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COMMUNITY-LEVEL CLIMATE RISK MANAGEMENT IN TAJIKISTAN

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Vulnerability to Climate Change

According to the World Bank report (2009), Tajikistan is the country most vulnerable to climate change in the region and having the least capacity to adapt.

This is due to the high dependence of agriculture on rainfall in the irrigation period, high levels of environmental degradation, land erosion, deforestation rates, as well as the social infrastructure destruction.

The population is heavily dependent on natural resources (75% of population gain income from agricultural activities);

- High food vulnerability (2/3 of the agricultural production depends on irrigation, 55% of grain crops are rain-fed);

According to the Ministry of Agriculture, the annual Tajikistan gross agricultural output losses due to natural hydrometeorological phenomena equal to 1/3 of all losses.



Impact Consequences

The consequences of adverse climate impact include:

- floods in the Kafirnigan (2009, 2012) and Vakhsh basins;
- desert spread to fertile lands;
- fertile land washout due to rainfall intensity (2009);
- water scarcity resulting from the seasonal rainfall decrease caused by droughts (2000, 2007);
- crop failure due to heat waves (2011) and frosts (2008, 2011/2012);
- ground water level change;
- soil fertility deterioration.

•The worst adverse effects can be observed in the dryland farming and on grazings.:

All these factors together with natural disasters impact the crop level, reduce income, increase the risks of crop loss and farmers' bankruptcy with respect to investors, lead to the migration, and influence poverty level as a whole.

- **The estimated profit lost due to the land degradation and its unsuitability for farming operations amounted to MUS\$ 442, or 7.8% of the GDP in 2010.**
- **Annual losses from natural disasters account for 3.7% of the GDP.**



Vulnerability and Climate Risk Analysis

- Performed in Tajikistan by WB, CARE, PPCR, UNDP
- Basic concepts:
 - Vulnerability** = f (Exposure, Sensitivity, Adaptation Potential)
 - Risk** = Danger x Vulnerability / Potential

Different tools and methods are used:

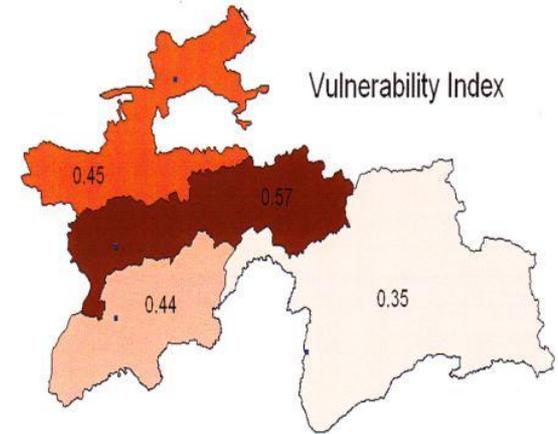
- Assessing social vulnerability
- Assessing natural disaster impact on sectors
- Assessing damage from climate-dependent natural disasters
- Assessing risks using models and statistics
- Scientific data
- Delphi method

- These evaluations are made for economy sectors and entire districts, however, there are not many assessments performed **at the community level**, as the community approach methods and tools are not employed; they remain little-known or not recognized at all.

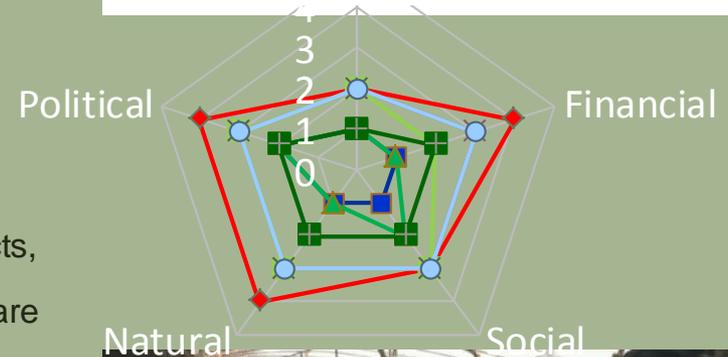
- **Community evaluation methods** allow to identify the groups seriously impacted by climate change, and to determine the major adaptation needs. They use:

- PRA, participatory vulnerability community assessment (PVCA) methods
- Needs assessment
- Cause and effect analysis
- Social maps
- Seasonal calendars,
- Local knowledge on weather and climate

Fig. 3.7: Tajikistan Vulnerability Map (regional level)



Source: World Bank team estimates based on the data from various sources



Why the Community Approach is Important?

- Tajikistan supported by CIF is implementing the large-scale national Pilot Program for Climate Resilience (PPCR). Currently, the budget of the Pilot Program for Climate Resilience increased from MUSD 50 to MUSD 130 and was replenished through additional investments from CIF, IDA and GEF. This Program may set the pattern for other pilot countries implementing PPCR, and its positive experience may be considered for the purpose of the PPCR development in the Central Asia region.
- The lack of local assessments (vulnerability assessments, climate risks assessments) of households' and communities' capacity to respond to the adverse climate change effects is being felt in PPCR.
- NGOs may substantially contribute to the local adaptation opportunities and bring the attention of researchers and politicians to the local needs.
- **It is necessary to ensure that the actual needs and interests of vulnerable communities are properly considered in the course of adaptation planning, so that poor people do not get lost in a whirl of integrated exercises, comprehensive assessment models, big money and national adaptation strategies.**



Community-Level Climate Risk Management

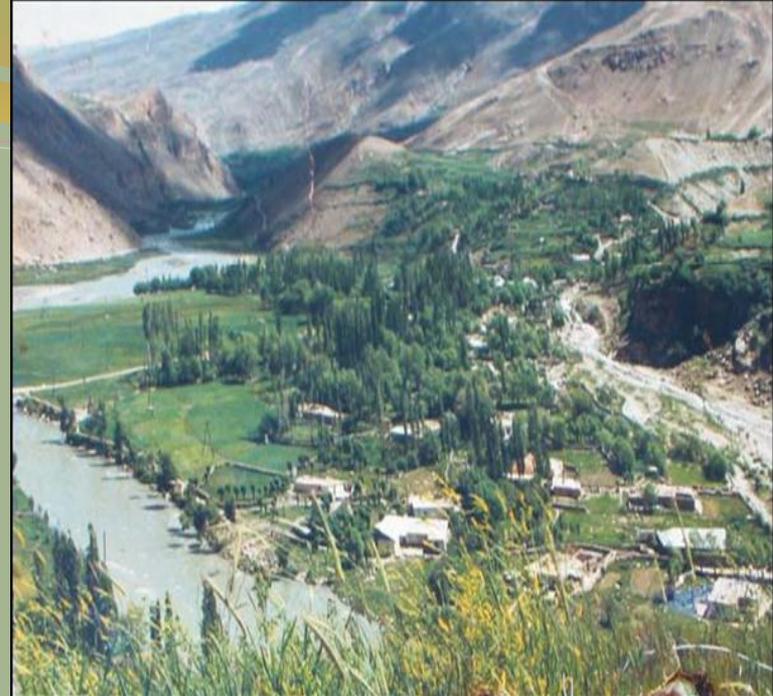
Demand for the Community-Level Climate Risk Management:

- In the Republic of Tajikistan, the agricultural production and land use were transferred from large collective farms to personal property;
- The tendency towards increasing land-poor farms and household plots;
- A half of households with the increased food security risk are headed by women;
- High risks of impacting the traditional lifestyle and poverty of communities, risks of conflicts and migration.

The risk management system as an adaptation strategy component provides for developing the households' (especially poor ones) capacity to withstand the increasing risks related to climate change (WB).

It includes:

- Multilevel adaptation measures and action plans
- Elaborating disaster preparedness programs
- Developing social assistance and insurance programs
- Improving the access to funding resources



Community Approach: Climate Risk Management Practice and Climate Change Adaptation

Fundamentals of adaptation activities:

- **Participatory approach** based on the partnership, where vulnerable groups and communities play an active role.
- Vulnerability and Risk Analysis headed by communities
- Integrated approach – the risk mitigation shall be integrated into the development activities (resiliency, local market development, accountable management, access to core services, etc.)
- Developing the potential of local partners (communities, local authorities)

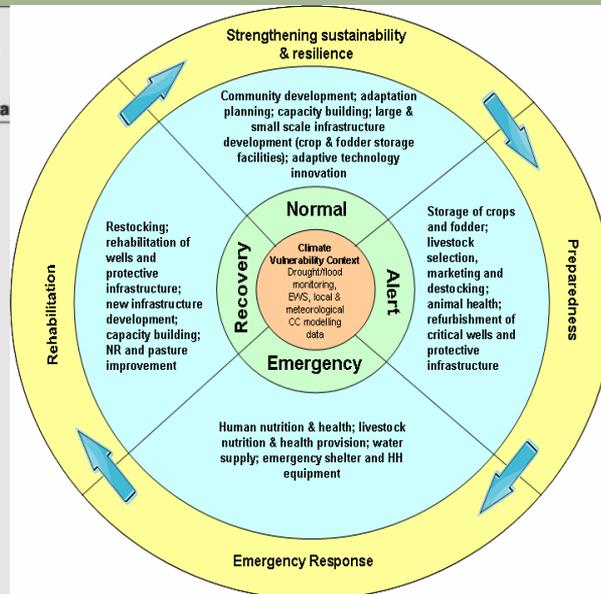


Community Approach Practice:

- Identification of vulnerable communities
- Climate risk analysis by communities
- Vulnerability assessment by communities using PVCA, PRA methods
- LAPA (Local Adaptation Plan of Action) development
- LAPA implementation and joint evaluation, benefit analysis based on the participatory approach



Местный план действий реагирования на изменение климата и стихийные бедствия



LAPA (Local Adaptation Plan of Action) Development

INCOME AND CROP PROTECTION

- Crop protection from natural hydrometeorological phenomena
- Crop protection from plant diseases and pests
- Introducing short-rain crops
- Introducing new cultivation technologies (under film, hole planting)

RESOURCE SAVING

- Improving the energy efficiency of furnaces and bakeries
- House insulation
- Energy efficient construction of public and accommodation spaces
- Efficient waste utilization, composting, briquetting

ACCESS TO ALTERNATIVE RESOURCES

- Solar, biogas, wind energy and micro HPPs
- Reducing the dependence on the centralized power supply
- Reducing the dependence on the centralized water supply
- Improving the solar energy utilization (introducing solar dryers, hothouses)

AGRICULTURAL AND BIOLOGICAL DIVERSITY PROTECTION

- Plant protection before frosts and droughts
- Plant preparation to the vegetation period
- Preserving local breeds and crops
- Community agroforestry

IMPROVING LAND RESOURCE MANAGEMENT, **LAND RESOURCE SUSTAINABLE MANAGEMENT**

- Control over soil erosion and salinization, improving soil fertility
- Improving land use (agricultural technologies, benching)
- Introducing money-saving irrigation methods, water collection

EMERGENCY RISK MITIGATION



LAPA is Supplemented with Actions Improving the Social and Economic Situation

- Social and economic situation improvement, eradication of poverty and unemployment
- Sanitation services access improvement
- Drinking water access improvement
- Education potential increase
- Health of domestic animals



LAPA Develops the Local Self Government Potential

- Creating SHPs (self-help groups)
- Creating saving funds
- Creating emergency preparedness community groups
- Developing agricultural insurance
- Developing management potential



**Important: Participatory monitoring and
evaluation of the benefits from the
implementation of LAPA**



Analysis of Benefits from Adaptation Measures

- Economic benefits (1 km of drainage reduces the salinity of 30 ha and increases the crop yield by 15-20%)
- Social benefits (for instance, the employment of women increases)
- Environmental benefits (soil protection from washing out)

Principles of Adaptation Measures and Technologies for LAPA

- contributing to poverty reduction
- based on the participatory approach
- inexpensive, cost-effective
- based on the local experience
- easy to pattern after



LAPA is Accompanied by Community Training at Master Classes and Workshops

- Methods of plant protection from drought
- Fighting plant diseases (biomethods and bioinsecticides)
- Methods of preparation to the vegetation period, grafting
- Introducing short-rain crops
- Introducing money-saving irrigation methods
- Hothouse facilities
- Organic farming fundamentals
- Energy efficient construction
- Safe crop storage
- Using alternative energy sources
- **Business planning, training on financial management and reporting**



Supporting the Operations of the Small Grant Facility for Community Based Organizations, Vulnerable Groups, Farmers, Women and Youth

Funding. LAPA actions in vulnerable communities gain funding. Actions are presented in the form of business plans.

Income-Bringing Mechanisms. LAPA comprises income-bringing components.

Contribution. LAPA is based on the community contribution amounting to at least 30%.

Saving funds. Saving funds receiving a part of the profit (10-15%) from businesses are created.

Gender. Supporting women's income-bringing and adaptation mini projects is a priority.

Insurance Seed Funds. Seed funds with a returnable mechanism are created in groups.

Management. A tender committee comprising representatives of the community and local authorities, CBO/gender balance

Monitoring. Based on the participatory approach



Access to Information on Climate Change Risks and Adaptation Measures

- Establishing **community centers** for climate change adaptation (on CBOs)
- Creating **demonstration plots** for farmers, introducing adaptation techniques among farmers (each district)
- **Workshops** on adaptation measures for farmers and consultations in the field
- **Focus group discussions and** workshops, seminars to build the capacity for business planning, land rights and access to the market



Adaptation Practices

Picture of Youth EcoCentre's Community-Level Climate Risk Management project
in south-west Tajikistan



Improving Soil Fertility

The most successful sustainable land resource management practices employed by farmers under the climatic stress conditions are the application of inexpensive and accessible methods of soil fertility improvement as follows:

- **Introducing break crops** or 'green manures' (cultivating annual plants in order to form humus in soil)
- **Using microorganisms** (cultivating aerobic bacteria and microorganisms of local population – nodule and nitrogen-gathering bacteria based on lucerne, chickpea and pea roots)
- **Mulching** (applying organic remains to inter-rows)
- **Composting** – applying nutrients
- **Low till** ('zero tillage')
- **Dressing with liquid solutions** (sharbat irrigation)
- **Applying lake and ditch slit to soil**



Zero Tillage. Nosiri-Khisrav District

- Reducing costs
- Increasing humus layer
- Retaining moisture in soil
- Preventing wind erosion



Fighting Soil Salinization. Nosiri-Khisrav District

- Deep tillage, leaching, check flooding
- Planting salt-tolerant crops
- Biodrainage



Retaining Moisture in Soil

In the arid climate, farmers employ the methods ensuring the retention of moisture and temperature conditions through:

- **Mulching:** applying organic remains to inter-rows
- **Parceling:** deep tillage in autumn and 'coverage' in spring
- **Atmospheric irrigation**
- **Creating trenches**
- **Moisture supply (yakhobs)**
- Distinctive agricultural methods:
 - **hole planting**
 - **planting under straw**
 - **inter-row** (potatoes, oats) and compound (potatoes, radishes) crops
- **Polyethylene coverage** - planting under film (potatoes, watermelons, melons)



Crop Protection from Natural Hydrometeorological Phenomena. Cultivating Potatoes under Film. Beshkapa, Nosiri-Khisrav District



Efficient Irrigation Methods. Sharbat Irrigation. Youth EcoCentre Demonstration Plot

Irrigation with enrichment





A Bin for Irrigation with
Enrichment

**Drip Irrigation Using Basic
Technologies
Nosiri-Khisrav District**



Drip Irrigation and Watering with Flasks.

YEC Demonstration Plot



Moisture Retention Methods. Almond Cultivation Through Hole Planting in Kabodiyen and Grape Growing Using Trenches in Gissar



Hole Planting Agricultural Technology for Cultivating Crops in Arid Areas. Nosiri-Khisrav District



Different Types of Dryers. YEC Demonstration Plot



Different Types of Furnaces. YEC Demonstration Plot, Beshkapa



Solar Water Heater Production



Hothouse Facility. YEC Demonstration Plot in Kabodiyen







Sprinkling and Drip Irrigation in Hothouses.

YEC Demonstration Plot, Shartuz



Energy Efficient Furnaces. Birlyash, Shartuz



- **IISC-Based Energy Efficient Furnaces (Nepal Technology), Shartuz**



Before and After Shartuz District



- **RECOMMENDATIONS:**
- The climate risk and vulnerability assessment by communities allows to settle the issue with the population involvement in adaptation programs, and to provide the most **adequate response** to climate threats and adaptation needs.
- In order to increase the efficiency, the Climate Risk Management (CRM) Actions shall be **integrated** into the Community Plans, rural areas development plans and be headed by communities themselves.
- The CRM Actions shall be implemented **simultaneously** with measures on the land resources protection, crop protection and storage, local agricultural and biological diversity protection, local energy and water issues resolution, and emergency risk mitigation.
- As the agricultural production and land use are transferred from large collective farms to personal property, the adaptation practice shall be targeted to **small farms**, major food producers and poor communities.
- The interrelation between the **gender policy** and climate change adaptation shall be considered, as women largely depend on natural resources, and the substantial part of vulnerable households are headed by women.



THANKS FOR YOUR ATTENTION!

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Photo: Tajikistan, Nosiri-Khusrav District, onion field