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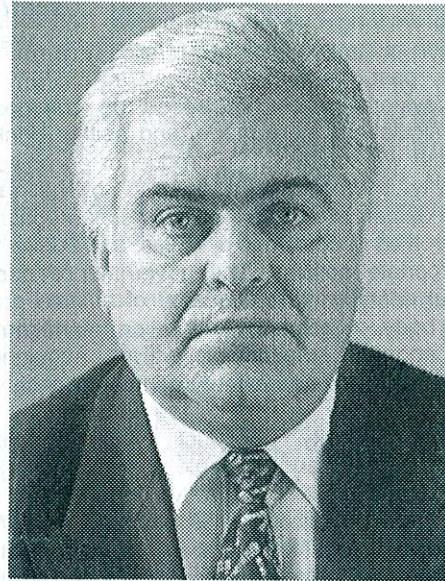
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ARMENIA'S WATER RESOURCES MANAGEMENT: CURRENT SITUATION AND FUTURE PROSPECTS

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Armenia is a country with scant land and water resources. Per capita annual supply of water in the republic is 2600 cubic meters, which is 6-7 times lower than the average level of the former states of the USSR. Surface water flow is distributed rather unevenly in terms of both time and locality. This water deficiency has a crucial impact on the country's climate, the irrigated land areas, and other related fields. According to available data, the average annual amount of precipitation in Armenia amounts to 17-18 billion cubic meters per year. The confluence of borderland rivers stands at the same level, and our share is 900 million cubic meters. Evaporation involves 11.5 billion cubic meters. Inland river flow is equal to some 6.3 billion cubic meters. Restored resources of surface waters amount to 7.2 billion cubic meters annually, of which nearly 2.5 billion cubic meters are used against 4.5 billion cubic meters in the past. Lake Sevan is one of the key suppliers of water with its 1230 square kilometer surface and its volume of 33.2 billion cubic meters. Among the larger rivers, the main role is played by the Arax, which provides 2.7 billion cubic meters per annum, the Debet (1.2 billion cubic meters), the Vorotan and the Arpa, each annually supplying 700 million cubic meters and the Aghstev with an annual flow of 290 million cubic meters.



As in the overwhelming majority of countries in the world, the lack of a comprehensive general approach towards water in Armenia resulted in widely scattered and disorderly water management. Responsibilities, exploitation, and maintenance of resource management systems, reservoirs, canals, pipelines, sewers, pump stations, sewage plants, construction and operation of sewage systems, are distributed among several administrative subdivisions. It is so unclear and unfounded, that there basically does not exist any water sphere in Armenia as such. Hence, water management is lost among the interests of the many administrative divisions.

Due to the limited nature of water resources and the fact that their utilization must be systematized and effective (even more so when the world considers the 21st century to be the century of water) the solutions to these problems need to be coordinated. Working out and implementing the programs gave rise to serious difficulties -- especially during the past few years -- for governments and donors in the present structures and conditions. Thus, based on the above, the state's governing body requested that the government examine possible solutions to these problems.

The process was initiated in September 2000. Decree # 92 of February 2001 stipulated the establishment of a Water Management Administration as a State Committee answerable to the government. The terms of reference of the given committee cover the implementation of tasks dealing

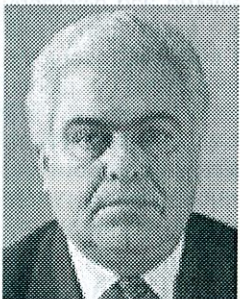
with the management of water as a resource and its utilization. This decree saw the assignation of appropriate specialists to work out the programs for the years 2001-2005 and 2010, with the assistance of the World Bank. On May 5, the government discussed, and today it has ratified, a program providing for arrangements aimed at using funds from 2001 to 2005 for improving the activity and management of structures in Armenia's water management system. The program mainly aims at securing the effective and safe operation of the system, its regular development, as well as the improvement of the current situation with a view to ensure the natural development for the purpose of solving internal, communal, and interstate problems.

Prior to working out the program, the actual situation of the whole system was studied. In the past, the irrigation and drinking water systems were not based on commercial principles. No calculations were made, and neither drinking nor irrigation water was treated as a product or an object of commercial activity. The policy pursued up to now has failed to draw a rigid demarcation line between state regulatory bodies; those involved in economic activities, and bodies that implement appropriate policies. The government's decree gives a clear-cut definition to the motion of a state policy implementation body, a resource utilization management body, and one engaged in economic activity. Acquiring a corresponding status in the nearest future in compliance with a government decree, the Ministry of the Environment will pursue economic activity, conduct water cadaster management, fix quotas, and instigate the monitoring of primary water consumers. A body independent of government will deal with licensing issues and implement tariffs. Circles within the jurisdiction of the committee must be responsible to guarantee water supply to society and industry through the state's administration, and the general utilization and management of water resources. There is an investment program worth some 200 million USD. It has been worked out

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for the next ten years, and more clearly defined for the next five years. A week ago, a document stipulating the first program equal to 57 million DEM was signed with the German government. The second irrigation program worth 31-32 million USD* is to be signed with the World Bank on June 10-15, and one more agreement will be signed with the WB in September. This will provide for 25 million USD to be directed to drinking water for other populated areas of Armenia. The minimum investment program for 2001-2005 for drinking and irrigation water, purification stations, and reservoirs is about 200 million USD.

The poor quality of service, the inadequate state of calculating and collecting water payments, the high rate of water losses, the inadequate utilization of gravity-flow water supply, all resulted in a critical situation in technical and financial areas of the water supply systems. The "Irrigation" and the "Armenian Water Pipe and Sewage" companies alone accumulated (as of 2001 01 01) a debt of nearly 27 billion AMD: for salaries, social security payments, electricity, and other supplies. Debt to the state budget amounts to 15 billion AMD, nearly 3.5 times more than the annual estimated incomes of those companies, and 7.5 times more than their real incomes. We may pay off all debts if we accumulate incomes over the next 7.5 years and freeze all expenses. We know, however, that we will always have to operate, pay wages, and so forth. With the aim of finding a break-through out of this situation, an agenda was prepared. The government discussed this program for 2.5 months before finally ratifying it. The program puts a high priority on the complete transfer of the activities dealing with drinking and irrigation waters to commercial principles. It also seeks to shift the relationship of both suppliers and employees onto a business plane, drawing a parallel with social issues. Another rather important task is the working out and implementation of water-consuming conglomerates and joint ownerships. Unfortunately, today we are facing a wasteland in buyer-



Gagik Martirosyan was born on 1951 01 14, in Gladzor, Yeghegnazor Region. In 1968, he graduated from Yeghegnazor high school to enter the Construction Faculty of the Polytechnic Institute. After graduating from the institute in 1974, he worked at the Yeghegnazor Mobile Mechanized Column at Jermukshintrest of the Ministry of Construction of the Armenian Soviet Socialist Republic (ASSR). He worked here till 1979. From 1979 to 1980, he worked as Head of the Organization Department, and then as Deputy Chairman of the Executive Committee in the Yeghegnazor District Council. In the years 1980-1986, he was the Jermukshintrest manager and in 1986-1987 he was manager of Trust #14 of the ASSR Ministry of Construction. He was then appointed Head of the Department of Industry and Construction Works in the ASSR Ministry of Construction. In 1987-1988, he was the manager of the Armenian Industrial Construction Trust in the ASSR Ministry of Industrial

Construction. From 1988 to 1990, Mr. Martirosyan worked as assistant to the Head of the Central Technology Department of the Constructional Industry and as the first deputy chairman of the ASSR State Construction Department. In 1990, he was elected to of Armenia's National Assembly. He resigned his membership to work in Armenia's Ministry of Construction. From 1990-1993, he was Armenia's Minister of Construction. In 1993-1995, he was Armenia's State Minister and in 1995-1998, was the Minister of Energy. In 1998-1999, he was appointed Minister for the Organization of Industrial Infrastructures in Armenia. From 1999 to 2001, he worked as Advisor to the Prime Minister and Head of the Central Department on Systemization and the Supervision of Credits, Grants and Humanitarian Aid in the Armenian Government apparatus. Since 2000 02 12, he is Advisor to the Prime Minister and Chairman of the State Committee of the Water Management Administration. He is married and has 2 children.

seller relations, as the law on joint-ownerships in Armenia (adopted in 1995), which sought to grant some 30 million square meters of populated territory to the proprietors of joint ownerships, was inefficient. This was because the method of organizing joint ownerships was a dead letter. Investments must serve the stakeholders of the program. The primary ideological principle is the actual value, and final separation, of the parties implementing state policy and economic activity of the three bodies functioning in water resource management.

The involvement of the private sector in management is considered the motivating force of the program. Considering that privatization of the state water system is not realistic (at least in the next ten years), the privatization of the system's management is practical within the next year. The Ministry of Finance, jointly with the World Bank and our state committee employees, will use grants to work out the criteria for the private management of state property. Private companies will be chosen, on a competitive basis, to manage state property. Certainly, a key to success here is the introduction of a system to formulate clear-cut mechanisms, the absence of which hinders implementation of goals.

The regulation within the legislative field and the basic norms are other issues of utmost importance. An area as important as this one lacks a standard, legal, regulatory field. Armenia's water code, adopted in 1992, fails to offer a solution to any of the current problems, yet it was not followed by the approval of the three or four significant laws that referred to the supply of drinking and irrigation water. Nor was any provision made to establish the legal relationships involved. The conceptual framework was not codified, while the adoption of the law on joint ownership did not introduce any fundamental solutions to the issues under question. Offices and maintenance shops were liquidated with no substitutes planned. Water goes through the state water mains system till the threshold of a dwelling. At this point, the state ends its responsibilities by handing them over to communities that may be improperly established within villages and districts. These incompletely formed communities are in charge the moment water reaches the entrance of a five-to ten-story building. Thus, directors of state joint-stock companies, who carry no responsibility for the success or failure for the fulfillment of their task, deal with another joint-stock company or a joint ownership that is not only incompletely formed, but does not even bear responsibility for the property's drinking and irrigation water systems. In accordance with our current law, the final "haven" for the settlement of legal-contractual relationships is the court. Even in the case of a prior court decision, joint ownerships and groups of water consumers cannot be called to account in any way. Today, it is not realistic at all to institute mass legal proceedings against any dwelling, or a city. We would merely foment social unrest.

There is a serious program aimed at upgrading the safety and operational efficiency of the Arpa-Sevan tunnel and hydroelectric power structures, as well as the state's 82 water reservoirs. The Arpa-Sevan tunnel has been functioning since 1980 and in the course of those twenty years, it has moved nearly five billion cubic meters of water

from the river to the lake. Meanwhile, it managed to receive no more than four million USD from our state budget. The construction, worth 150 million USD, should have received no less than 20 million USD, based on minimum amortization calculations. Today, we face an extremely difficult financial

and technical situation. The program tries to solve the problems of the unfinished hydrotechnical construction on the Vorotan, started nineteen years ago. It addresses the problem of the reservoirs: though their construction began ten years ago, they still remain unfinished. The list of unfinished construction includes the Yeghvard reservoir, which, of course, will not be constructed according to the old dimensions. This means that its capacity will be 100

million cubic meters rather than 300 million cubic meters. The reservoir will allow us to decrease output from Lake Sevan.

An Italian firm deals with management in Yerevan. Of course, it is expedient for us to have a similar management method for the irrigation systems of Lorree, Vanadzor, as well as other populated areas. Firstly, the adaptation of foreign firms in Armenia is a difficult process. Secondly, it is an exorbitant pleasure. Unlike the Yerevan program, the above-mentioned program offers the following approach. We obtain no credits to hire an operator, but our operator himself makes a profit by means of a license and a pledge. Criteria will be fixed. There will be a tender without restrictions. Any firm, willing to participate, is to make a deposit proportionate to the problem at hand and make a profit.

The programs are divided according to a schedule. The May-June 2001 program seeks to settle the problems related to management reform. Organizational work is planned for the year 2002. We will regulate the norms to be used, announce pertinent contract bids, and close the projects of the first, second, and third stages that spill over to the second half of 2002. The program gives a high priority to Armenia's water code and works out issues arising from the given codes on drinking and irrigation water. The National Assembly deputies and some scientists took the initiative to establish a task force, in which both government officials and employees participate. We expect to complete the legislative field by the end of this year.

The program granted us a term of one more year (till 2002) for the regulation of the norms. I think it won't be a surprise for you, if I say that alien standards function in our country. Exploitation norms must be changed and made stricter. If a certain operation requires eight persons working in shifts, we sometimes can only afford four or even one person to do the job – justifying this by pointing to the lack of means.

For instance, prior to starting seasonal work on the Arpa-Sevan tunnel or any other large canal, an initial investigation must be conducted, permission for work must be received, and after six months or even three months, a progress report must be submitted. All our reservoirs lack the necessary seismic equipment to warn us of impending disasters. On 1994 05 30, a small lake in Arteek collapsed. Although we have reservoirs 100 times bigger than this one, we incurred losses of several billions drams. If we fail to face the issue of reservoirs and large hydrotechnical constructions, we will face serious problems. Directors,

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however, are unable to settle these issues on the basis of their authority or that of their superiors. There should be no vertical relations in management problems. They must be substituted by horizontal, contractual relationships according to any given problem. If an operator fails in his responsibilities, he pays. If he manages it properly, he receives a profit. We should stop appointing someone to a position and then soon dismiss him, since it hurts nature, society, and the budget. Investment programs were mainly discussed with specialists of the World Bank. Distinctions are introduced according to the operational years. Programs dealing with irrigation, drinking water, and reservoirs were discussed with the German Government and the Development Bank. The President and the Government of Armenia asked for the elaboration of schedules. Ultimately our ability to simultaneously implement various branches of this comprehensive program (dealing with the construction, organizational, legislative, financial, and technical aspects) will be the proof of our success. If one of these programs goes ahead of the other or lags behind, it can have no positive result. It is noteworthy that a country's given system, considered independently of the others, cannot be fully and completely rehabilitated.

As compared with other programs, this one has its advantages, since market problems are not opposed to social ones. A firm target aims at the systems that can be more accurately defined and calculated based on permits, plots of land under irrigation, and corresponding technical standards by means of grants. All the above cannot come to their logical end, unless there are corresponding infrastructures to store, transport, preserve, and sell agricultural products in rural communities. Today, they are obviously hindering the process of collecting payments for water supplies. Today fertilizers and other chemicals sold to villagers are very often of poor quality. Villagers fail to sell their harvest or they do not get paid for their work. There are no insurance organizations, and land is not regarded as collateral.

Within these five years of the transitional period, the government has been addressing the needs of its other infrastructures.

Serious evaluation and inventory work needs to be done. Based on calculations and international criteria, current fixed funds are to be some 1.5 billion USD, excluding depreciation. Meanwhile, the sum of fifty million USD is present in our balance of payments. The same problems are present in reevaluating our inventory, as well as in the issues of our debt-receivable and payable. There are many addressed and un-addressed debts in the receivables and payments. A two-year period is provided to find appropriate solutions to these problems.

The program states that currently existing debts payable are 25-27 billion AMD. At present, the calculation process for the potable water system is beyond any logic.

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Based on the 1989 population census, the population figure is multiplied by the volume of per capita water consumption according to 1966 Soviet norms. The resulting amount is multiplied by 50 AMD, and thus, income is received. Yet nobody succeeds in establishing the accuracy of the process, the quantity of the population, and the per capita water consumption. The whole world solves this problem by means of measurement. The quantity of water consumed must be measured. It is quite a different matter if a consumer is unable to pay for this water. Today, he asks us three questions, and we fail to answer two of them. The consumer may claim that he did not drink. We cannot find out whether he drank or not. After a time, he says that he did not drink as much as he is required to pay for. Thus, we fail to hold proper negotiations with our subjects. This 20% calculation in fact makes up only 8-9%. By the end of 2005 we are to reach 85%, and 100% soon thereafter, via self-financing. The given program stipulates the mark-up. Today, water receives some 1 billion 200 million AMD from the state in the form of subsidies. Meanwhile, the implementation of the program will enable this sphere to be self-supporting, not to receive any state subsidies, and make regular tax and other resource payments.

The irrigation system presently manages to collect 37% of its receivables, providing 15% self-financing. In 2005, this system will become 100% self-supporting. If the irrigation system manages to provide an 85% payment rate and decrease its losses, a rather big percentage of the systems may be converted to function by gravity flow, annually saving 150 million cubic meters or nearly 2,5 billion AMD, in the potable and irrigation water systems. The overwhelming majority of the country's populated areas are gradually passing to a twenty-four-hour water supply, providing both high quality and uninterrupted supplies. We object to the idea of receiving a subsidy from the budget of state organizations. Instead of granting subsidies, the state will provide a transfer to a citizen, who is unable to make full payments, as fixed by the state tariff. The citizen will pay one part of the sum, and will get the state's compensation for the remaining share. Meanwhile, today the state provides five billion AMD for irrigation systems. The population collects one billion AMD. The five billion AMD figure is incomprehensible for the population. When paying its one billion, it constantly complains to the state.

A crucial role in this issue is played by the transparent work to be conducted with the population. At each term, the government, mass media, the World Bank, and counseling organizations will be provided with transparent information, based on the work to be conducted and the one completed. I have presented you the rough picture of the program adopted by the government, and we will try to implement it.

QUESTIONS AND ANSWERS

-What are the future prospects for the privatization or denationalization of construction projects in this area?

-Privatization of this area is far from being realistic in the course of the next ten years. The government has not yet accepted the idea to privatize

these structures. They may always remain state-owned. But it was certainly accepted that their management must be privatized. The organization of the system should not be pursued by means of the state but rather through the private sector. This process is to start at the end of this year; its completion is planned for the end of 2003. It will take six months to work out the documents and announce the date of the tender. The process will be fully engaged starting from 2002. In the last quarter of this year we want to implement a program in both irrigation and drinking water systems.

-What is your view concerning the proposal to privatize mineral water springs and wells.

-My view is negative. However, I think that it is quite normal that firms or owners manage the exploitation of their mineral water wells. Everything must be transparent, measured, and defined. Documents must be accessible for either the tax or standardization bodies. There are many known cases today; when 10 liters of mineral water are used in 100 bottles -- or vice versa, 100 liters are extracted from a well and 3 liters are injected in their place. I am of the opinion that all these figures must be registered for all to see.

-What is the role played by science in the present program? Does a regulatory link exist?

-The overwhelming majority of problems in the program are based on scientific approaches or certain technical projects. A high priority is attached to science. I believe that, as a rule, science should occupy an important position in any sphere. The most well-grounded investment is the one made in science. Science could be divided into two parts. The state management body, which presently includes the Ministry of Environmental Protection, will become a separate, independent body soon. The technical and scientific aspects must be placed in this section.

-Don't you think that the Water Resource Management body to be established in the future must have a higher status in government than that of the Water Economy Committee?

-Yes, I believe so even today. While Minister of Energy in 1995, I wrote that the spheres of water, heating, and energy must develop simultaneously. The deficient development of one of them will make it lag behind the other. I think that this body had to be formed at that time, and the program, adopted by us only now, should have been adopted in 1996. Under these conditions, today, we could have been in a different situation. It would have been unnecessary for us to maintain our committee today. If those two bodies were formed then, they could now be found as a Ministry. We have seven resources and there should be long-term state programs and national approaches for them. Our system must be gradually privatized.

-Would you elaborate on the demarcation line between market and social issues?

-I mentioned that today, a subsidy is granted to our institutions, and the latter provide the population with water, but only half-heartedly. In this case the state gives transfers to citizens, military units, schools, and they demand water from us. They pay and say "bring water to our house". Maybe, the state is investing more money today than it will do in the future, because someone is always leaving his tap on, and water is wasted, while at the same time, another person has no water at all. We will install social and market meters. The water of the first floor will reach the top floors and everyone will pay as much as s/he uses according to a formal statement of water consumed. If a person's funds are not enough to pay for the consumed water, the state will cover the difference.

-Does the department face any regional problems in the co-operation with neighboring countries? What do you think of potable water exports to the Middle East? Are there any proposals?

-I cannot elaborate on the mechanisms, since we have to define how water is exported, by pipelines or tankers, as well as the funds involved. It is, undoubtedly, a realistic fact that we have enormous resources, but they are callously wasted. We need to upgrade their management and make them a source of national income. We signed an interstate document in Germany on 2001 05 10. It provides for 15 million DEM, granted to three states for the implementation of joint programs on corresponding infrastructures. I have shown there that water goes from Armenia to Georgia and from Armenia to Azerbaijan, Turkey, and Persia. Not a single liter of water comes to our country from those states. Hence, the main and pivotal factor of the program must be based in Armenia. Proper attention should also be paid to the fact that agricultural, household, and communal waste sewage from Vanadzor, Eedjevan, and Ararat is sent outside the country for purification. This process requires investments. We should not be the only ones responsible for the repayment of those credits and grants, responsibility should also rest on those for whom we purify water.

-What is the current state of the drinking water network? What are the losses and how much does the state lose?

-As far as I know, the level of these losses in Yerevan is 60%. In the other populated areas of Armenia, the figure ranges from 55% to 70%. The estimated revenue of the given sphere amounts to 11 billion AMD. Last year, only two billion AMD were collected. The loss, therefore is 9 billion AMD. The state compensated for 1 billion AMD. A figure of eight billion AMD is another loss in the form of depreciated pipelines and unpaid salaries, amongst others. In one

year, there was a 30% increase in accidents. Only two of the country's eighteen purification plants are mechanically viable. None are biologically viable. The oxygen problem is 80% solved and the remaining 20% are settled in a formal way.

-What is your evaluation of the activities of the Italian organization "A Utility"? Have they failed to provide proper management?

-I've met with the administration of this organization on three occasions. We have had discussions and I know of their work. It is an experienced organization. The first-year term expires in June 2001. I believe that the work they do is done properly, and I am sure that they will be successful. Yet it is also important for the Armenian party to organize its activities properly. Finally, there are technical, and financial indicators listed by year. They must be improved by 85% by the fourth year of their management. As Advisor to the Prime Minister, I consider their work to be within norms and good. I am sure that with the parties' mutually complementary work, we won't have to wait long for success.

-What is the functional relationship between your state committee and the Resources Department of the Ministry of Environmental Protection?

-Both our functions are well defined. We do not intrude into each other's spheres either in practice or administratively. Within these three months of our activity there has been no clash of interests or any unsettled issue. This favorable situation is conditioned by the fact that in February 2001 the government worked out a clear-cut functional definition of our two systems. It is impossible to work without that under these conditions.

-What is your viewpoint concerning the law on Lake Sevan?

-As chairman of the state committee, I do not deal with the issues of Sevan. As an Armenian, however, I believe that everything requires systematization and clarity concerning implementation and financing. Emotions have nothing to do with the settlement of the Sevan issue.

-As of today, the sewage system has large debts to the energy system. What arrangements are to be made to redeem the debts?

-The financial rehabilitation program (2001-2003) of the Ministry of Energy stipulates that sewage systems may remain in debt. The moment we get the intended funds from the state budget, (four billion 150 million AMD) for irrigation needs and 560 million AMD for drinking water, we will transfer them to the energy system.

-What criteria are set for the use of Lake Sevan's water?

-In 1997, I said that water should not be drained for energy reasons. It has not been used for

energy since then. According to scientists, even if there is no necessity for that, 150 million cubic meters should be drained from Sevan, because of the evaporation. Thus, our program must be worked out based on 150 million cubic meters. We should rapidly construct the Yeghvard reservoir, complete the Vorotan, bring 160 million cubic meters of surplus water and compensate for that problem through certain small reservoirs at the expense of the above-mentioned surplus amount. I believe that we should speak of these 150 million cubic meters in regard to Sevan's water, and it must be used only to fill the deficiency of water necessary for agriculture. Of course, today we are deficient in agriculture, as we give 50% of water to the land rather than to plants.



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