Ministry of Ecology and Natural Resources of the Republic of Azerbaijan

CTCN CLIMATE TECHNOLOGY CENTRE & NETWORK

UN environment

eurac research

Protocol Meetings in Baku, 11-12 July 2019

CTCN Technical Assistance Azerbaijan

Strengthening Capacities to Assess Climate Change Vulnerability and Impacts to Shape Investments in Adaptation Technology for Azerbaijan's Mountain Regions

WORKSHOP AGENDA

Baku, Ganjali Plaza Hotel, 11/07/2019

Workshop objectives:

- Provide an overview over ongoing activities and information on climate change and climate change adaptation in Azerbaijan's mountain regions
  - Existing risk assessments
  - Responsibilities in the agriculture & water sectors
- Build impact chains
  - Impacts and risks – Which are the most relevant climate-related impacts and risks for the water and agriculture sectors in Azerbaijan's mountain regions that can already be observed?
    - Water sector (floods and damage due to floods, water scarcity (for irrigation & drinking water), water quality, …)
    - Agriculture sector (drought in rain-fed & irrigated agriculture, pest and diseases, damage due to high temperatures, overgrazing / high livestock density, ...)
  - Which factors lead to high vulnerability and / or high exposure to climate related impacts and risks?
    - Water sector (condition of water infrastructure, increasing demand, …)
    - Agriculture sector (high vulnerability of farmers due to low income, condition of irrigation system, climate-sensitive crops, …)
- Check data availability
  - Climate data and climate scenarios, long-term station data, observed trends and extremes, climate scenarios
  - Non-climatic data (agriculture survey, water infrastructure, population density, livestock density, …).

AGENDA

Time	Duration	Topic	Content and guiding questions	Responsible
9:00	9.30	Registration		
9:30	9.40	Welcome and introduction introduction round of participants	Agenda, workshop objectives, selection of target sectors and regions Introduction round (Institution, Relation to climate risk and adaptation)	MENR
9:40	9.55	Project background / rationale		Matthias Jurek / UN Environment
9:55	10.10	Presentation of CRVA method		Marc Zebisch / Eurac
10:10	10.20	Climate data and scenarios	Which climate extremes and climate impacts can already be observed in Azerbaijan's mountains? Which potential future impacts are expected due to climate change? Which data are available?	
10:20	10.30	Climate change in agriculture and water sectors		Isa Aliyev / consultant
10:30	10:40	Natural hazards & disaster risks (focus on mountain regions)		Rahimov/National Academy of Sciences/
10:40	10:50	Impact of climate extremes to pasture areas		Rasib Zeynalov/ Ministry of Agriculture
10:50	11:10			
11:10	12:00	Discussion on hazards, impacts and risks	- Discuss key questions (print out) - Collecting answers on Pin board (Hazard, impact, vulnerability, exposure) and maps	All participants
12:00	12:30	Clustering and structuring impacts	- use red-dots to identify most relevant impacts and risks	All participants
12:30	13:30			
13:30	15:30	Agriculture impacts and interventions	- Build impact chains	All participants
		Water impacts and interventions	- Build impact chains	All participants
15:30	15:50			
15:50	16:30	Review of impact chains and assessment of high risks		All participants
16:30		End of workshop / closing		MENR

Welcome and introduction

Welcome remarks from Ceyhun Hasanov, Head of Climate Change Center, Ministry of Ecology and Natural Resources (MENR).
He highlighted the relevant impact that climate change is having also in Azerbaijan with increase of temperatures, floods, heavy rainfalls and droughts.
The Ministry of Ecology and Natural Resources Republic of Azerbaijan signed the United Nations Framework Convention on Climate Change (UNFCCC) and it's reporting under it. The Government has already developed and submitted to the UNFCCC its First, Second and Third National Communications in 2001, 2010 and 2016 respectively.
He invited all participants to be actively engaged within the workshop

Introduction round of participants

Introduction round (Institutions, Relation to climate risk and adaptation)

Project background / rationale

Matthias Jurek, Programme Officer, UN Environment Vienna Office, presented the UN Environment's work on mountain ecosystems and, more specifically, the regional cooperation in the Caucasus Mountains. A series of Mountain Adaptation Outlooks have been developed by UN Environment, among which the Outlook on Climate Change Adaptation in the South Caucasus Mountains. The Outlook shows that annual temperatures are increasing accompanied by severe heat waves and droughts. More extreme weather events, such as heavy rains and unusual hail storms, and changes in precipitation patterns are also linked to climate change. Human casualties, damage to infrastructure and economic losses are increasing due to intensifying natural disasters such as floods, landslides and mudslides. In the region, most natural disasters occur in the mountains, which cover the largest territory of the South Caucasus. These disasters threaten not only mountain inhabitants and critical infrastructure but also people living in the lowlands.

In 2016, the Ministry of Ecology and Natural Resources (MENR) of Azerbaijan submitted a Technical Assistance (TA) request to the Climate Technology Centre and Network (CTCN) on "Strengthening Capacities to Assess Climate Change Vulnerability and Impacts to Shape Investments in Adaptation Technology for Azerbaijan's Mountain Regions". The CTCN is the operational arm of the UNFCCC Technology Mechanism, hosted by the UN Environment Programme and the UN Industrial Development Organization (UNIDO).
The CTCN agreed to work with UN Environment and Eurac Research, an Italian Research Centre and network member of CTCN, on the implementation of the Technical Assistance.

The first step in the implementation of the TA is the development of a set of quantitative Vulnerability Impact Assessment (VIA) indicators (10 - 20 indicators per sector) for the measurement of climate change impacts, risks and vulnerability for priority sectors (water and agriculture) for the use in mountain regions of Azerbaijan based on consultations with relevant national and local stakeholders from the public and private sector. The VIA indicators will be developed for the use by the national and local governmental institutions responsible for climate change and adaptation in Azerbaijan (e.g. the Ministry of Ecology and Natural Resources), as well as sectoral governmental bodies (final list of indicator users tbd depending on the sector selected) and other relevant stakeholders from the public and private sector.

Indicators are tested in a selected pilot mountain region (Ismailli or Shemakhi) and priority sectors in Azerbaijan through the conduction of a vulnerability study.
Result expected: Strengthened capacity of relevant stakeholders on analysing VIA information and utilizing this knowledge to shape meaningful investment decisions by public and private sector.

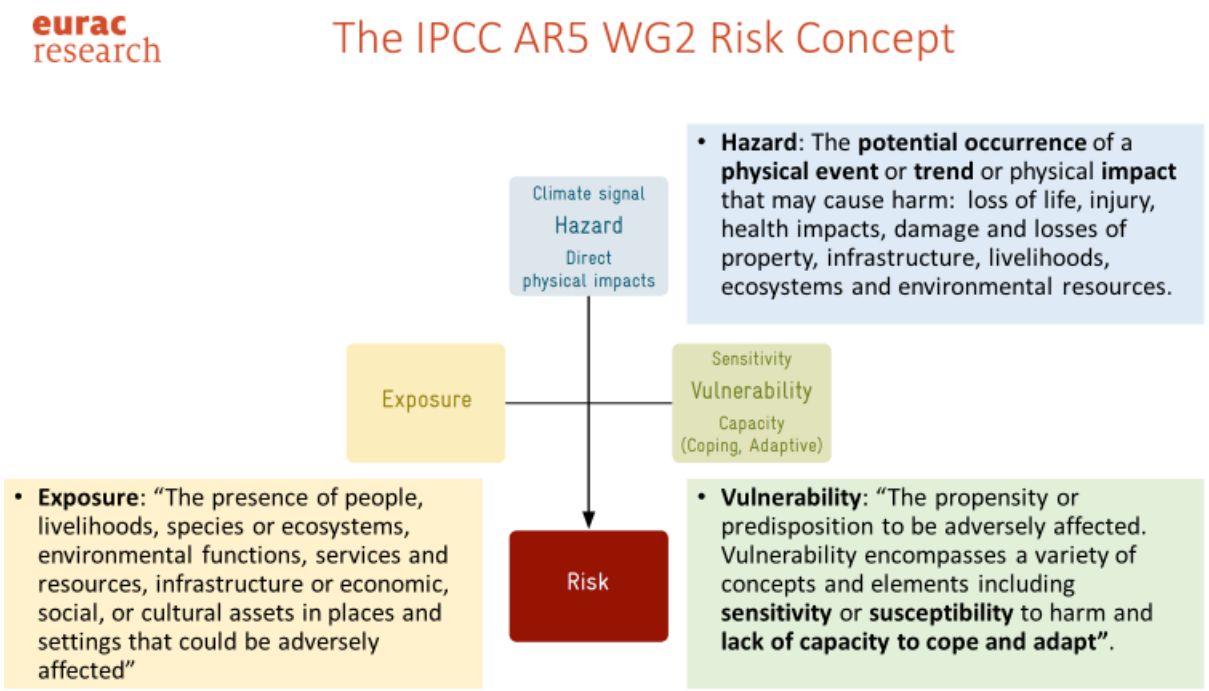
Planned Deliverables:

Deliverables	**Delivery date**
Organized internal kick off (virtual) meeting with project team (incl. Azerbaijan counterparts) to discuss and agree on roles & responsibilities and implementation of work	1th April 2019 (Week 6) **(done)**
List of key stakeholders to be involved in the development of indicators	29th April 2019 (Week 10) **(done)**
1st stakeholder meeting in targeted mountain municipality convened	July 2019 (Week 16) **(meeting in Baku, 11 July 2019)**
Elaborated list of indicators for VIAs for one specific sector and one selected mountain pilot site (municipality level)	23nd September 2019 (Week 31)
2nd stakeholder consultation meeting (validation workshop) convened to review results obtained	11st November 2019 (Week 38) *
VIA study report for selected mountain pilot site (local/municipality level) and including an analysis of results from testing the indicators	17th February 2020 (Week 52)

*final dates pending confirmation by all partners

Presentation of CRVA method

Marc Zebisch, Head of the Institute for Earth Observation of Eurac Research, presented the method that will be used for the TA Implementation, also during the workshop, for Climate Risk and Vulnerability Assessment (CRVA) and how this method can contribute to enhance adaptation planning and action. The IPCC AR5 risk concept has been developed around the central term ‘risk’. In this concept, risk is a result of the interaction of vulnerability, exposure, and hazard.



Graphic.1

In order to build impact chains, during the workshop, the most relevant climate-related impacts and risks for the water and agriculture sectors in Azerbaijan's mountain regions are planned to be identified. In relation to this, factors which are leading to high vulnerability and / or high exposure to climate related impacts and risks will be agreed upon. Finally, data availability will be checked (Climate data and climate scenarios and non-climatic data).

Climate data and scenarios

Mr. Issa Aliyev, Climate Change Expert, made a presentation on "Adaptation as a crucial element of climate change for Azerbaijan". In Azerbaijan, the most vulnerable sectors identified are:

- water resources, agriculture, coastal areas, tourism
- health, forest, mountain ecosystems, alpine meadows, wetland
- natural disasters (floods, droughts, heat stress, diseases, forest fires)

Azerbaijan has already identified development priorities as part of national development strategies, poverty reduction strategies and sector policies. National adaptation strategy has been reflected in different State programmes such as:

- “Strategic roadmap on agricultural production and processing” adopted in 2016 that has specific planned climate change mitigation and adaptation actions in agriculture and LULUCF sectors.
- “State Programme on development of vine growing activities” (2012–2020);
- State Programme on poverty reduction and sustainable development (2008-2015);
- “State Programme on Ensuring Reliable Food Provision to Population” (2008–2015);
- “Azerbaijan-2020: “vision to future” Development Concept

Azerbaijan is more vulnerable to climate change because:

- The country is located approximately 28 meters below the world's ocean level on the west coast of the Caspian Sea;
- Almost half of the country's territory located in arid and semi-arid zone;
- Approximately 60% of the country's territory is composed of steep slopes mountains with altitudes of 500 m to 4000 m;
- The country has not fully provided with water resources and these resources are disproportionately distributed across the regions;
- Most of the land suitable for agriculture have rainy lands that are in the mountains;
- Most of the population, especially the rural population, have not been informed about global climate change and its negative consequences; and so on.
- The cost of inaction and the cost of adaptation (500 m-3 rayon)

The results of preliminary vulnerability assessment in Azerbaijan showed that the most vulnerable sectors to climate change are agriculture and water. Agriculture is the sector of economy which is most of all dependent on climate conditions. A slight change in climate conditions makes a considerable impact on agricultural production. Main climate change hazards are decreasing agricultural productivity due to increasing droughts. Water scarcity is due to low precipitation, damages to yields are due to heavy rainfalls, heat stresses, early frost, floods.
Water resources will be under even greater pressure in the future as a result of climate change. This is a result of three factors: the projected decrease in rainfall, increased evaporation resulting from higher temperatures, and the amplifying effect that the hydrological cycle has on climate change.

The followings are prior adaptive measures to adapt to climate change:

<u>Agricultural sector</u>
- Introduction of crop species resistant to expected climate changes
- Enhance the experience of application of windbreaks
- Application of water saving technologies, such as drop or spray irrigation
- Application of conservative cultivation technologies

Water sector
- Rainwater Collection from Ground Surfaces—small reservoirs and micro-catchments
- Flood warning systems
- Water reclamation and reuse
- Reducing water leakages in water management facilities

There are still existing barriers for deployment of adaptation technologies, such as:

- Economic/financial barriers such as high investment costs, inappropriate financial initiatives;
- Policy/regulatory barriers such as lack of stimulating mechanism;
- Technological barriers dependence on import, weak capacity of research institutions, weak technical service system
- Information/capacity barriers weak access to information, low level of awareness on economic and environmental benefits of technologies both of local population and private sector.
- Social barriers such as unfamiliarity with new technology, social of use of traditional methods so on.
- Low capacity at local level, low capacity of private stakeholders and low awareness level of local authorities and population

Natural hazards & disaster risks (focus on mountain regions)

Matlab Rahimov, National Academy of Sciences, made a presentation on "Natural hazards & disaster risks" with a focus on mountain regions showing the trend in the increase of annual temperatures. Some of his key points included:

- Climate change impact is high on mountain regions, especially the impact on natural resources
- Heat waves impact different sectors, new agro-climatic regions were formed
- In the Northwestern parts of Azerbaijan a tradition of 135 years of monitoring exist (Shaki station). Heat waves are visible in the graphs.
- Precipitation: multi-year tendency is showing decrease, Baku area: slight increase in rainfall
- Gadabay (Lesser Caucasus): 1,6°C increase; precipitation: increase
- Vegetation period / 10°C threshold starts 10 days earlier, 10-12 days longer now

Impact of climate extremes to pasture areas

Rasib Zeynalov, Ministry of Agriculture, made a presentation on the "Influence of climate extremes to pasture areas in Azerbaijan-assessment and adaptation measures"
The nature of Azerbaijan's territory is variable, which is serious for the climate change effects.
In Azerbaijan:

- Agricultural products are produced in private households;
- The per capita agricultural land area is 0.45 ha.
- Almost half of the population lives in rural areas and agriculture is the main source of income for the village farmers;

- The main agricultural zones of the country (Kur-Araz plain) are drylands, the natural low moisture reserves and water requirements of plants are provided by artificial insemination;
- Ground waters are close to the ground surface and the soil has problems with salting. For this reason, watering is carried out by drainage systems;
- The water used for agriculture and irrigation is 6.5 mld. cubic meter their share in total water is 54%.

Agricultural sector challenges:

- At present time, productivity on major agricultural crops is relatively low compared to developed countries;
- Part of the country's demand for wheat and other crops is provided through imports;
- Summer and winter pastures: livestock is basically based on natural feeding;
- Cotton and grapes are traditional products that are currently focused on increasing productivity

Key adverse effects of climate change on agriculture can be defined as follows:

- Increasing temperature and increasing number of dry days;
- Decreasing precipitation and diminishing soil moisture content;
- At the same time, rainfalls normally resulting into landslides, floods;
- Product losses in crop areas; Grapes, fruit;
- Reduced productivity in vegetables and other crops;
- Increased drought adverse effects on pastures;
- Reduction of water resources.

In 2016, a Strategic Roadmap on "Production and Processing of Agricultural Products" has been adopted;
Key points include:

- Evaluation of impacts of climate change on agriculture and preparation of adequate adaptation plan;
- Improvement of Agrometeorological Database;
- Establishing local intervention systems for weather conditions for agricultural purposes;
- Improving the legislative framework and strengthening inter-agency co-ordination;
- Transition to principles of the green economy;

Azerbaijan committed to the UN Sustainable Development Goals (2016):
Goal 13: Take urgent action to combat climate change and its impacts.
Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Below some recommendations on major directions for adaptive measures against climate change challenges in agriculture

I. Improvement of land management and land use:

- Comprehensive adoption of land consolidation in terms of rural development;
- Improving the legal framework for the co-operative organization and implementation of other institutional arrangements;
- Determination of exact areas of saline and degraded soils and complex meliorative measures;
- Expansion of reclamation of collector-drainage systems;
- Improvement of land quality monitoring system;
- Strengthen the monitoring system for the use of pastures;
- Expansion of measures for the protection of flood and flood relief of the lands and rural settlements

II. Improving water use in agriculture:

- Establishing a new generation of modern irrigation systems to prevent water losses;
- Application of advanced water-saving irrigation systems (rainfall, drops, groundwater, closed-loop systems);
- Use of alternative water sources, including rain, collector-drains;
- Improvement of management of irrigation and drainage systems; Strengthening SEUs;

III. Raising the efficiency of agriculture:

- Growing of drought and salt resistant agricultural crops; Creation and distribution of new varieties in this direction;
- Expansion of breeding work of varieties of wheat drought-resistant and high-productivity in terms of food security;
- Continue the work on cultivating the drought-resistant and high-yielding varieties of cotton;
- Development of grassy forest strips around planting areas;
- Preparation of plants such as nuts and grapes on the mountain terraces;
- Rehabilitation of tea plantations;

IV. Development of intensive plant and animal husbandry:

- Support for the creation of greenhouses that meet market needs;
- Expansion of support for the establishment of modern dairy and meat production complexes, including waste processing;

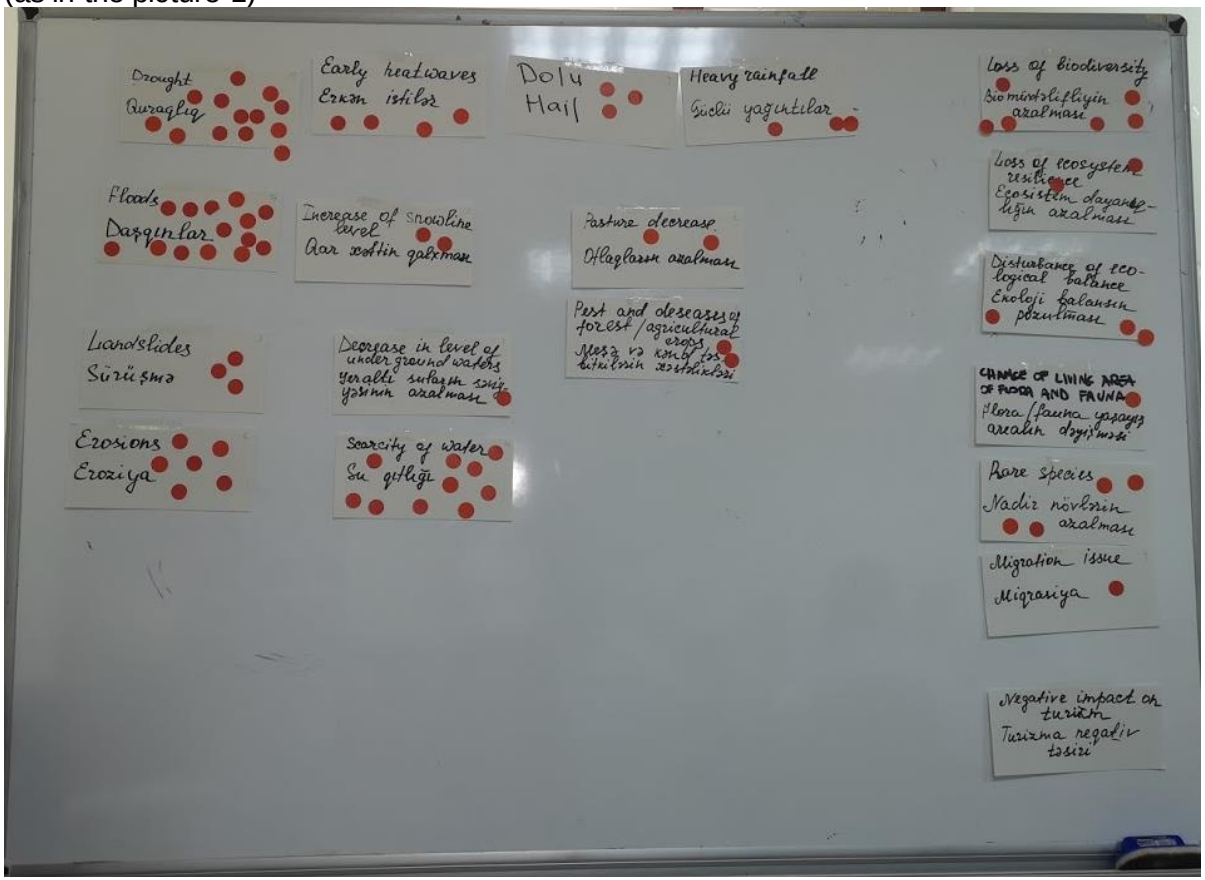
V. Expansion of scientific research and innovation application:

- Modernization of existing scientific institutions, expansion of their institutional capacities;

- Improving the training of scientific staff;
- Establishment of motivation mechanisms for achieving promising human resource potential in scientific activity;
- Cooperation with international food and catering companies and global food companies specializing in innovation;
- Launch of local projects with the Green Climate Fund and other donor organizations

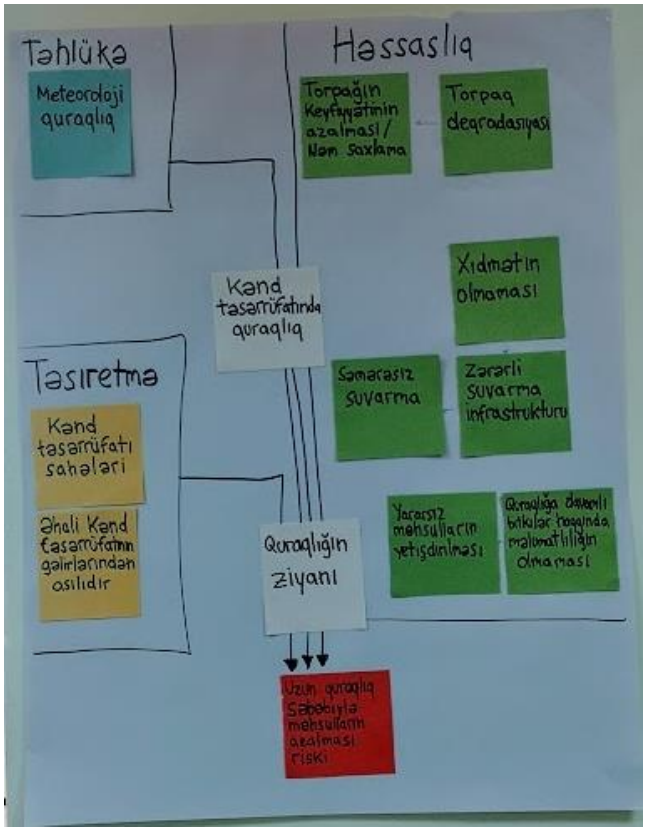
Discussion on hazards, impacts and risks -

Participants were asked to identify impacts and risks and, based on these, select the most relevant ones for Azerbaijan Mountains using red dots (as in the picture 1)



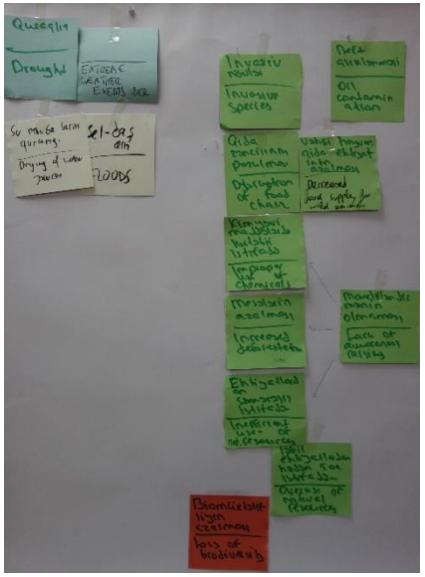
Picture 1.

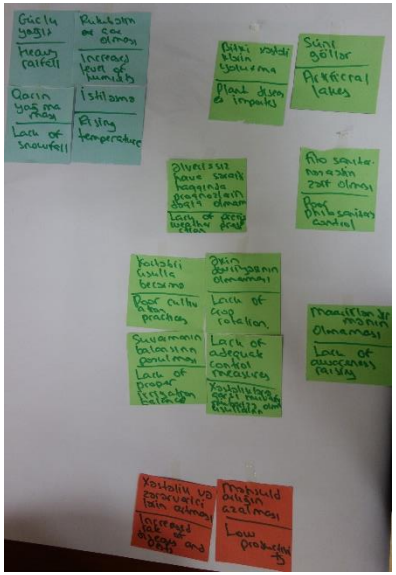
Based on the main impacts and risks identified for the water and agriculture sectors, related impact chains were built using the IPCC AR5 risk concept (Graphic.1, Picture2):



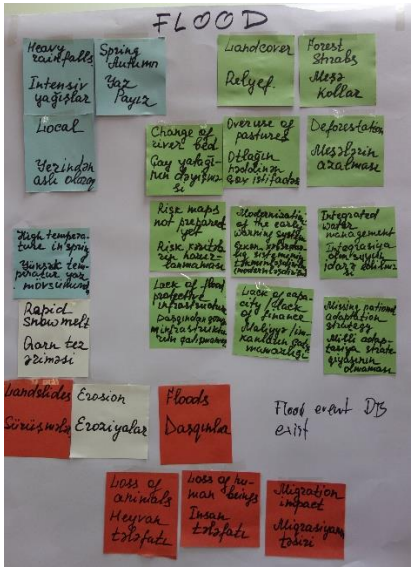
Picture 2.

Impact chains were built as follow:
For agriculture: loss of biodiversity, increased pest and diseases and low productivity, drought
For water: floods (together with loss of animals, loss of human beings, migration impact, landslides), water scarcity





Pictures 3, 4, 5: Agriculture Impact Chains on Drought, loss of biodiversity, increasing pests and diseases and low productivity



Pictures 6, 7: Impact chains on flood and water scarcity

Closure of the meeting

The impact chains developed for water and agriculture sectors were presented by the meeting participants. Marc Zebisch and Matthias Jurek informed participants about a 2nd stakeholder consultation meeting (validation workshop) convened to review results obtained, planned for Autumn 2019 and closed the meeting.

Picture 8.

Workshop Participants

#	Name, Surname	Organization	Position	Contacts
1	Ceyhun Hasanov	MENR, Climate Change Center	Head of Climate Change Center	
2	Faig Mutallimov	MENR	International Division	
3	Aygun Narimanova	MENR	International Division	
4	Asif Verdiyev	MENR, Hydromet	Deputy director	
5	Cemile Mammadova	MENR, Climate Change Center		
6	Islam Turan Karimoglu	MENR		
7	Solmaz Bayramova	MENR, Biodiversity department		
8	Sama Mammadova	Ministry of Agriculture	Division on land use, melioration, pastures	sima.mammadova@agro.gov.aztel: 012 498 94 50)
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16	Bashir Asadli	Ministry of Emergency Cases	Leading advisor	070 512 0301 adimanalili@mail.ru
17	Ruslan Salmanov	NGO, REC Caucasus Azerbaijan	Leading specialist	
18	Vusal Mirzayev	NGO, Local Governance Assistance	Director	

#	Name, Surname	Organization	Position	Contacts
19	Isa Aliyev	Climate Change expert		Issa.aliyev@gmail.com
20	Matthias Jurek	UN Environment	Programme Officer	
21	Marc Zebisch	Eurac Research	Head, Earth Observation Institute Eurac	Marc.Zebisch@eurac.edu
22	Alois Schlaeffer	Eurac Research	Expert	alois.schlaeffer@gmail.com
23	Eleonora Musco	UN Environment/Eurac Research	Expert	eleonora.musco@un.org
24	Bariz Mehdiyev		Consultant	barizali@gmail.com
25	Sahib Hasan -zada	FHN Seda		
26	Shalbuzov Fuad	FHN Seda		

Meeting with Umayra Tagiyeva, Ministry of Ecology and Natural Resources (MENR), Hydromet UNFCCC Focal point, Head of Hydromet, 12 July 2019, Baku, Azerbaijan

Presence: Ceyhun Hasanov, Bariz Mehdiyev, Marc Zebisch, Alois Schlaeffer, Matthias Jurek and Eleonora Musco

Matthias Jurek shortly presented UN Environment's Work on mountain ecosystems and, more specifically, the regional cooperation in the Caucasus Mountains and the work related to the Outlook on Climate Change Adaptation in the South Caucasus Mountains. Furthermore, he introduced the activities that will be undertaken under the CTCN Technical Assistance (TA) in Azerbaijan. The cooperation with Eurac is a first step in the implementation of the TA. In case the Ministry of Ecology is interested in continuing the cooperation, it should express and request this will to CTCN and request the continuation of the project. It would be important to nominate the new CTCN NDE for Azerbaijan.

Marc Zebisch presented the method that was used during the workshop for Climate Risk and Vulnerability Assessment (CRVA) and that will be used also in the regional workshops. He asked about two main questions: 1) availability and access to observation data and 2) experience with the Coordinated Regional Downscaling Experiment (CORDEX) program, which is sponsored by World Climate Research Program (WCRP) to develop an improved framework for generating regional-scale climate projections for impact assessment and adaptation studies worldwide within the IPCC AR5 timeline and beyond.

Ms. Umayra Tagiyeva expressed interest in the ongoing cooperation on the CTCN Technical Assistance and support in identifying data, facilitate the nomination of CTCN NDE and continue the cooperation on the Technical Assistance.

An event on climate change in Mountain Regions is planned to be organized at the next UNFCCC COP, under the leadership of UN Environment and it would be relevant to have Azerbaijan represented among the speakers.