



# LOCAL ACTION PLAN ON ADAPTATION TO CLIMATE CHANGE

Palanca village  
Stefan Voda district  
Republic of Moldova



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## List of Acronyms

CFE	Climate Forum East
GDP	Gross Domestic Product
GHG	Greenhouse Gas
LCCAP	Local Climate Change Adaptation Plan
LPA	Local Public Authorities
NGO	Non-governmental organization
PA	Public Association
UNFCCC	United Nations Framework Convention on Climate Change

## Introduction

Climate Change will be one of the major threats to the stability on all levels during coming decades. The capacity of local actors to manage climate change risks will be as a basis for sustainable development of the society especially in rural areas. Currently climate change is recognized as a variable that aggravates simultaneously occurring environmental, social, economic, and political pressures and stressors. The Republic of Moldova has signed the United Nations Framework Convention on Climate Change (UNFCCC) on June 12, 1992, ratified it on March 16, 1995 and for our country the Convention entered into force on September 7, 1995. On January 28, 2011 the Republic of Moldova has associated with the Copenhagen Agreement of the United Nations Framework on Climate Change. Under this Agreement, our country has set a new target aimed at Greenhouse Gas (GHG) emissions reduction, specifying "reduction of total national levels of GHG emissions by not less than 25% by 2020 compared to the reference year (1990).

The socio-economic costs of climate related natural disasters such as droughts, floods and hail are significant and both their intensity and frequency are expected to further increase as a result of climate change. During the period 1984-2006, the Republic of Moldova's average annual economic losses due to natural disasters were about US\$61 million, or 2.13 percent of national GDP. More recent events have had a significant impact: the 2007 and 2012 droughts caused estimated losses of about US\$1.0 billion, respectively US\$1.25 billion; the 2008 floods cost the country about US\$120 million. Climate change is increasingly recognized as fact of national importance, but so far the national strategic framework lacks integrated climate change mitigation or adaptation measures. The National Adaptation Strategy for the Republic of Moldova that has been endorsed by the Government in 2014 represents the national framework that guide coping with the climate related challenges. This umbrella strategy create the enabling framework and is translated into the local level activities for one community, Palanca village by this this respective document.

Local Climate Change Adaptation Plan (LCCAP) of Palanca village has been developed during year 2016 with the methodological support from the program „Climate Forum East“(CFE II), in partnership with Public Association “Ecological Movement, Stefan-Voda” and Public Association “EcoContat”.

The working group has been established at the beginning of the process, including the main stakeholders on community level. Support from the national level stakeholders has been essential for identifying climate trends, possible solutions and expected financing. Participatory consultation process resulted in the comprehensive approach for adaptation to climate change.

The purpose of the stakeholder process was to threefold:

1. Deepen community member understanding of climate risk management options.
2. Identify concerns and issues arising within specific stakeholder groups about climate risks (including climate change) and management options.
3. Identify ongoing or planned developmental activities which will have an impact on climate risk management or into which climate risk management can be integrated.

The lack of awareness and/or climate change, adaptation options and needed behavioral change provides a significant obstacle to successful climate resilient implementation. That's why capacity building, knowledge management activities are one of the key priority areas of the intervention on the local level in Palanca village.

## Overall Objective, Specific Objectives and Expected Impact

**The overall objective of the LCCAP** is to ensure mainstreaming of adaptation measures to the effects of climate change in the social-economical development of Palanca village.

That will be achieved by reaching of three specific objectives:

- (1) Providing protection and conservation of biodiversity with the appropriate use of its components.
- (2) Ensuring climate resilient development by introducing adaptation to climate change in identified priority sectors: water, soil, waste
- (3) Strengthening capacities of local administration in environment and climate change, to ensure effective implementation of adaptation measures at local level.

Local authorities play an important role in identifying and further implementation of adaptation measures at the local level, thus it is high-priority to increase awareness, develop capacities to bring a behavior change of main stakeholders.

### **The overall objective and expected impact**

The main result of LCCAP of Palanca village implementation will manifest in raised capacities of local authorities to adapt the development process to climate change by attracting additional funding, realization local policies that will ensure the reducing the impact of climate change on local economy being the result of raised climate resilience.

## **Description of Palanca village**

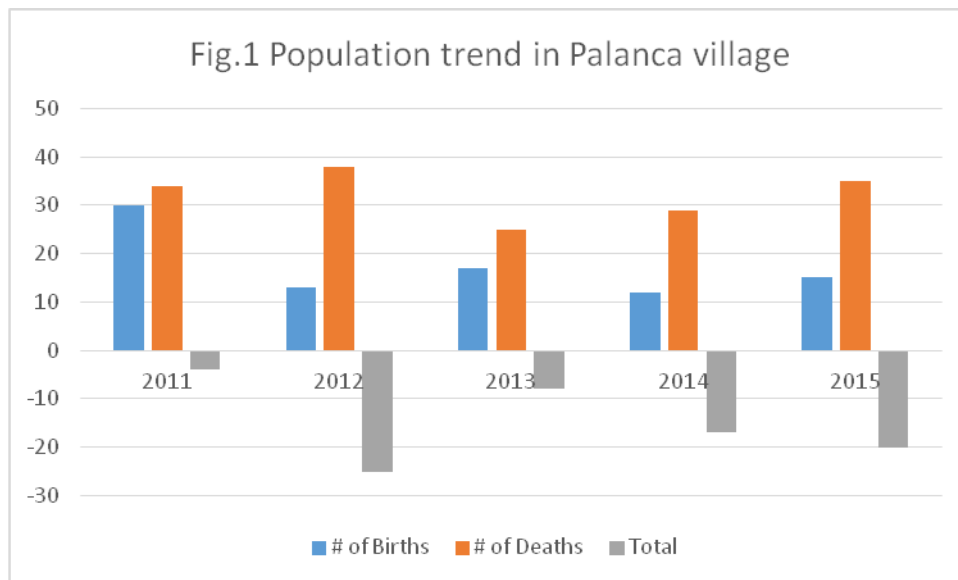
Village Palanca is located in Stefan Voda District, in the south-east part of Moldova. The distance from the capital is 180 km from capital, 50 km from Stefan Voda - the main town of the district, Palanca is located in the border area with Ukraine, being located at the distance of 60 km from Odessa. Palanca is situated on the right bank of Nistru river, in the Nistru river basin, 20-30 m above the sea level within the populated area and up to 130 m above the sea level of the community's lands.

### **Local governance**

Palanca 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.

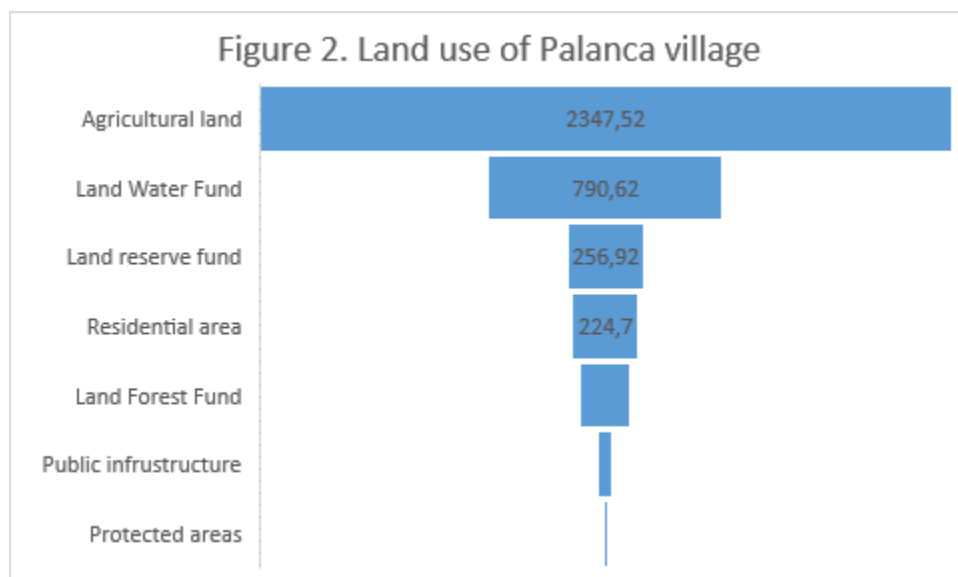
### **Population**

Population of Palanca is about 2,020 people, 48% of women, 52 % men. According to official data around 8% of population work abroad. The population density 16 pers/km<sup>2</sup>. The majority of local population (95,5%) are Moldovans, the other 5% are Ukrainians, Russians, Gagauz, Bulgarians, Roma and other nationalities. The main confession is Christian religion. During the last five years the number of births is increasing but the population of the village is constantly decreasing (see fig.1).



## Area

The total area of the community is 3939,71 ha, out of which 2347,52 ha are used for agriculture. Currently there is no agricultural land are irrigated. The majority of territory is used for yearly crops; multiannual plantations have a share less than 10%. Another 10% of the territory is afforested, and having different owners. There is no reported uncultivated land. Soils have good production potential but the erosion processes are being developed fast during the last decade. The land use of village Palanca is presented on Figure 2.



## Economic activities

According to the official data there are 23 local business entities, out of which nine are the agricultural business companies. SA "Paltira-Agro" is the biggest economic agent, managing 1827 of agricultural land,

they do have the biggest share on the district level of cereals yield. This company has rented 90% of personal land from the population of Palanca village. The main types of economic activities are as follows:

- Agriculture: cereals;
- Agriculture: vegetables
- Services

### Natural resources

The main source of drinking water is from wells, there are 289 of wells on the territory of Palanca. Local Public authorities do own one artificial lake with the surface of 430 ha, water is used for agriculture. Soils do have high yield power, unless the erosion processes are expanding. There are wetlands along Nistru river with wide biological diversity especially in that areas.

### Social security and community infrastructure

Palanca village encounters 745 households. There is one secondary school in the locality with approximately 640 places available with up to 160 pupils studying as per 2014 data. There is a kindergarten for pre-school children. Public water supply was building delivering water from three deep water wells to 594 households (80%). There is no centralized sewerage system, public buildings and some households do have stand-alone systems.

### Regional climate and climate trends

For generation of future climate projections and climate risks scientists have used for the Southern 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 South 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”.

**On the whole, the South Zone is expected to face warmer and wetter winters but hotter and drier summers and autumns.** Between 2010 and 2039, temperatures are expected to increase by 1.6 to 2.1°C<sup>1</sup>, and between 2040 and 2069, the increase will be from 2.3 to 2.9°C, on average. Along with warming, a slight annual fall in average precipitation is expected. The South Zone expects maximum warming in summer and winter. Moderate increases in precipitation are expected in winter and spring, while summer and autumn precipitation trends are mainly negative.

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. Projections for Europe more generally indicate that the risk of floods increases in Northern, Central and Eastern Europe and that today's 100-year droughts will return every 50 years (or less) in southern and south-eastern Europe (including Moldova).

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<sup>1</sup> Here and hereinafter the first temperature number corresponds to the output from the B1 and A2 scenarios.



***“The climate aridization process may accelerate considerably in the future. Currently, South Zone of Moldova is characterized by a semi-arid climate. Aridization, which leads to increased incidence of drought, is predicted to intensify noticeably as early as by the 2040s as compared with the period of 1961-1990. Aridity will be more pronounced during June to October during the plant vegetation period”***<sup>2</sup>.

### **Main climate risks and threats**

The climate of Stefan Voda district, as the whole country is moderate continental, characterized by mild winters and short and warm and long lasting summers. There are positive aspects of current climate, namely: long summers, warm, mild and sunny winters but there are negative aspects as well: frequent droughts and weather variability.

The average annual air temperature in Stefan Voda district is +9,6°C during last thirty years. During the period of instrumental observations lowest air temperature was recorded -25,3°C, while the highest - +41,1°C.

The territory of Stefan Voda, as the whole country, is part of the insufficient humidity. The annual rainfall is 526 mm. But amounts can vary from 302 mm to 739 mm. The maximum amount of rainfall recorded in 24 hours was 126 mm.

This territory is the subject to usual heavy rains. Heavy rains of long duration (≥120 mm timp de ≤3 zile) occur almost on an annual basis. Orth winds are prevailing, with an average annual wind speed equal to 2.7 m / s and maximum recorded reached 34 m/s.

Monthly and annual multi-annual data for the last thirty years are shown in the table 1 below.

Table. 1

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
The average monthly air temperature, °C												
-2,9	-1,8	2,3	9,6	15,6	19,5	21,5	21,0	16,3	10,1	4,1	-0,3	9,6
The absolute maximum air temperature, °C												
14,0	21,6	25,0	31,0	37,0	36,8	41,1	39,5	33,9	30,0	23,8	16,0	41,1
The absolute minimum air temperature, °C												
-25,3	-24,6	-16,3	-5,5	0,8	5,6	9,0	6,8	-1,5	-7,3	-15,5	-24,3	25,3
The average monthly amount of precipitation, mm												
33	36	32	37	50	65	65	52	48	28	40	40	526
Maximum daily precipitation, mm												
31	28	70	48	50	61	126	105	73	53	35	44	126
Maximum wind speed, m/s												
33	31	32	34	29	29	27	28	28	29	30	34	34

Data from the meteorological station located near Palanca show an increase in mean annual temperature and a drop in mean annual precipitation from 1990 to 2010:

- Average annual temperatures have increased by approximately 0.80C.
- Average precipitation decreased by 19.6 mm, or circa 3.6%.

<sup>2</sup> National Adaptation Strategy for the Republic of Moldova

Palanca will face warmer and wetter winters 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. Climate aridization process is also expected to accelerate considerably in the future

Climate change is generally expected to decrease the supply of water during the growing season, while concurrently increasing water demand. The benefits of warmer temperatures and a longer growing season will be limited if adequate water were not available. Climate change is expected to bring advantages and disadvantages for agriculture in Palanca. Warmer temperatures will increase the length of the growing season, but will also increase the risk of crop damage due to heat stress, changes in precipitation patterns, and pests. Model projections and observations suggest that warming would be greatest during the summer months, leading to more frequent extremely hot days, with an impact on crops and human health drought and extreme heat may also affect livestock operations.

## **Risk assessment and problems identification**

Palanca is highly vulnerable to the climate related hazards. Based on the assessment, five major risks related to climate change in Palanca have been identified and should be considered as high priority for management efforts:

- Increased risk of drought and water scarcity,
- Increased irrigation requirements,
- Soil erosion and desertification,
- Deterioration of conditions for livestock production, and
- Increased risk of agricultural pests, diseases, weeds.

The review confirms that flood, drought and severe weather conditions (heavy rainfall, heavy rainfall with hail) have been the major source of disaster damage from 1997 to mid-2016. At the same time, Palanca is located in an area of Moldova with high seismic risk, although no earthquake damage was noted during the period for which disaster data is available.

Although there were no reported seismic events in the last 14.5 years, Palanca can be considered at high risk of seismic damage. The village is located in the area of Moldova subject to a seismic event intensity of 6 or above on the Medvedev-Sponheuer-Karnik (MSK) scale. A MSK 6 scale event is considered to be “strong” and result in “damage to houses, chimneys” (see <http://geology.about.com/od/quakemags/a/MSK-Earthquake-Scale.htm>).

Main problems, identified in the participatory manner and based on the historical events are as follows and are to be addressed within the proposed plan.

1. **Fires:** recent events happened in 2009, 2014, 2015 in forest protection belts, along the public roads.
2. **Flooding:** the major events happened in 2008, 2010 due to the high water in the Nistru river. Recent year flashfloods as a consequences of heavy rains also bring the damage. Ten houses, one building from the border service and part of the road from Ukrainian side can be directly affected in case of

flood. Additionally to that in case of flooding caused by river around 510 hectares of agricultural land will be under the water.

3. **Hail:** due to the climate change this phenomena is affecting the locality on the regular basis. Both agricultural lands and residential sector can be damaged. There is no Anti-hail service, people are not using anti-hail nets and the insurance schemes are not available for local population.
4. **Droughts** are becoming more often last decade. The most recent drought that affected Palana happened in 2011, 2012 that negatively resulted in the low income of the population.
5. **Road accidents:** being located near the national level road there are accidents happening and people are affected by the high level noise from that road.
6. **Contamination:** there is no centralized water treatment facility and sewerage system in the locality.

### **Main directions of climate change adaptation**

To introduce climate change adaptation and mitigation measures three strategic objectives are identified:

Strategic objective 1: Biodiversity conservation

Strategic objective 2: Developing the adaptation potential in the priority sectors

Strategic objective 3: Raising the capacities of administrative staff in environment and climate change that will ensure the efficient implementation of adaptation measures on the local level.

For achieving each of the objectives a comprehensive list of measures have been identified. All measures, responsible actors, tentative budget are presented in **Annex 1** to this document. Implication of main stakeholders from local level: LPA, NGOs, local business, state institutions is crucial for achieving the tangible result.

The Action plan also identifies for the majority of activities tentative budget, implementation period responsible stakeholders and proposed financial resources on local/national level. The plan will be reviewed and adjusted on the annual basis to reflect the changes that can come and to monitor the implementation arrangement.

### **Conclusions**

Palanca village, being located along the Nistru river and having agriculture as the main share in the local economy is highly vulnerable to climate change. Only systematic approach targeting the problems, raising capacities of the local governments to face coming challenges can bring in new opportunities for development.

This climate change adaptation plan provides a framework and a guidance for the local community on actions to be implemented for reducing vulnerabilities by incorporating the adaptation measures into development process. This document and the process being a pilot in the country can be replicated and in other localities.

## Annex 1. The Climate Adaptation Action Plan for the Period 2017-2022<sup>3</sup>

Programme	Activities/Proposed projects	Period of implementation	Responsible	Budget	Potential financial resources
Strategic objective 1: Biodiversity conservation					
Strengthening the resilience of natural ecosystems to the climate change risks (mitigation and adaptation)	Developing irrigation system in green public areas (parks, squares, etc.)	2017-2022	LPA Palanca	18,000.00	LPA
	Planting drought resistance species.	2017-2022	LPA Palanca	20,000.00	LPA, State Agency MoldSilva
	Developing agriculture irrigation systems	2019-2020	Local business	600,000.00	IFAD
	Planting forest protection belts	2017-2022	LPA Palanca	120,000.00	LPA, State Agency MoldSilva
	Providing consultations for population about pest management	2017-2022	LPA Palanca Consultant ACSA		LPA
	Procurement of disinfection equipment	2017-2022	LPA Palanca	450,000.00	Ecological Fund
	Adjusting the number of wild animals (wolves, hedgehogs, foxes, ect.)	2017-2020	Ecological Fund Hunter's association		Ministry of Environment
	Establishing the cooperation mechanism with the specialized services (border police, hunters and	2017-2022	LPA Palanca		

<sup>3</sup> All proposed measures will be implemented in a full compliance with the Law on the Environmental Impact Assessment (currently under the approval in the Government) and will be a subject to the correspondent procedures.

	fishers association)				
	Clean apiculture development	2017-2022	LPA Palanca Local business		State Budget
	Stocking Nistru river with fish	2017-2022	Ministry of Environment		State Budget Ecological Fund
	Maintain and repair as required drainage channels and pumping stations	2017-2022	LPA Palanca Local business	1,200,000.00	Ecological Fund IFAD
	Restoration of the water pumping station from Nistru river	2017-2022	State Agency „Technological station”	560,000.00	Agency „Moldovan Waters”
Strategic objective 2: Developing the adaptation potential in the priority sectors					
Developing the resilience and adaptation potential for the water sector	Elaboration of the Action Plan for resolving the problems in the water management sector	2017-2022	LPA Palanca	2,000.00	LPA Palanca
	Building the sewage system	2017-2022	LPA Palanca	23,000,000.00	LPA Palanca Ecological Fund Local citizens
	Reusing the treated water in the agriculture	2017-2022	LPA Palanca		
	Rainfall accumulation facilities	2017-2020	LPA Palanca Local business	70,000,000.00	External resources
	Raising awareness of population on the efficient use of water	2017-2022	LPA Palanca Administration of secondary school Palanca NGOs	1,500.00	LPA Palanca NGOs
	Cleaning and arrangement of village wells	2017-2022	LPA Palanca	10,000.00	LPA Palanca Local citizens
	Certification of local wells	2018	LPA Palanca	3,000.00	LPA Palanca

Developing the resilience and adaptation potential for the soil and waste management	Creation of community service	2018-2019	LPA Palanca		
	Raising awareness of local farmers in the changes in soil and waste management in light of climate change	2016	LPA Palanca Coordinator ACSA		ACSA
	Providing recommendations for improving of soil quality, based on analysis performed by the specialized institute N. Dimo on the area of 2683 ha.	2020	LPA Palanca Local business		Local business
	Renovation of soil protection forest belts on the area 28 ha	Annually	State Agency Moldsilva		ICAS
	Elaboration of the vegetation fire-protection plan	2017	LPA Palanca		
	Ensuring the crop rotation and using conservation agricultural technologies.	Annually	Local business		
	Land decontamination from obsolete pesticides around the former pesticides storage (0,2 ha)	2017-2020	LPA Palanca NGOs	150,000.00	LPA Palanca
	Cultivation of the land being used as an open pit (approximately 2,5 ha)	2020	LPA Palanca	400,000.00	Ecological Fund
	Raising awareness of local population in separate waste collection system	Annually	LPA Palanca	2,500.00	NGO

	Establishing the composting of plant residues and biological waste from local public institutions	2019	LPA Palanca Heads of institutions		
	Creation of legal landfill on the territory of 1 ha.	2018-2020	LPA Palanca	18,000.00	LPA Palanca
Strategic objective 3: Raising the capacities of administrative staff in environment and climate change that will ensure the efficient implementation of adaptation measures on the local level.					
Ensure the implementation of Administrative Capacities Development Plan for the years 2016-2020	Elaborated Urban development plan, Land amelioration plan.	2019-2020	LPA Palanca		World Bank
	Developing the capacities of management of exceptional situations	Annually	LPA Palanca Civil Protection and Emergency Situations Service	5,000.00	Civil Protection and Emergency Situations Service Local Public Authorities
	Taking part in capacity building trainings to obtain projects that support climate change adaptation measures.	Annually	LPA Palanca	8,000.00	Local Public Authorities
	Flood risk management plan for community	2017	LPA Palanca		
	Feasibility study for implementation of energy efficiency measures	2018-2020	LPA Palanca Energy Efficient Agency	40,000.00	Energy Efficient Agency
	Risk reduction measures: drought,	2016-2020	LPA Palanca		

	flooding, landslides to introduce into the local development plans		Local business		
	Passport livestock and create the database.	2017			
	Applying penalty charges for uncontrolled waste storage and storage monitoring areas of illegal stocking.	Annual	LPA Palanca		
	Develop awareness raising programs for deepen the understanding of energy efficiency benefits.	2017-2020	LPA Palanca		
	Raising public awareness on the consequences caused by climate change.	2018-2020	Local business		