



# **LOCAL CLIMATE CHANGE ADAPTATION PLAN OF MIHAILENI VILLAGE, RISCANI DISTRICT 2016 – 2020**

## **Authors of the document**

Mr. Cecan Valerian, Primar, (Held of Local Public Authority), Mihaileni village  
Mr. Cristian Ion, Secretary of the Local Council  
Ms. Galaşanu Liudmila, Specialist of the Land Relations Agency  
Ms. Ciobanu Galina, Head of the Gymnasium Mihaileni  
Mr. Toma Andrei, Doctor, President of the Parents' Association, Councilor  
Mr. Şonţu Lilian, Head of the Lyceum "E.Coşeriu", Councilor  
Ms. Spînu Viorica, Head of the kindergarden  
Ms. Spînu Victoria, Social assistant  
Mr. Spataru Gheorghe, Head of Day Center for elderly people  
Ms. Liuliciac Angela, Public association „Speranţa-Mihaileni”  
Mr. Iovu Andrei, Pensioner  
Ms. Său Tatiana, Nurse  
Ms. Pulbere Liliana, Nurse  
Ms. Stratin Violina, Nurse  
Ms. Zorila Ludmila, Head of the Post Office  
Mr. Prisacaru Anatolie, Councilor  
Ms. Vrabie Galina, Head of the Public Library  
Ms. Căpriţa Lucia, Art director  
Mr. Solcanu Simion, Director of Cultural House  
Mr. Iarmaliuc Vasile, Teacher TL „E.Coşeriu,,  
Ms. Popovici Tatiana, Organisator of the Gymnasium  
Mr. Moscalu Iurie, Teacher,Councilor  
Ms. Gheorghîţa Liubovi, Librarian, councilor  
Mr. Munteanu Igor, Administrator “Mihaileni service”  
Mr. Moscalu Vasile, Consutant from Rural extention service ACSA  
Mr. Ursu Ion, District councilor  
Ms. Mîndru Nina, Councilor  
Ms. Cepoi Valentina, Accountant  
Mr. Cepoi Adrian, Administrator of household,Councilor  
Mr. Iarmaliuc Nicolae, Director of individual enterprise, District councilor  
Mr. Iarmaliuc Vitalie, Director of individual enterprise  
Mr. Grumeza Vasile, Director LLC „Grăgălin Agro,, Councilor  
Ms. Spînu Ana, Accountant LLC „Tocado Agro,,  
Mr. Gheorghîţa Igor, Administrator of household, Councilor  
Ms. Josanu Elizaveta, Director Intreprin. Publica, Councilor  
Mr. Chirila Adrian, Administrator “Avicola,”  
Mr. Gheorghîţa Iurie, Councilor  
Mr. Moşanu Grigore, Chief veterinary doctor

## **Copyright and distribution of materials**

This document has been developed by the Public Association "Mostenitorii" with the support of Public Association EcoContact, under the program „Climate Forum East” (CFE II). This program is financed by the European Union, Austrian Development Cooperation and the Austrian Red Cross.

Copies of all or part of this study may be made for non-commercial use, providing the source is acknowledged. MEM Riscani and CFE II would appreciate receiving details of this use. Requests for commercial reproduction should be directed to [cfe@vox.md](mailto:cfe@vox.md) and [cfe@redcross.at](mailto:cfe@redcross.at)

## Introduction

Currently, global warming involves two major problems for humanity: on the one hand, **need for a drastic reduction of gas emissions with greenhouse effect** in order to stabilize the concentration of these gases in the atmosphere for preventing human influence on the climate system and to enable natural ecosystems for their natural adapting, on the other hand, need of adapting to climate changes, taking into account that these effects are already visible and unavoidable due to the inertia of the climate system, regardless the outcome of actions to reduce emissions.

Moldova is a country highly vulnerable to climate variability and climate change. Socio-economic costs as result of climate-related natural disasters, such as droughts, floods and hails are significant. During 1984-2006, Moldova's annual economic losses caused by natural disasters amounted to nearly \$ 61 million, or 2.13 percent from the Gross Domestic Product (GDP). The drought from 2007 caused losses estimated at about 1.0 billion USD, floods from 2008 caused damages of around 120 million dollars, while those ones from 2010 had an adverse economic impact on GDP of about 0,15 percent. Total damages and losses were estimated at about 42 million dollars, affecting predominantly rural and agricultural parts of the country. As a result of climate changes it is anticipated that both intensity and frequency will increase.

Climate change is not limited only to a single sector; therefore, resilient development, it is necessary to take into account the risks, that could appear after climate changes in all development activities. **Adaptation to climate change** is a complex process taking into account the variability of effects from region to region, depending on exposure, physical vulnerability, socio-economic development degree, capacity of natural and human adaptability, health services and disaster surveillance mechanisms. It requires a further coordination and also an encouraging institutional and legislative environment at all levels, including the local one. To facilitate this on the local level Namely in such a context occurs the Local Action Plan for Adaptation to Climate Changes.

**Local Climate Change Adaptation Plan (LCCAP)** of Mihaileni village, district Riscani was developed in a participatory manner, involving representatives of all local stakeholders. Citizens' participation in drafting LCCAP helped to increase public awareness, ensure the ownership and initiative spirit of people, increased their responsibility for decisions made on reducing the negative impact of climate changes and adaptation activities for the whole community. LCCAP of Mihaileni is innovative for the village and for the region as core elements such as the impact of climate change, identification of possible climate change adaptation measures, involvement of community members in developing the strategy of adapting to these changes, were new to the community.

The first step in development of LCCAP in Mihaileni was a partnership agreement between the mayoralty with Public Association (PA) Mostenitorii (Balti) that stipulated involved stakeholders, legitimacy, evaluation, budget, and the process. Participatory approach was a guiding principle along the whole process of implementation. Established working group met on a regular basis for identification problems, needs and drafting a five-year plan. Focus groups

were organized for public discussions. Additionally, the working groups realized a number of awareness raising activities to advance the level of understating of the climate change and adaptation measures within community members. Working group was in close contact with the Local Public Authorities (LPA) to ensure their commitment and feedback as well.

## **Description of Mihaileni village**

### Geographical position:

Mihaileni is a in district Riscani district bordering on the South by Riscani town; on the North with the village Baraboi; on the East with the village Ochiul Alb and on the West with the village Ciubara. It is located at a distance of 9 km from the district center Riscani and of 22 km from the railway station Drochia. The total area of the village is that is divided according to data below:

- Arable land – 3988,97 ha
- Pasture – 873,76 ha
- Multiannual plants – 274,44 ha
- Village area – 410,37 ha
- Land owned by the state – 89,03 ha
- Land in Administrative-territorial Property – 1502,34 ha
- Land in Private Property – 4571,16 ha
- Potential of Irrigation – 220 ha.
- Water sources – 74,01

### Population:

According to 2004 census, the total population is 4,465 inhabitants, 48.71% - are men and 51.29% - women, children under 18 – 800 pers.; retirees – 1200 pers. The average size of a household was 2.6 pers.

### Local Governance

Mihaileni community consists of one village, Primar, the Head of the Local Public Authorities is elected by the commune members for the period of four years, the same mandate is for the members of village council.

### Local infrastructure

Only the central road of the village is paved, all facilities have electricity access. There are 4 functioning deep water wells in the village. Public water supply of the total length of 32 km covers partly the access, while the another part of population uses water from wells. About 70% of households are connected to the fixed telephone line of State Enterprise (SE) "Moldtelecom". Mobile coverage is good for all three operators in the country.

### Local business

There are 4 working Limited Liability Companies (LLC), 18 commercial units and 549 peasants' households in the village Mihaileni. On the total area of agricultural land is 531.09 hectares following crops are cultivated: sugar beet, sunflower, fall wheat, spring barley, soybeans, rapeseed. The technical basis is satisfactory.

### Civil Society

The associative sector is at the beginning stage of development, being represented by the Association of Parents and Teachers of the Lyceum "E.Coșeriu", Association of Parents and Teachers of Mihaileni gymnasium, PA "CeVaPeSemănătorul", PA " Flacăra albastră " Public Association of Women,, Speranța-Mihaileni,,. Access to national and local TV posts and radio is in the village, around 500 people are subscribed to different newspapers and magazines.

### Environment

Mihaileni is situated on a corrugated relief. Ground waters are at a medium depth. Its territory is characterized by a moderate continental climate with short and comparatively warm winter and long and hot summer. It is subjected to natural disasters (as drought, hail and frost). The annual amount of precipitation is 450-500 mm. There are 6 deep water wells, 4 from them are in functioning. In the village there are also 640 mine wells, but the quality of water does not meet all hygienic-sanitary requirements to be considered the drinking water. There is an authorized landfill, but the negative health impacts are observed due to the unauthorized landfills storages in the village.

### **Future climate and climate trends**

According to the Third National Communication, for generation of future climate projections and climate risks scientists have used for the northern part of Moldova as baseline period: 1961 to 1990 with projections covering two time horizons: 2010-2039 and 2040-2069. To generate possible future climates a coupled atmosphere-ocean General Circulation Model developed by the Commonwealth Scientific and Industrial Research Organization been used incorporating Special Report on Emission Scenarios A2 and B1 to downscale climate projections for the North Zone of Moldova. The A2 scenario is based on “a very heterogeneous world with continuously increasing global population and regionally oriented economic growth that is more fragmented and slower than in other storylines”. The B2 scenario is based on “a world in which the emphasis is on local solutions to economic, social, and environmental sustainability, with continuously increasing population (lower than A2) and intermediate economic development”. According to the ensembles driven by the A2 emission scenario, it is estimated that the Northern region will experience the most significant warming during winter, with average temperatures rising up to 4.9<sup>0</sup> C by 2080s. The decies in precipitation is confirmed by all scenarios varying from -15.7% % (A2) to -1.5% (B2) as stipulated in the Third National Communication of the Republic of Moldova Under the United Nations Framework Convention on Climate Change.

During the last decade village Mihaileni mainly has registered the damage from natural disasters mainly being heavy rains and droughts. For example, during the year 2007 when the whole territory of the Republic of Moldova has been affected by the severe drought, Mihaileni has registered the total damage of 8,426.00 thousand lei caused by heavy rains and drought. Data from the Riscani meteorological station located near Mihaileni village show a clear increase in both mean annual temperature and precipitation from 1990 to 2010:

- Average annual temperatures have increased by approximately 1<sup>0</sup>.
- Average precipitation has increased by 28.2 mm, or circa 4.6%.

According to the climate change projections, village Mihaileni will face warmer and wetter winters and springs, but hotter and drier summers and autumns. Extreme weather events such as drought, heavy rain and strong wind, heavy rain, strong wind and hail, lengthy rain, strong wind and flood, are likely to become more frequent in the future.

## Risk Assessment and Problems Identification

Three meetings with the target groups by using focus-group method during the preparation of developing LAPACC were organized. Priority sectors of intervention to mitigate the consequences and adapt to the future climate change have been identified:

1. Agriculture
2. Infrastructure
3. Biodiversity and ecosystems
4. Health sector

Above mentioned priority sectors have been identified based on the results of the SWOT analysis that have been done in a participatory manner, including the findings and results from the national- and local level analysis and strategies.

### SWOT analysis

<b>Strong points</b>	<b>Weak points</b>
<ul style="list-style-type: none"> <li>➤ active social, health, educational AND civil society institutions that can play a role in the climate change adaptation process;</li> <li>➤ experience in implementation of projects (including NGOs) related to thermal insulation of buildings energy efficiency, using of recyclable materials that can be applied to climate change adaptation projects;</li> <li>➤ significant potential for organic farming including the small farms and local livestock;</li> <li>➤ varied natural heritage and high potential to practice a sustainable environmental agriculture;</li> <li>➤ potential for the development of medicinal and aromatic plants;</li> <li>➤ existence of an infrastructure and communication networks: power supply, water supply and natural gas supply networks IT communication infrastructure, fixed and mobile coverage;</li> <li>➤ opportunities to capitalize alternative energy;</li> <li>➤ access to quality surface and underground drinking water sources, existence of mineral springs;</li> <li>➤ reduced use of chemical fertilizers for subsistence agriculture;</li> <li>➤ stable partnership between community, school, church, NGOs and experience in accessing external funds;</li> </ul>	<ul style="list-style-type: none"> <li>➤ aging population and slower adaptation of adults and old people from the village to the climate change challenges;</li> <li>➤ poor awareness of population and economical agents in environmental issues and adaptation to climate changes;</li> <li>➤ a relatively low financial capacity of residents;</li> <li>➤ low community budget;</li> <li>➤ high risk of drought and water scarcity and increased necessity of irrigation;</li> <li>➤ high risk of pests, farm diseases and weeds;</li> <li>➤ underdeveloped agricultural infrastructure;</li> <li>➤ pollution of surface and ground waters due to lack of sanitation and uncontrolled domestic wastewaters;</li> <li>➤ procurement system is very restrictive in winning contracts by local firms;</li> <li>➤ No sewerage network and wastewater treatment plant;</li> <li>➤ locals' limited financial possibilities to rehabilitate buildings;</li> <li>➤ lack of modern equipment for the current waste management system;</li> <li>➤ lack of an extended public sewer;</li> <li>➤ domestic wastewater discharges in unsuitable places;</li> <li>➤ thermal insulation of buildings is inappropriate;</li> <li>➤ soil degradation is increasing but there is lack of facilities to composting biodegradable wastes;</li> </ul>

<b>Opportunities</b>	<b>Constraints</b>
<ul style="list-style-type: none"> <li>➤ Raising skills and understanding of adaptation to climate change through participation in training programs developed within projects financed from abroad;</li> <li>➤ involvement of local authorities in community problems in order to identify financial and material solutions, increasing the role of NGOs on organization / training the population in climate adaptation;</li> <li>➤ support the citizens' participation in various forms of voluntary activities;</li> <li>➤ existing the National Climate Change Adaptation Strategy;</li> <li>➤ implementation of environment projects / programs, for restoration of the infrastructure;</li> <li>➤ promotion of pilot projects for adapting multifunctional households;</li> <li>➤ promoting / stimulating the establishment of agricultural associations for an intensive changing regulations on public procurement; land exploitation;</li> <li>➤ trend to diversify services related to agriculture;</li> <li>➤ possibility of planting energy willows;</li> <li>➤ existence of EU and other donors' funds for rural development and environmental protection;</li> <li>➤ possibility of expanding the green areas;</li> </ul>	<ul style="list-style-type: none"> <li>➤ limited resources to support NGO initiatives;</li> <li>➤ low yields in agriculture;</li> <li>➤ associations of farmers are underdeveloped;</li> <li>➤ socio-economic costs caused by natural disasters associated with climate are significant;</li> <li>➤ depopulation of villages determines the decreasing of workforce for agricultural activities;</li> <li>➤ unstable legislation;</li> <li>➤ migration of youths with high education and lack of interest for agriculture;</li> <li>➤ increasing of prices for purchase of machinery, agricultural equipment, seeds, fertilizers, agricultural works</li> <li>➤ increasing risk of leaving and degradation of the built environment;</li> <li>➤ high cost of preliminary documentation and need for co-financing projects;</li> <li>➤ Lack of informational programs / consultant in adapting to climate changes;</li> <li>➤ reducing of public investments in the infrastructure as a result of the financial crisis;</li> <li>➤ consumer behavior in the community</li> </ul>

# Climate change adaptation activities

## **Direction 1: Adaptation of agricultural sector for the negative consequences of climate change**

Objectives of the activities planned for this direction are aimed at raising the adaptation potential for the crop and livestock sectors of agriculture. Main stakeholders involved for the work in this domain are local public authorities, NGOs, farmers. Budget will be allocated from the district level budget, local budget, but also fundraising activities will be doing be involved actors to cover the financial gap.

### **Adaptation of the crop sector**

- 1.1 Introducing new agricultural technologies (no till, crop rotation etc.)
- 1.2 Increasing soil fertility by using composted biodegradable wastes
- 1.3 Modernization of irrigation systems
- 1.4 Soil erosion prevention
- 1.5 Introducing water conservation technologies

### **Adaptation of livestock sector**

- 1.6 Creating the platform for manure storage
- 1.7 Construction of biogas capturing facilities
- 1.8 Introducing the pasture management approach

## **Direction 2: Adaptation of infrastructure and transport sector to climate change**

Objectives of the activities planned for this direction are aimed at raising the adaptation potential for the infruscturcure and transport sector. Local authorities from the district and community levels are the main responsible for the implementation of this direction. National, district, local budget, national programs, bilateral and donor support are seen as the possible means of financing.

Activities are as follows:

- 2.1 Establishment of early warning systems for the natural and man-made disasters
- 2.2 Increasing the territory of green spaces
- 2.3 Isolation of the buildings, with the primary focus on the public buildings
- 2.4 Diversification of the energy types, developing the production of the renewable energy
- 2.5 Establishment and equipping of the voluntary fire-fighters brigade

## **Direction 3: Biodiversity conservation and ecosystems adaptation to climate change**

Objectives of the activities planned for this direction are aimed at raising the adaptation potential for ecosystems to the negative impacts of climate change and ensure the biodiversity conservation. Local authorities from the district and community levels are the main responsible for the implementation of this direction. National authorities in charge, such as State Ecological Agency, State Ecological Inspection will be closely involved in the identification and realization of measures. National, local budgets, the National Ecologic Fund, EU and other donors' programs are seen as the possible means of financing. Activities are as follows:

- 3.1 Rainwater harvesting



- 3.2 Delimitations with the vegetation of the habitats
- 3.3 Introducing the system for waste water recycling
- 3.4 Introduce into the practices the heat and low temperatures resistance species
- 3.5 Afforestation of the degraded land
- 3.6 Introducing energy crops and using the residuals for biomass production
- 3.7 Public raising awareness campaigns
- 3.8 Diversifying the energy sources

#### **Direction 4: Adaptation of health sector to climate change**

Objectives of the activities planned for this direction are aimed at raising the adaptation potential for the health sector. Local authorities from the district and community levels are the main responsible for the implementation of this direction. National, district, local budget, national programs, bilateral and donor support are seen as the possible means of financing.

Activities are as follows:

- 4.1 Promoting health lifestyle
- 4.2 Creation of recreational area during the heatwaves
- 4.3 Raising citizens' understanding and knowledge on how to behave in case of cold- or heat-waves
- 4.4 Reduction of epidemiological factors concerning the impacts of climate change on health.