollution taxes by marzes of Armenia over the period 2017-2021, as well as summary information on the contents of pollutants in wastewater for the same period.

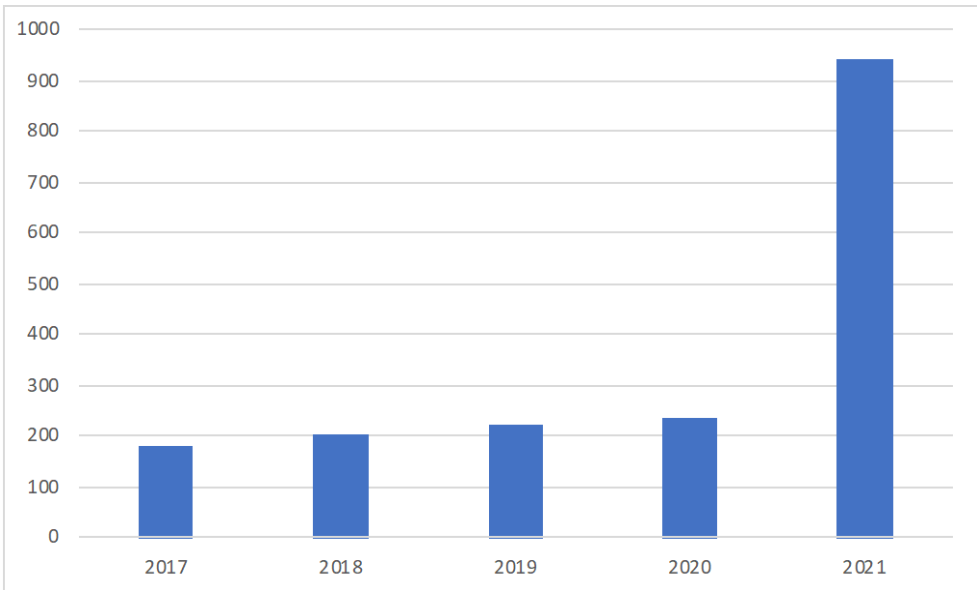


Figure 5: Dynamics of revenues from the environmental fees over the period of 2017-2021, mln AMD
Source: Compiled from data of the Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

Despite the significant progress achieved, the distribution of the collected water pollution taxes is not even, and as the table below shows, and over 90% of the taxes collected are attributed to Yerevan city.

Table 10: Breakdown of the revenues from water pollution taxes marzes of Armenia

Province	Water pollution, AMD	% of total
Yerevan city	855116.1	90.78
Aragatsotn	2950.3	0.31
Ararat	13941.5	1.48
Armavir	5689.1	0.60
Gegharkunik	3752.7	0.40
Lori	3511.5	0.37
Kotayk	15682.4	1.66
Shirak	7951.4	0.84
Syunik	22916.3	2.43
Vayotz Dzor	10267.1	1.09
Tavush	210.4	0.02

Source: Compiled from data of the Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

While throughout the country there are numerous water bodies at risk due to water quality, as shown in Chapter 1 of this report, including mining in industry in the Southern and Northern RBDs. However, it could be the case that certain companies, acting in different marzes of Armenia are officially registered in Yerevan, thus the 90% tax collection rate in Yerevan does not necessarily mean that the main pressure factors are in Yerevan.

Having said this, still the current system of water pollution taxes does not serve its objectives and should be completely revised. While revising the system of water pollution taxes, Article 77 of the Water Code of Armenia should be taken into consideration, which clearly states that the water pollution taxes should be defined based on the ecological status of the recipient water body. Also, Article 36.1 of the Water Code requires that if the surface water body has "high" or "good" status, then it is necessary to take measures to maintain such status.

Thus, in the new system, the approach of using MACs should be completely eliminated and the status of recipient water body should be critical in defining the water pollution tax. And to reiterate, the revenues from water pollution taxes should take into account the costs associated to implementation of the measures from the RBMPs, aimed at improving the qualitative status of water bodies at risk.

Having said this, it should be noted that according to the officially adopted 5 RBMPs and 1 draft RBMP, **annually** about **36.6 billion AMD** would be required to finance the measures for the water bodies at risk due to quality, and of course it should not be expected that the water pollution taxes (**942 mln AMD** collected in 2021) could cover these costs.

Moreover, there is extremely large difference between the costs of the measures aimed at improving water quality among the River Basin Districts (RBDs). Thus, in Southern RBD this cost is over 87,000 AMD per capita per year, or in Ararat RBD is over 48,000 AMD per capita per year, while in Sevan RBD the cost is less than 8,000 AMD per capita per year, and in Hrazdan RBD only about 20 AMD per capita per year. One of the reasons of such huge difference is that the first RBMPs (e.g. for Southern and Ararat RBD) that were officially adopted (2016-2017), contained over-ambitious program of measures, and envisaged construction of wastewater treatment facilities and sewerage network in all urban communities of the respective RBDs within the first planning cycle, whereas the recently adopted RBMPs (for Sevan and Hrazdan RBDs, 2022) took more realistic approach, and for some urban settlements the program of measures referred to conducting feasibility studies and preparation of designs documents for wastewater treatment, and only for priority ones the construction was envisaged. So, some balance should be found to address this issue, but again, one should not expect that the water pollution taxes in the short-term can cover all the costs of the measures related to improvement of qualitative status of water bodies, but rather should contribute to them. Before then, however, there is a need to revise the system of water pollution taxes, to make sure that the following is incorporated into the new system:

- carrying capacity of recipient body is critical, and the basis for defining the water pollution taxes should the ecological status of water body, which receives the wastewater;
- the list of pollutants subject to water pollution tax should be revised, to incorporate the pressure from all significant sources causing pressure (e.g. mining, and others);
- system of MACs should be excluded from the structure of the water pollution tax, given its evident drawbacks and a shift towards ecological status and surface water quality norms should be made.

4. PREREQUISITES FOR THE REFORM AND OPPORTUNITIES FOR EARMARKING

4.1. Earmarking as a tool to facilitate more efficient financial flows

In order for the proposed reforms to be efficient, corresponding accompanying measures need to be developed, such as exploring earmarking mechanisms, i.e. re-allocation of revenues from the water abstraction fees and water pollution taxes back to the water sector. Otherwise, the implementation of the proposed reforms will contribute to increase of the state budget, without a guarantee that it would be re-directed back to the water sector.

The overall aim of earmarking is to facilitate more efficient financial flows, and as a consequence enabling more efficient water management activities.

In many countries, the question whether revenues from water-related taxes should be earmarked for water expenditure has been explored in details. Earmarking can undermine overall economic efficiency, if earmarked resources could have been allocated to activities that create more value for the society. However, earmarking can secure funding, in particular in contexts when competition is fierce to access the public budget, and is thus gaining an increasing attention of water policy makers, as it would allow more efficient financial flows and, as a consequence, it would enable more efficient water management activities.

In Germany, water abstraction charges introduced since the end of the 1980s are collected by regional administrations and go usually to the state budgets, where they are usually earmarked (apart from the 2 of the 16 Federal States). Revenues are generally used for restoration and maintenance of surface water, protection of groundwater and the promotion of economical water use. This includes in some cases compensation for farmers using less fertilizer to support groundwater quality. In Lower Saxony, water related research projects in agriculture and forestry are also financed, as well as the renaturation of floodplains. In North Rhine-Westphalia, the revenues are used for the administration and for supporting the implementation of the Water Framework Directive.

In the Netherlands, the provinces are empowered to levy a groundwater charge, and the revenues are earmarked to provincial expenditures in the field of water resources.

Earmarking water pollution charges for covering the emerging costs (treatment, licensing, monitoring, enforcement) and for environmental investments is common in many European countries. Mostly the money remains therefore on the local level. In eastern European countries national environmental funds or foundations are often in place (e.g. Szech Republic, Slovak Republic, Estonia), which ensure the utilization of the money for environmental measures. In some

countries (e.g. Belgium, France and the Netherlands), the levies shall also provide funding sources for water-related investments. Also the idea to provide stronger incentives for reducing water pollution became more prominent in the last years and is foreseen for example by Australia and Hungary. Romania is also using earmarking mechanisms for the water pollution taxes.

To address diffuse pollution of water bodies, there are not many instruments in place which raise revenues (mainly subsidies and information instruments are used). However, some countries apply pesticide or fertilizer taxes. The goal is usually to produce positive environmental effects by reducing consumption and to raise revenues, mostly earmarked to support the agricultural sector or for environmental projects, often focusing on soil and groundwater protection.

Another example is China, where the hydropower fees earmarked for watershed protection.

4.2. Challenges and opportunities for introduction of earmarking mechanism in Armenia

Article 17 of the Republic of Armenia Law **"On Budgetary System"** (1997 and its further amendments) defines that water abstraction fees and water pollution taxes are part of the state budget income and should be directed to the state budget.

On the other hand, the need for earmarking mechanisms or targeting the water abstraction fee and pollution taxes are clearly mentioned in Chapter 1 (General provisions) of the Republic of Armenia law "On Fundamental Provisions of the National Water Policy" and Chapter 8 (Implementation of the National Water Program) of the Republic of Armenia law "On National Water Program". Thus, **Article 6 of the law "On Fundamental Provisions of the National Water Policy"** (National Water Policy Principles) defines that the sustainable water resources management shall be provided by applying the following principle: "Targeting of fees collected as a result of water resources use, and disposal of harmful substances and compounds to the water basin at activities supporting sustainable water resources management, including, assuring an appropriate financial basis for implementation of the National Water Program and handling current environmental problems in the sector".

Article 56 of the law "On National Water Program" (Economic Mechanisms) requires the following: "(1) Within a short-term period, the state authorized bodies in the water sector perform a medium and long-term cost estimates for the management of water resources and assessment of alternative funding mechanisms for those expenditures. These alternative mechanisms shall cover detailed recommendations on the improvement of the system of fees for the current withdrawal and pollution, relating to water resources monitoring, water use permitting and compliance assurance, reimbursement of the costs for the improvement of the data management systems and procedures, through the State Water Cadastre; (2) Targeted application of nature use

and environmental fees for the development of the sector shall gradually become one of the financial sources of the sector, which shall be inscribed in the acting law and the legal acts to be adopted in future".

Despite these discrepancies between the Republic of Armenia laws "On Budgetary Systems", "On Fundamental Provisions of the National Water Policy" and "On National Water Program" there is already one earmarking mechanisms in the environmental sector of Armenia.

This only existing earmarking mechanism in the environmental sector was established in 2001 through the Republic of Armenia law "On Targeted Use of Environmental Payments by Companies". Such law laid a foundation for earmarking of revenues generated from environmental payments made by large-scale industrial companies (18 companies) to be re-directed for implementing environmental projects by the communities where the companies are located. A precondition of having funds allocated from these revenues is submission of acceptable environmental project proposals by eligible communities.

Naturally, water-related projects are also among the acceptable environmental projects, including the following:

- Actions and activities targeted towards wastewater treatment, sewerage system management, construction, operation and improvement;
- Combating against local and regional environmental pollution, including surface and groundwater resources protection, clean-up of the water resources protection zones and their adjacent ecosystems.

This mechanism, however, has been subject to several problems. Firstly, it only applies to pollution charges but not to natural resource charges (including water abstraction charges), which is questionable given that mining companies pay more charges for natural resources use than for environmental pollution. Secondly, the local communities are institutionally weak and need help in developing proposals and implementing projects. Thirdly, money collected from these 18 companies' charge payments is not kept on a separate account, but goes into the general budget and is forfeited at the end of a fiscal year for other purposes. Given that the total revenue is not high, it would be more useful to accumulate the funds over several years to finance a larger environmental project.

Finally, the inexistence of an environmental fund is frequently states as reason for the non-acceptance of higher charge rates by industry. Furthermore, for the Ministry of Environment might not consider it worthy to increase charge rates as long as related revenues are not earmarked for environmental purposes.

Summarizing the above-mentioned analysis, it could be stated that in Armenia there is a weak link between charge revenues and financing environmental measures. Despite the legal definition of

environmental charges as having the purpose of creating revenues in order to carry out environmental measures, there are no environmental funds in Armenia. Part of the reason for this may be the external pressure on government from the International Monetary Fund (IMF) against extra-budgetary funds or other types of earmarking (including environmental funds). In 2004 draft law "On National Environmental Fund" has been prepared and circulated by the Ministry of Nature Protection, which however did not succeed with formal adoption by the Parliament. In the absence of an environmental fund, there is no linkage between the budget resources spent on environmental issues and the environmental revenues generated.

4.3. Prerequisites of the proposed reforms

As the analysis of this chapter demonstrates, the main prerequisite for the proposed reforms of water abstraction fees and water pollution taxes is earmarking (in a budget law) of a certain percentage back to the water sector. This would decrease the risk of water-related revenues being diverted for non-water expenditure. Earmarking a share of the budget revenue for water expenditure would also provide tighter control over spending.

However, this scenario is open to the possibility that the percentage of earmarked revenues would be subject to political lobbying and not be based on water-related needs. Presently, the earmarking option is likely to face resistance in the government. There might be strong opposition from the Ministry of Finance against fragmentation of budget revenues. However, as the analysis in Chapter 2 of this report demonstrates already today the state budget funding allocated for water resources management, water policy, water resources monitoring and compliance assurance exceeds by about 20% the total revenues collected from water abstraction fees. Thus, in 2021 about 650 mln AMD was collected from water abstraction fees, while the state budget allocations to water resources management, water policy, water resources monitoring and compliance assurance has composed about 780 mln AMD.

Thus, the main pre-requisite for the proposed reforms in water abstraction fees and water pollution taxes relates to adjustment of Article 17 of the Republic of Armenia Law "On Budgetary Systems" and fixing the percentage that is earmarked to the water sector. Article 6 of the law "On Fundamental Provisions of the National Water Policy" and Article 56 of the law "On National Water Program" should be used in this proposes, to support the proposed adjustments. This will make it possible to re-allocate revenues from the water abstraction fees and water pollution taxes back to water sector, thus facilitating more efficient financial flows, and as a consequence enabling more efficient water management activities in Armenia.

Particularly, for water abstraction fees, in case a consensus is reached that all revenues are earmarked back to the water sector, it would cover the "optimal" water management and monitoring costs. In addition to that, about 40% of the revenues from the abstraction fees would remain, which could be used for implementation of selected measures from the Program of

Measures of the RBMPs, aimed at strengthening of water resources monitoring, compliance assurance, legal and institutional improvement, providing as subsidies for implementation of specific technical measures to improve water use efficiency, or other needs, contributing to improvement of overall water resources management.

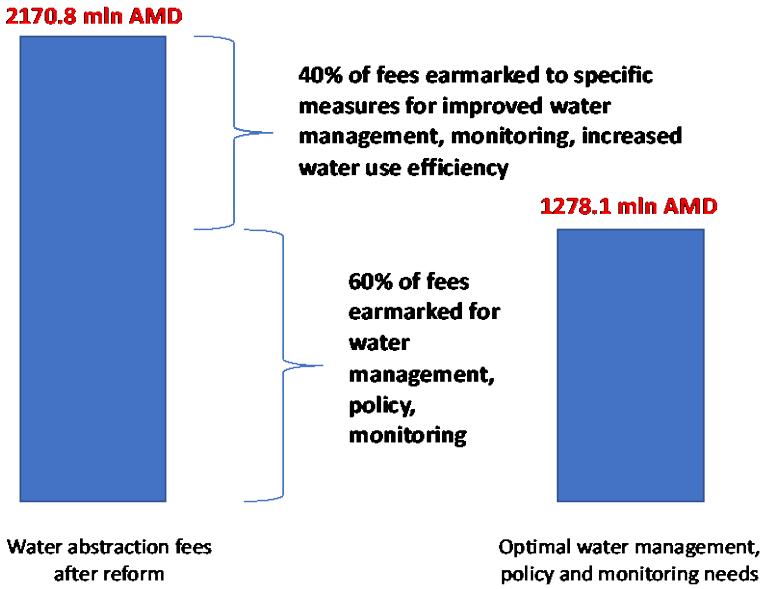


Figure 6: Proposed Scenario 1 of earmarking water abstraction fees back to the water sector

In the less desirable Scenario 2, the adjustment of Article 17 of the Republic of Armenia Law "On Budgetary Systems" could fix the certain percentage of water abstraction fees are earmarked back to the water sector, which are enough to cover the optimal water management, policy and monitoring costs. While in this report this figures is very roughly assessed (60% of revenues from the fees after the implementation of the proposed reforms) more detailed and accurate assessment would be required: (a) to define the optimal water management, policy and monitoring needs, and (b) expected revenues after the reforms.

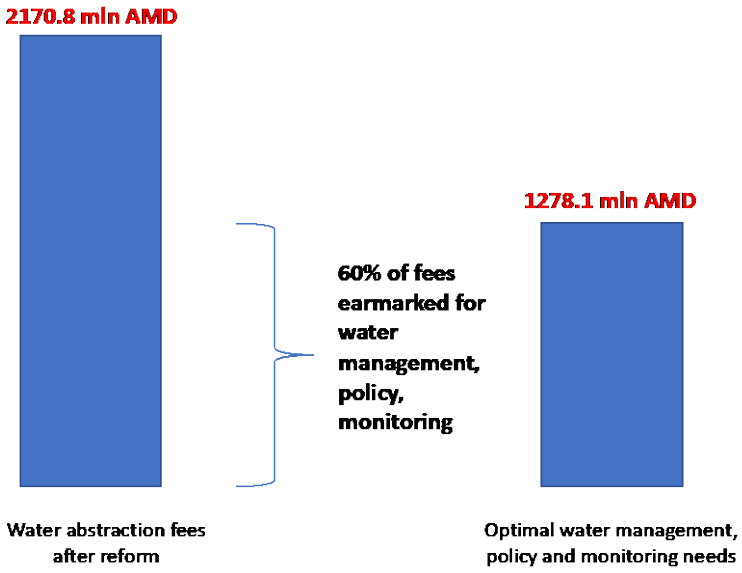


Figure 7: Proposed Scenario 2 of earmarking water abstraction fees back to the water sector

CONCLUSION

Very low charge levels for water abstraction and pollution, as well as the unfair distribution of charges among users' groups, reveal a poor application of the "user pays" and "polluter pays" principles, despite the fact that these principles are one of the pillars of the current water-related Armenian legislation, and are also in line with the EU WFD, to which currently Armenia approximates. Undertaking reforms in the system of water abstraction fees and water pollution charges in Armenia, thus becomes prerogative, which could generate significant opportunities to improve financing of water sector, to contribute to more rational and efficient use of water resources, to prevent or reduce pollution of water bodies and eventually help to achieve good ecological status for water bodies, as required by the EU WFD.

While the process of reforms creates good opportunities for improved water management, there are certain challenges, which require careful attention of policy makers. Thus, careful attention should be paid for defining the short-, medium- and long-term objectives of reforming the water abstraction and pollution fees - something that the current system lacks. And while for the water abstraction fees the proposed short-term objective is relatively clear (revenues from water abstraction fees must be sufficient to cover all expenses involved in proper management of water resources, water policy implementation, water resources monitoring, and compliance assurance with water use permit conditions), for defining the short-term objectives of the water pollution taxes (revenues from water pollution taxes should take into account the costs associated to implementation of the measure from the RBMPs aimed at improving the qualitative status of water bodies at risk due to water quality) more active involvement of the Ministry of Environment would be required. This particularly relates to more accurate definition of the extent, to which the costs of measures for improved water quality should be covered by the water pollution taxes.

Also, more accurate assessment of the optimal water management, water policy, water resources monitoring and compliance assurance needs should be undertaken, based on more in-depth institutional review, particularly in line with the Armenia's obligations under the 5 water-related Directives within the CEPA.

This reports has provided very rough assessments on some of these items, but as such it mainly aims to facilitate policy discussion on the opportunities and pre-requisites for reforming water abstraction fees in Armenia, and to serve as an input for development of road map for reforms.

One of the key recommendations of the report relates to the need to corresponding accompanying measures, and particularly exploring the possibility of application of earmarking mechanisms, in order to reallocate the revenues from water abstraction fees and water pollution taxes back to the water sector. Without clear earmarking mechanism the proposed reforms will not be efficient and the more efficient water management activities would be questionable.

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ANNEXES

Annex 1: Summary information on water abstraction fees

Revenues from water abstraction fees, thousand AMD

Marz	2017	2018	2019	2020	2021
Yerevan city	78271.1	87577.2	91641.7	101646.8	161351.3
Aragatsotn	5830.5	2106.1	8136.8	3028.4	2078.4
Ararat	206840.2	244283.0	280742.9	349729.7	352839.3
Armavir	57454.7	59982.3	64932.0	66925.6	60181.9
Gegharkunik	1693.5	3912.9	4679.4	3622.1	3900.7
Lori	6842.2	4375.5	8632.1	3216.4	3439.3
Kotayk	3186.5	3191.9	3367.4	3578.6	4674.1
Shirak	693.5	1500.2	4125.3	4513.4	4702.4
Syunik	38948.4	45770.1	49491.8	55530.3	56423.4
Vayots Dzor	825.8	751.4	735.8	806.4	679.2
Tavush	496.1	346.9	396.2	409.3	453.6
	401082.5	453797.5	516881.4	593007.0	650723.6

Source: Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

Annex 2: Summary information on water pollutation taxes

Revenues from water pollution taxes, thousand AMD

Marz	2017	2018	2019	2020	2021
Yerevan city	112081.4	132701.7	154520.8	160952.7	855116.1
Aragatsotn	2650.7	2058.5	2274.5	2651.1	2950.3
Ararat	9676.1	11051.6	12579.6	15148.9	13941.5
Armavir	4719.2	4629.7	4532.5	5252.5	5689.1
Gegharkunik	4121.9	7785.9	4569.5	4259.6	3752.7
Lori	7649.8	5020.8	3791.8	3542.3	3511.5
Kotayk	6862.0	11422.8	14590.5	15192.1	15682.4
Shirak	4649.9	5982.6	7044.7	8154.7	7951.4
Syunik	24276.8	17448.5	15572.1	17276.1	22916.3
Vayots Dzor	4200.4	4923.0	4827.2	4803.7	10267.1
Tavush	111.5	269.8	240.7	235.2	210.4
	180999.7	203294.9	224543.9	237468.9	941988.8

Source: Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)

Contents of pollutants in wastewater, 2017-2021

	2017	2018	2019	2020	2021
BOD5, t	16 719.7	9 057.3	9 722.7	8 745.8	9 237.7
COD, t	42 028.7	16 022.1	17 773.4	16 652.4	16 018.0
Nitrogen ammonia, t	2 495.0	1 283.8	1 720.9	1 957.7	1 736.7
Salts total, kg	4 424.5	64 490.0	-	-	-
Aluminium, kg	-	-	-	2.3	0.4
Arsenic, kg	227.0	52.9	27.7	36.3	73.1
Bromine, kg	-	0.0	0.0	-	-
Detergents (washing chemical agents), kg	5 898.5	1 121.3	843.6	712.3	1 823.9
Iron, kg	4 360.7	3 407.2	335.2	2 118.3	2 801.3
Total phosphorus, t	78.6	6.4	35.4	4.6	2.5
Cadmium, kg	-	-	-	18.0	-
Calcium, t	312.3	253.5	60.3	1 174.5	4 709.7
Suspended solids, t	6 773.7	19 467.2	14 035.1	14 118.4	13 824.5
Lead, kg	0.0	0.0	-	-	-
Cobalt, kg	43.6	0.0	-	-	-
Magnesium, kg	314.6	155.7	130.3	162.5	110 523.6
Manganese, kg	628.0	2 043.1	2.7	2 788.2	1 281.9
Molybdenum, kg	4 915.0	13 590.0	-	18 032.0	19 211.1
Petroleum products, t	112.4	89.8	41.3	36.5	33.8
Sodium, kg	1.8	0.0	-	-	-
Nitrates, t	811.9	857.1	849.8	750.0	607.8
Nitrites, t	44.7	275.6	26.5	21.6	24.7
Copper, kg	3 602.3	443.0	254.5	899.2	450.7
Sulphates, t	31 086.4	23 348.4	19 119.2	24 733.9	34 015.8
Zinc, kg	260.3	617.7	130.2	35.7	565.1
Chlorides, t	22 483.2	12 932.5	19 830.4	14 393.1	15 836.4
Chromium, kg	0.0	0.0	-	-	-
Oxyethylidendiophosphonic acid, kg	3.2	2.0	2.3	-	-
Phosphate, kg	2.9	1.8	83.2	3.4	2.9
Fluorides, kg	2.0	-	0.0	0.0	0.0
Surfactants, kg	0.1	-	-	-	-
Oil particles, kg	1 007.2	-	-	-	-
Nickel, kg	0.0	-	-	-	-

Source: Statistical Committee of Armenia, "Environment and Natural Resources in the Republic of Armenia for 2021" (2022)