2.3. Action Plan for *Rural population supply with drinking water of guaranteed quality. Building of local water supply systems technology.*

Providing drinking water to the population is a serious current problem for rural communities in Republic of Moldova and it is foreseen to increase due to climate change. At the same time adequate quality water is essential for the health and well –being of country's population. Despite the efforts put by municipalities, the quantity and quality of water and sanitation services remain inadequate. At the moment the projects funded by foreign donors are carried out in several rural localities, but they do not contribute to the essential reduction of the drinking water deficiency for rural communities.

This measure is part of the global climate change adaptation, reduction of risks caused by deficiency of safe and good quality drinking water in rural areas of Moldova. Prioritising this technology Adaptation team of Human Health sector aimed at increasing investments in this area by promoting private sector participation, also through external investors. Diffusion of this technology will address not only health care issues, but also will bring significant developments in the villages of Moldova.

2.3.1General description of technology

In recent decades both incidence and severity of morbid conditions, as well as deaths caused by extreme phenomena of climate change are becoming more pronounced in Central Europe, including Moldova[19]. They turned into a new problem in the region and the country. Among the worst cases are the heat waves, floods and other weather events that increasingly affect the quality of life and health of a growing number of people.

In the Republic of Moldova the situation becomes alarming because of exhaustion of ground water reserves, as there are more than 150 thousand sources. Intense evaporation from the surface of the soil in summer, especially during heat waves, depletes these reserves. An effective way to adapt to climate change extreme phenomena could be building water supply systems in many rural areas.

This measure is part of the global climate change adaptation, reduction of risks caused by deficiency of safe and good quality drinking water in rural areas of Moldova. In the recent years this measure is being implemented by building of water supply systems, supported by external donors. However, the population of more than 500 rural communities will still suffer from lack of access to safe drinking water.

Environmental benefits. Reducing the volume of water extracted from groundwater will contribute to conservation biodiversity

Social benefits. Social benefits are obvious due to significant reduction of cost for the treatment of acute diarrheal diseases, viral hepatitis and chronic non-communicable diseases. Ensuring access of the rural population to safe quality water sources will substantially contribute to improving the quality of rural life.

2.3.2 Targets for technology transfer and diffusion of *Rural population supply with drinking water of guaranteed quality. Building of local water supply systems*.

Providing drinking water to the rural population is a serious problem despite the fact, that the Republic of Moldova has underground reserves of drinking water of sufficient quantity and good quality. According to the data of the Agency for Geology and Mineral Resources of the Minister of the Environment, groundwater reserves, forecast and confirmed, may cover the need of rural population in the drinking water. The problem however lies in the deficiency of material resources for obtaining and distributing water in rural municipalities.

Financial resources accumulated in the local budget of the mayoralties are designed to ensure educational establishments, health care services and implementation of social projects (construction of roads, overhauls etc.). For other local projects there are not sufficient financial resources. Such activities can be carried out only by a combination of public interest, private sectors and beneficiaries, first of all, external donors. But private interests are very limited, since the private sector is underdeveloped.

The population of more than 500 rural communities will still suffer from lack of access to safe drinking water.

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[19] *Guidance on Water and Adaptation to Climate Change. Economic Commission for Europe, UN. 2009, 130 p.*

At the moment the projects funded by foreign donors are carried out in a number of rural localities, but they do not contribute to the essential reduction of the drinking water deficiency for rural municipalities. So, *the first preliminary target of these technologies is financial its support*.

The traditions and experience in rural area are practically absent. There is a limited institutional capacity and lack of interest in existing institutions. That is why the second target is *to develop local institutional capacities for assuring the rural population with drinking water of guaranteed quality*.

The lack of skilled personnel in rural area reaches 90% of demand. This situation may be eliminated by worker training in the secondary vocational education system which is underdeveloped. Providing with a skilled personal in this field should be carried out by the local mayors or by the relevant consortium supported by beneficiaries or investors. So, the target is *to train skilled workers in the field of potable water facilities*.

In rural area there is a lack of communication and information and public participation in water supply problems. The barrier may be easily surpassed. The removal of barrier requires information campaigns carried out by local government authorities, Public Health Centers, mass-media and NGOs. So, there is a need *to strengthen the information on rural population and intensify its confidence in new water supply technologies and develop relevant traditions, habits, consumer preferences and social biases*.

2.3.3. Enabling framework of technology transfer

In force legal framework is supportive and facilitates the process of water supply in rural localities. Government as major actor, by reviewing and updating government policy contributes to diffusion of proposed technology. Water legislation covers legal basis for water use rights; customary entitlements; quality standards for water supply and sanitation; watershed management and conservation; groundwater utilisation and conservation.
The Government of the Republic of Moldova adopted Decision No. 934 from 15. 08. 2007 on the establishment of the automatic information system called “The State Register of natural mineral waters, drinking waters and non-alcoholic bottled drinks" by which were approved “The sanitary standards concerning use and marketing of natural mineral waters" (annex 1), “The definition and recognition of natural mineral waters”.

National research institutions undertake studies and estimation of reserves of underground water from sources both in terms of volume and quality for the subsequent argumentation of the rural localities drinking water supply policy.

Available capacity building and enabling institutional environment that manages the use of available water resources. Ministry of Environment (Direction of water management) ,Agency “Aplele Moldovei” , Geological Agency of Moldova, Agency “Apa Canal” operate the water supply services, set tariff, manage funds, have the responsibility for integrated management of water resources.

Government supportive to local private business an international investments. Existing international partnership (Swiss Development Agency, USAID, other) proved the possibility of successful implementation of water project in rural communities of Moldova.
Local government (municipalities) and beneficiaries are willing to make contribution to the extent possible, assist in planning.
In Moldova there are trained specialists comprising water and sanitation specialists, economists and financial analysts able to plan, install and maintain water pipe system in rural communities.
Main entities responsible for water resources exploration and monitoring are:

Ministry of Environment is the State body responsible for environmental management, including all natural resources: ground waters, underground waters etc. www.mediu.gov.md

Environmental Quality Monitoring Department in the frame of the ***State Hydrometeorological Service*** performs systematic ecological monitoring of the environmental objects quality (surface water, air, soil, γ-radiation etc.) on a basis of the monitoring network throughout the entire territory of the Republic of Moldova. http://www.meteo.md

The Agency for Geology and Mineral Resources of the Republic of Moldova is subordinate to the Ministry of environment and is responsible for regulatory and coordinating the study, protection and rational use of the subsoil and the development of mineral raw material base of Moldova, including water resources. No Web site.

"Apele Moldovei" Agency is the administrative authority responsible for the implementation of the State policy in the field of water resources management, hidroamelioration, water supply and sanitation, which operates under the Ministry of the environment. Web: http://www.apelemoldovei. gov. md

Institute of Ecology and Geography of the Academy of Sciences of Moldova is in double subordination: Ministry of Environment and Moldova Academy of Sciences. It is responsible for the scientific ensuring in environmental branch. There are some laboratories in Institute: The quality of the environment; Ecobio-indicators and Radio-ecology; Standards and regulatory environment; The ecology of Human Settlements; Biogeo-oceanology with the geo-information group; Dynamic geomorphology; Climatology; Geography and Evolution of Soils; etc. Web: http://www.ieg.asm.md

Ministry of Health ***State Public Health Surveillance Service*** is responsible for establishing the quality and safety parameters of drinking water, monitoring and supervision of safety of all sources of drinking water in the country. Web: http://www.cnsp.md

2.3.4. Barriers identified to technology diffusion.

Economic and financial

- Inadequate access to financial resources.
- Red tape (bureaucracy).
- Uncertain macro- economic environment.
- Lack of entrepreneurial skills to reach the findings.

Policy, legal and regulatory

- Insufficient legal and regulatory framework in estimation of drinking water scarcity impact on population health
- Inappropriate financial incentives and disincentives
- Lack of decision concerning designing of the centralized water supply system

Institutional and organizational capacity

- Lack of interest or limited capacity of responsible institutions.

Network failures

- Lack of involvement of stakeholders in decision making.

Human skills

- Lack of skilled personnel in building of local water supply systems and their maintenance.
- Lack of skilled personnel in estimation of drinking water scarcity impact on population health
- Lack of service and maintenance specialists.
- Lack of entrepreneurs in territories.
- Lack of service and maintenance specialists.

Information and awareness

- Poor dissemination of information to technology users.
- Poor infrastructure for communication of small-scale project support.

Social, cultural and behavioural

- Unknown product, inadequate information, lack of local participation.
- Resistance to change, due to cultural reasons. Rural peoples' resistance to new technologies.
- High discount rates on consumers.
- Lack of confidence in new climate technologies.

Republic of Moldova

Table 2.3.1 Technology *Rural population supply with drinking water of guaranteed quality. Building of local water supply system* technology.

S. No	Measure	Why the measure/action is needed	Who (government, agency, private sector etc.)	Mode of implementing (how should they do it?)	When (0-5 years, 5-10 years, or 10-20 years)	How much the measure/action will cost, how can it be funded (domestic or international funding)	Indicators of success, risks
1.	Enforce the legal and regulatory framework support in order to assure proper functioning of health care measures.	Slackness may frustrate programs and may be crucial for water supply system projects, baffling them. Decision-makers, stakeholders, private business have to be co-partners in these activities.	Government, stakeholders, decision makers of all levels.	By strengthening the legal and regulatory framework and by proper activities management.	0-5 years	Estimated cost of 5-8, 000 mdl is approving a legislative initiative in the Parliament of Moldova. Amount is determined by the Department of National Statistics.	✓ Prompt and opportune decision implementation ✓ Active involvement of stakeholders.
2.	Promote financing of water supply projects in rural areas.	It is crucial for water supply system building.	State Agencies or private sector.	Allocating grants	0-5 years	Popularize this event through roundtables, media, etc. (mdl 50,000 annually). The amount originates form the expenses the state institutions responsible for implementation of these projects will incur and allocated budgetary resources are sufficient to carry out this measure.	✓ Project documentation approved in the established manner. ✓ The risk – unskilled specialists in designing water supply system.
3.	Development of institutional framework for provision of	Because of the lack of legal and regulatory framework in assuring of durable and proper	Republic of Moldova Government	By governmental decision.	0-5 years	Estimated cost of 5-8, 000 mdl is approving a legislative initiative in the Parliament of Moldova.	✓ The set of legal and regulatory framework in assuring of durable and proper functioning

Republic of Moldova

S. No	Measure	Why the measure/action is needed	Who (government, agency, private sector etc.)	Mode of implementing (how should they do it?)	When (0-5 years, 5-10 years, or 10-20 years)	How much the measure/action will cost, how can it be funded (domestic or international funding)	Indicators of success, risks
	centralized distribution of rural population with guaranteed quality of drinking water sources.	functioning of local water supply.				Amount is determined by the Department of National Statistics.	of local water supply. ✓ The risk – slackness of central and local authorities.
4.	Building the water supply systems.	To ensure secure access to drinking water of rural population under all circumstances and all time it is necessary to build up of water supply system.	Local authorities, private sector, Government, international water supply funds.	Implementing water supply projects in rural areas.	5-10 years	426, 000 € for the first year and 46,900 € every year as a depreciation of equipment. The value of this measure depends on the value of the whole project.	✓ Number of localities was water supply systems will be built. ✓ Water supply systems functioning. ✓ The risk slackness of central and local authorities.
5.	Undertake a national investigation of underground water sources as base for policy enforcement in the area.	There are no in depth investigation about underground water resources in Moldova, the policy developers lack of information for developing appropriate policies in the area.	Research institutions, Agency "Aplele Moldovei", Agency for Geology and Mineral Resources of RM, Institute of Ecology and Geography.	Implementing national and international research projects.	0-5 years	Depending on Project funds.	✓ Publications on underground reservoirs of Republic of Moldova. ✓ Developed water map/guides of underground water resources on Moldova's territory.

Republic of Moldova

S. No	Measure	Why the measure/action is needed	Who (government, agency, private sector etc.)	Mode of implementing (how should they do it?)	When (0-5 years, 5-10 years, or 10-20 years)	How much the measure/action will cost, how can it be funded (domestic or international funding)	Indicators of success, risks
6.	Intensifying the inter-sectorial collaboration between local authorities, investors, public services and entrepreneurs.	The lack of inter-sectorial collaboration presents an essential barrier in building of local water system.	Republic of Moldova Government , local authorities, investors, public services providers, entrepreneurs	By strengthening the legal and regulatory framework and by proper activities management.	All time	Do not need funding.	✓ Prompt and opportune of decision implementation.
7.	Strengthen human capital base in the Human Health sector.	Because of the insufficient number of skilled specialists in rural area in technologies of drinking water supply.	Government, Universities, Colleges.	By appropriate planning and motivation of young people. By strengthening the university and college training process in technologies of drinking water supply.	0-10 years	Budget and private financing.	✓ Number of final-year students. ✓ The risk – low salary of employees.
8.	Better informing of rural population about health problems related to water quality.	Most of the rural population is not aware of the negative parts of the climate change and of future drinking water scarcity on human health.	Central and local authorities, NGOs	By promoting the relevant information through mass-media.	0-5 years	10,000 mdl annually for each locality involved in the project. This can be supported by the State Ecologic Fund.	✓ The number of people being aware of the negative parts of the climate change and of future drinking water scarcity on their health.

Republic of Moldova

S. No	Measure	Why the measure/action is needed	Who (government, agency, private sector etc.)	Mode of implementing (how should they do it?)	When (0-5 years, 5-10 years, or 10-20 years)	How much the measure/action will cost, how can it be funded (domestic or international funding)	Indicators of success, risks
9.	Rising population information and awareness about climate change impact on human health.	The social effectiveness of the building of local water systems is one of the main scopes of this program.	Government, central and local authorities, NGOs	By testing public opinion.	0-5 years	Making household surveys in towns involved in the project – 50,000 mdl for a supply project. The amount can be achieved within the projects annually announced by Academy of Sciences of Moldova.	✓ Number of population indicating. ✓ Improvement of life conditions. ✓ The risk – slackness of central and local authorities and NGO's