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CLIMATE CHANGE ADAPTATION ACTION PLAN OF CAUSENI TOWN

Executive summary



This document has been developed by „Tighina informational Center (TIC)“ in the framework of the project "Development of local Climate Change Adaptation action plan in Water Resources and Biodiversity sectors for Causeni Town" with the financial support of the NGO 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.

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CAUSENI
REPUBLIC OF MOLDOVA

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Purpose

Climate change alone is rarely the most serious problem facing any community. However, the effects of climate change can exacerbate existing problems and drive new challenges. By assessing the impact of climate change on challenges facing a community, a good action plan can identify entry points for activities which will reduce the impact of climate change on communities and livelihoods, and guide future planning for the changing risks associated with climate change.

The purpose of the plan is to:

- Identify the main challenges and sectors in the community that are affected by climate
- Propose realistic solutions and approaches to allow the community, local government and civil society to adapt to the current and future challenges of climate change

The plan provides clear guidance for community and local government for actions they can take to reduce their vulnerability to climate change and extreme weather, and adapt to future changes.

Methodology

The Climate Change Adaptation Action Plan of Causeni was developed in a participatory manner by involving community leaders, civil society organizations representatives and local authorities thus creating a strong sense of community ownership which will ensure the plan's implementation, monitoring and further evaluation.

The key steps in the process of its development were the following:

- Assessment through desk research based on existing data and interviews with local experts from relevant institution and community members followed by analysis of strengths and weaknesses resulting from assessment;
- Establishing community overview meaning its vulnerability level and sartorial risks analysis
- Data validation and feedback collection through several public hearings with different target groups;
- Drafting a series of recommended adaptation measures divided per sector for the implementation by the local authorities, civil society organizations and community.
- Lobby for official approval by the mayoralty and adoption of the plan.

CAUSENI CITY AND CLIMATE CHANGE

Community overview

Căușeni is a city and the administrative center of Căușeni District, Moldova and is located in the southeast part of the Republic of Moldova. The city is crossed by Botna river.

Population

Its population at the 2015 census was 19.900. Population number by gender is 9149 women and 8486 men. Population of Causeni has a share of 22% of the total population of the district itself (90,500 inhabitants).

Climate

Causeni is characterized by a temperate continental climate with mild and short winters and warm and long summers. Average annual temperatures range between -9.9 9.2 degrees Celsius. Positive temperatures are registered during 9 months. The average temperature of the warmest month - July - plus 21.0 to 22.5 degrees Celsius, the coldest - January - minus 15-20 degrees.

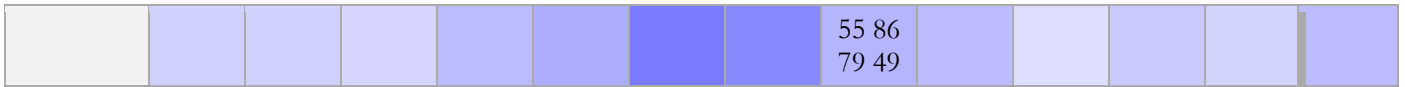
The amount of annual rainfall is 500-550 mm, of which about 350 mm incumbent during the warm period and 150-200 mm during the cold one.

The first frost occurs at 10-15 / X and the last at 20-25 / IV.



The average temperatures and precipitation for Causeni

Month	Jan	Feb	Mar	Apr	May	Jun	jul	Aug	September	Oct	Nov	Dec	annual
average maximum °C	-0.5	1.3	7.0	15.9	22.0	26.2 26.0 21.8 15.2 7.6 2.1 14.13							24.9
Low average °C	-7.5	-5.4	-1.6	4.5	9.9	13.1	14.5	13.5	9.5	4.3	0.3	-4.0	4.26
Rainmm								31 28 28 44					



Summary of climate change impacts and risks

Depending on the geographical area, the impacts associated with climate change can be different from one region to another. For Causeni, the assessment led to the below major results and were prioritized the following

- The increase of river Botna water, which could cause massive flooding.
- Droughts during summer, which may cause fire that affects agriculture and overall biodiversity of the city.
- Changes in the water quality and quantity
- Impact on public health during heatwaves

Also it was assessed the following meteorological and dangerous phenomena, which may occur in the territory:

Frost – it affects negatively electrical and telecommunications networks, during winter, during as it falls with a thick layer of ice from 5 to 10 mm, and once in 5 years - up to 15 -20 mm. This can lead to damage to the network, which stops the supply of electricity, communication failures, damage to green areas and affects the transportation as well.

Droughts - this phenomenon occurs with a frequency of 3-5 years and includes generally south and center of the country, including the district Causeni. Drought leads to losses (from 10 to 50%) of the agricultural harvest. The decrease in groundwater affects water supply and its quality.

Heat - extended period of time, usually it occurs during more than five days in a row, which is characterized by exceeding the maximum temperature 5-100 C area (for Causeni district - 25-300C). Heat waves of high temperatures occur in the village with a frequency of 3-5 years and affects agriculture and population health status.

Hail – on a district level it is particularly dangerous during July and August. Hail has a diameter of up to 6 cm, it occurs during hot and ground cover with a thickness up to 10 cm. This leads to a partially or complete loss of the crops and can cause trauma to animals, damage to roofs, windows, buildings etc. The district is 96% protected from (80800 ha of agricultural land from 84,000 hectares) hail, including t. Căușeni.

Drought - it is manifested by the elevated temperatures of the layer of air for a long time in combination with the lack of moisture in the soil for the growth of plants. Drought causes considerable loss of agricultural harvest.

Reduced water level in the river and groundwater can lead to some difficulties in providing the population with drinking water.

Damage to property may constitute 10-50% of the crop.

Winter sudden change in temperature can be from positive to -25 0 C below zero, it can take place in the city once in 10 years and can affect the crops in a proportion of 40% and lead to a loss from 2 to 10% harvest orchards and vineyards.

Spring and autumn frosts -reducing sharp temperature (during plant vegetation) layer of air from positive to negative (from -3 to -10 degrees) occurs almost every year and includes considerable and sometimes entire territory the district.

This can lead to damage or perishing plant, harvest future (where spring frosts) or harvest finished (if frosts of autumn).

the loss of crop in the district can be 10%.

Landslides – they are characteristic for the entire territory of the district. In total there are 13 sectors with landslides records. This leads deteriorating of the buildings and structures (houses), loss of life and animals.

Where landslides are possible irreversible

Locality	Surface	Cause	Year	Real status
Căușenii Vechi Căușenii Noi	52	Ground waters	1986	neactiv

CLIMATE CHANGE IMPACT ON WATER RESOURCES

The town has two lakes with a total area of 237 ha, 8 artesian wells and 140 mine wells. Dams are formed from clay and soil and are in a satisfactory condition. Three objects represent a threat to in case of flooding.

All aquatic resources have riparian strip protection. The basins are covered with vegetation and mud, with the exception only of an object.

The average per capita of daily water consumption is 120 liters of water against 100 as the average usage on a national level. During droughts, most of the wells at north of the city dry. In the south, the water from wells is polluted. Therefore, revitalization of the aqueduct system and building new sections is a priority for the city.



One of the representative factors for the city in terms water resources is the Botna river, which has a total length of 150 km, 10 km of which runs through the city. Botna River is one of the four largest rivers in Moldova, which has a total length of 150 km, 10 km runs through the city. Causeni is the unique locality located on the riverbank Botna. The river crosses the entire city, there are built several bridges over it, both pedestrian and for road transportation, on the riverbank stretches the city park. In the 70s of the 20th century it was built a open system of canals from ground for evacuation of rainwater. Botna river was straightened, deepened and dammed. Over time both the existing channels, as well riverbed Botna were silt. Thus increasing of water level in Botna river in rainy periods can cause massive flooding. On the banks of the river are 150 houses that can be subjected to this danger.

Regarding the impact of climate change on water supply systems and sanitation have been identified two major issues:

- warmer and shorter winters lead to a decreased volume of snow and melting seasonal snow early and increased pace;
- summers with extreme temperatures and drought leads to a loss of quantity and quality of water resources and increases demand for water usage.

Excess water (flood) has the effect of rapid increase in the quantity of suspensions in water source, with consequences on the treatment process.

The risks associated with climate change leads to the following effect:

- affecting the water quality level

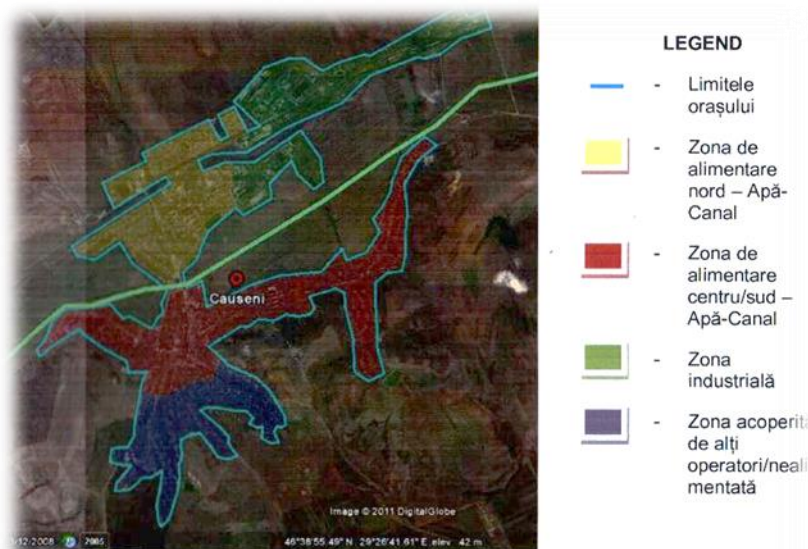


Fig. 2-2 Limitele estimate a zonei de alimentare cu apă în or. Căuseni

- increased incidence of illness due to polluted water;
- unanticipated operating costs of the sewage system / treatment
- increased pollutant concentrations;
- accumulation of fermentation gases in the pipeline;
- short rains with high intensity.

RECOMMENDED MEASURES FOR ADAPTATION

The following measures were proposed for adaptation to climate change in the water sector:

- to elaborate of local hazard maps and flood risk; floods assessment, droughts and water scarcity in the river basin Botna;
- to include risk maps into local development/urban plans;
- to analyze the influence of climate change on the flow of river;
- to assess water requirements for crops;
- to assess the water requirements for the main uses (drinking water, industrial water, water for livestock, fisheries, etc.)
- transport facilities and rehabilitation of water supply and technological changes (promotion of technologies with reduced water)
- to increase water recycling level for industrial needs;
- to change the types of crops by using those adapted to conditions with less water usage;
- application of new methods and technologies for the rehabilitation / construction of dams and carrying protection;
- to install better flood forecasting and warning systems;
- to increase forest area for minimizing the level training runoff;
- to educate the population on prevention, preparedness and response in case of floods;
- construction of special waste collection ponds and sewage, to prevent their direct discharges into surface waters;
- construction of water protection areas;
- construction of wastewater treatment plants;
- execution of the embankment and the construction of dams;
- to conduct rehabilitation treatment plant operations;
- to conduct monitoring operation of treated wastewater and surface water in the territory;
- to facilitate attraction of investments for cleaning and arranging riverbed Botna 33 km from the city as required
- to create riparian strips to protect water basins;
- to engage stakeholders with a focus on private sector in greening activities;
- to build two lakes with special operation to supplement the available water resources in critical situations;
- to promote the use of treated water and transforming them into an important source for covering industrial and public needs;

Biodiversity and forest

The total area of forestry land in the district is 14 700 ha Causeni district. Of these, t. Căușeni has 150.9 hectares of forested area, respectively 5.6% out of the total district's area and is the fifth place within the total number of localities from the district.

The forests and protective strips are particularly affected by illegal lodging, cattle grazing and illegal dumping of garbage. However, trees species - oak, walnut bearing and fruit trees were preserved on all surfaces where the main cuts were made. Also, specialists from Forest District Căușeni began regeneration of forests in Causeni. Thus almost every surface has reached the required age is regenerated. Output from Căușeni to Stefan Voda has already been cut, with the aim of regenerating more than 2 hectares of forest.

In. 2015 Causeni forest cultures were planted on an area of 23.3 ha (in 2015 there were no extension of FF), of which by the Forest Causeni - 16.0 ha.

Assisting natural regeneration in the district was conducted in an area of 125.9 ha, including OS Causeni - 69.7 ha.

Threats:

- increased temperatures can cause unfavorable conditions for forest vegetation;
- in wooden areas is projected a considerably decrease of forest productivity due to increasing temperatures and decreasing rainfall volume;
- increased incidence of by insects' attacks or pests known as forestry danger or existing insect species that begin to affect the forest or new species coming from warmer areas;

RECOMMENDED MEASURES FOR ADAPTATION

The most appropriate adaptation measure to climate change is intensifying the process of reforestation. This would help to balance forest ecosystems, reduce soil erosion, would prevent landslides and prevent flooding. Forests must be populated with species of trees less vulnerable. Tree species resistant to climate change must be strong and new types of pests.

These measures should be accompanied by adequate monitoring of the health of forests and their development.

- project design and implementation of planting shelterbelts to protect agricultural land, water, reducing soil erosion, landslides and for erosion control purposes;
- establishment of forest plantations to meet the energy needs of the population;
- promotion of energy crops and use of residual forest biomass resources;
- increasing capitalization of wood by-products and the correct use of wood according to its quality;
- planting species that will benefit from the new environment and realize higher total biomass accumulation throughout the production cycle;
- identification and plant species tolerant to water stress or high temperatures lasting tolerant against frosts;
- prohibiting of land use change that is covered with forests and other forest vegetation;
- proper arrangement of the territory, taking into account the actual and potential effects of climate change;
- strengthening the capacity of forest surveillance, control, assistance and coordination;
- developing improvement programs for effective management of pastures;
- greening pits banks by planting trees, 30 hectares;

CONCLUSIONS

Plan's success or achievement depends largely on the participation of all inhabitants in the implementation and monitoring. Specific stakeholder involved in adaptation planning and further implementation of the action plan in order to achieve its objectives and increase the level of city resilience toward climate change are the following:

1. Local government (Council members, Mayor, City Hall)
2. Citizens
3. Civil society organizations
4. Entrepreneurs
5. External structures (district council, government, international organizations).