REPORT

Agroecological Territories for Climate Action Project

Kosovo/Albania/Macedonia Part

Climate Awareness Association

January 2025

Climate Awareness Association

Podujeve Workshop

Participants :

Nine participants took part in the workshop the 6th of November 2024, representing key sectors (Annex 2):

- Water Sector of Balkala
- Fire Brigade
- Forestry Agency
- Waste Management Services
- Women Producers NGO (with 66 members)
- Ekoswomen NGO
- Raspberry Farmer
- Representative of Podujevo Municipality
- Representative from the Raspberry Collection Center (which works with 400 farmers)

The climate fresk workshop was streamlined and shortened, focusing on foundational concepts. This approach allowed time for an in-depth discussion in the afternoon workshop, where we covered the second part of the session in greater detail.

Keys findings from the workshops in Podujevo

Socio-Economic Context :

Podujevo is a municipality with a population of approximately 71,018 [1]residents as of 2024. However, **urban migration** patterns are reshaping Podujeva. Many people are moving from rural, peripheral villages into the center of Podujeva, while others migrate to Pristina or even beyond Kosovo to find employment and improved living standards. This movement reflects both a shift towards urbanization and the region's broader economic and social dynamics.

The key industries in the region, includes textiles, food and beverage processing, plastic and metal production, and energy, predominantly located on agricultural land. While these industries boost the economy, they contribute to environmental and land-use challenges. Approximately 90% of these businesses in the region are built on agricultural lands.

Tourism in the region has been developing steadily, particularly around Batllava Lake, which has become a popular destination for both locals and visitors seeking recreation and scenic views. The area also draws visitors to historical and cultural landmarks, such as the Hakif Zejnullahu complex, which holds significant cultural value. The increasing influx of visitors, especially during peak tourist seasons, highlights the growing appeal of the region's natural and cultural attractions, as well as the economic potential that tourism brings to local businesses and communities.

Touristic places in the area : Batlava lake, Walking lane, 5 walking lanes, Zahir Pajaziti Complex, Orllan, Hakif Zejnullahu Complex, Era's park, Bajgorë/ Kaçandoll, Swimming competition with Kayak, Old mills, Hertica mine

The region lacks a fully functional hospital, but one is currently under construction. For now, there is one **Healthcare center** (QKMF) providing 24-hour emergency services, alongside gynecology, palliative care, stomatology, vaccination, and laboratory services. Healthcare costs are generally affordable, ranging from €1 to €5 for most services. But, health conditions in the region are worsening, exacerbated by environmental and industrial issues, and there is growing concern over untreated water consumption and air quality.

Urban development in the region is gradually modernizing, with steps taken towards digitizing municipal services to improve accessibility and efficiency for residents. Road infrastructure is at 90% completed and there is regular public transportation to most of the villages. However, outdated infrastructure presents significant challenges. The railway system, once a viable mode of **transportation**, is now out of service, and there are limited public transport options. Cars remain the dominant form of transportation, leading to increased road congestion and limited mobility for those without access to private vehicles. While an urban traffic improvement project is in planning stages, the absence of reliable and diverse transit options limits connectivity within the region. Alternative transport modes, such as electric scooters, are restricted from key public areas like the central square.

[1] https://www.periskopi.com/podujeva-17-mije-banore-me-pak-se-ne-vitin-2011/

Geographic and natural context :

Key Geographic Features: The municipality includes varied topography, such as the Kopaonik Mountains in the west (peaking at 1,770 meters) and lower mountains to the east (up to 1,100 meters). The Llap Valley, a flat area approximately 31 km long, lies between these mountain ranges.

Water Resources: Podujevë is traversed by the Llapi River and features significant bodies of water, including Lake Batllavë (3.27 km²) and some minéral spring.River valleys, especially those of the Llap and Kaqandolli, support settlements and infrastructure development.

Land Use: Information on the proportion of artificial spaces is unspecified, though urban population density is highest in the city of Podujevë (2,635 people per km²).

Biodiversity : Managed by the Directorate of the environment in the municipality, the area supports a range of wild plants (wild raspberry) and rare wildlife, including the critically endangered Balkan lynx, which has faced illegal hunting pressures. This species, with a global population of only 30, is protected under international and national conservation laws.

Energy context :

The energy context in Podujeva, Kosovo, reflects the broader energy challenges faced across the country. Kosovo relies heavily **on coal** for electricity generation, particularly through the Kosovo A and Kosovo B power plants, which contribute significantly to the country's energy supply. However, these plants also generate considerable environmental and health impacts, as they are major sources of air pollution.

In Podujeva, as in other regions, energy consumption is mainly driven by the residential and industrial sectors, with households using electricity for heating, lighting, and cooking. There is a growing need to address energy sustainability, with initiatives aiming to strengthen the capacity for energy market development and improve energy infrastructure.

Agriculture

The agricultural sector in the region focuses on the production of wheat, corn, raspberries, blueberries, aronia, pumpkins, carrots, cabbage, and peppers. Local farmers benefit from subsidies provided by municipal and international programs, alongside support from mining projects and technological investments in areas. **Raspberries** are the primary crop, with around **1,000 farmers** cultivating an average **farm size of 0.3 hectares,** typically relying on **monoculture practices**. These farmers sell directly to large **local collective centers.**

Livestock farming is minimal in the region, with many individuals abandoning this practice in favor of less labor-intensive systems, as it is increasingly seen as unattractive. **Livestock** production **fails to meet local** demand for meat and dairy products. Additionally, the absence of an irrigation system poses challenges for agricultural land, and there is **no organic farming** currently practiced in the area.

In recent years, the expansion of agriculture has caused significant deforestation, destroying habitats, reducing biodiversity, increasing soil erosion, and disrupting ecosystems. Animals and birds that once relied on forest cover for shelter and food are now forced to move to other areas, sometimes closer to human settlements, where they come into conflict with people. For example, in this territory, **crows,** whose natural habitats are diminishing, have started displaying unusual behavior by **invading farmlands** and even attacking people. The stress on these birds, due to the reduction of their habitat and food sources, has made them more aggressive and disruptive. They damage crops, leading to further losses for farmers.

Pesticides, widely used by farmers, have also negatively impacted bee populations, essential for crop pollination, thus threatening crop yields and reducing biodiversity. Also pesticides negatively affect air quality, as chemicals are dispersed into the atmosphere, harming not only local residents but also the environment as a whole.

Another distressing impact of climate change and environmental stressors is the decline of the pear tree, a culturally significant species and an identity symbol for the Llap region. With climate patterns shifting, these trees are struggling to adapt. **Old pear trees**, which have been a part of the landscape for generations, **are dying off,** and the new saplings cannot thrive in the increasingly harsh conditions.

Changing climate patterns have **disrupted traditional planting schedules**, with farmers now forced to adjust the timing of their planting to align with unpredictable weather. This shift disrupts established agricultural practices, making farming more challenging and reducing crop yields. The region is also experiencing an increase in **hail events**, which further threaten agricultural productivity. Hailstorms damage crops, leading to significant losses for farmers.

Also, the **decrease in rainfall,** compounded by a decline in snowfall and the reduced longevity of snow cover, is having a serious impact on agricultural productivity. Water scarcity has become more pronounced, as low precipitation levels directly affect soil moisture and the availability of water for irrigation. Farmers depend on their **own wells,** some of them used directly from the rivers. There is **no restriction or quotas** until now for the use of the water.

Livestock breeding in the region is facing serious setbacks due to worsening environmental conditions. Animals are increasingly vulnerable to disease because of weakened immune systems, a problem worsened by limited access to high-quality grazing land and nutritious feed. The changing climate patterns have reduced the availability and quality of grazing areas, resulting in poor forage that does not meet the animals' nutritional needs. Consequently, livestock experience slower growth, lower reproduction rates, and higher susceptibility to illness.

Moreover, the burning of forests as a method to clear land for agriculture is worsening **air quality** in the region. Forest fires release pollutants and carbon dioxide, adding to local air pollution and contributing to global warming.

The expansion of urban areas has also led to the misuse of agricultural land, particularly around Batllava, where unauthorized construction projects have encroached upon farmland. This not only reduces the available land for agriculture but also creates further strain on the region’s environmental resources, as agricultural lands are essential for local food production and soil conservation.

Concrete factories, in turn, discharge waste and cleaning residues onto farmland, impacting soil quality and agricultural productivity. Additionally, dust emissions from

concrete production contribute to local air pollution, affecting both the environment and the health of nearby residents.

Forestry and Natural Resources

The region's forests cover an extensive area, with approximately **28,000 hectares of public forest** and an additional **9,000 hectares are privately** owned. These forests are primarily composed of tree species such as hornbeam, beech, pine, and an understory that includes species like gorse. Notably, four key pine forests—*Te Pishat*, *Kërpimhu*, *Batllava*, and *Sallabaja*—have been designated for tourism and attract visitors due to their scenic beauty and outdoor recreational opportunities. However, the forests are also a crucial resource for local industries, providing timber used in the manufacturing of doors, windows, and wood pellets, and serving as a primary source of fuel for household heating.

Deforestation in the region is driven largely by economic factors and the widespread reliance **on wood for heating,** particularly during the colder months. Many households lack access to affordable and sustainable heating alternatives, making firewood essential for their survival. This reliance extends beyond households, with schools and other institutions also depending on wood for heating due to the scarcity of other options. Consequently, both private and public forests are being depleted at an alarming rate.

First, the decrease in forested areas has **reduced natural water retention**, resulting in more frequent f**looding and a decline in rainfall**. Without the trees' natural ability to absorb and slow rainwater, runoff accelerates, which causes the water to leave riverbeds and flood surrounding areas, eroding soil and damaging nearby lands.

Furthermore, deforestation has severely **impacted the habitats of wildlife** in the Podujevë region. Species like **bears** are being forced to descend from higher altitudes as their natural habitats shrink, putting additional strain on both wildlife populations and human safety. At the same time, larger predatory birds, such as **eagles**, are becoming **more prevalen**t. This shift in wildlife behavior further underscores the negative impacts of habitat destruction.

The region's pine trees, in particular, are showing signs of decline, with many trees **wilting over the past two years**. This die-off of pine trees not only affects biodiversity but also undermines the region's tourism appeal, as these pine forests are popular among visitors. Additionally, the heavy exploitation of forested land has reduced the water levels in key bodies of water, including the Llap River and Batllava Lake, impacting both aquatic ecosystems and the communities that rely on these water sources for drinking, irrigation, and recreation.

The environmental consequences are severe. The loss of tree cover has led to significant soil degradation, **reducing soil fertility** and forcing farmers to clear additional forest land to maintain agricultural productivity, perpetuating a damaging cycle. Furthermore, deforestation contributes to declining air quality, compounding the region's environmental challenges.

Lastly, the region's expanded **lighting network,** intended to improve safety and visibility, has inadvertently affected local **bee populations**. Bees seem to be now disoriented by artificial lighting that extends their active hours. Consequently, bees remain active after sunset, disrupting their biological clock and **shortening their lifespan**, which now averages **less than 21 days.** This could have severe implications for pollination and local agriculture.

Water

The municipality consumes 50,000 to 60,000 m³ of water daily, but **water resources** are under **severe stress.** Illegal mining operations, along with unauthorized sand and gravel extraction from the Llap River, have significantly lowered water levels, disrupting both surface and groundwater systems. As a result, wells that once provided water at a depth of 6 meters now require drilling beyond 10 meters. The surge in the number of **unregulated wells**, coupled with the overuse of drinking water for non-potable purposes, further depletes this critical resource. The rapid growth of **unpermitted construction** has disrupted the natural flow of underground water, leading to potential long-term shortages and altering groundwater recharge patterns.

Moreover, in summer, the region experiences a substantial population increase due to returning diaspora and tourists, leading to heightened demand for water. This seasonal spike, coupled with rising temperatures, has led residents to increase their use of water pumps, straining local water resources and contributing to further **depletion of Batllava Lake.** The pressure on water resources is compounded by a failed municipal project aimed at providing water distribution from an old water source in the village of Kërpimeh to five surrounding villages. Despite the project's potential to alleviate water scarcity, it was never completed, leading to ongoing protests from local residents who still face severe water shortages.

Additionally, **water quality** faces significant challenges, including **high manganese levels**. While the municipality supplies treated drinking water, the growing reliance on **untreated well water** is concerning, especially as there is no available data on its quality. Industrial pollution, including plastic waste and oil refinery discharges, contributes to the contamination of waterways, affecting both water quality and local biodiversity. **Tourism,** while an economic boon, worsens the situation : many restaurants and establishments around the lake are discharging **untreated sewage** directly into the water, further degrading **water quality** and tourists leave waste behind, further deteriorating the lake's environmental health and its recreational appeal.

The declining water quality, combined with the depletion of Batllava Lake, has led to a noticeable **drop in fish populations** with smaller, less diverse fish species replacing what was once a thriving ecosystem. In the village of Kërpime, where the Llap River flows, trout have virtually disappeared.

Climate Change in Podujevo: Consequences

Climate change is severely impacting Podujevo, particularly its agricultural sector. Certain crops are no longer insurable due to anticipated high damage, and extreme weather patterns are straining food reserves. For example, in 2024, the region experienced 16 days of temperatures exceeding 31°C, exacerbated by the effects of El Niño and heightening food insecurity.

Heavy hailstorms, such as those in 2022, caused significant agricultural damage, prompting 400 farmers to seek subsidies to recover losses. For now, the municipality supports an intensive irrigation system to enhance agricultural resilience against extreme weather events.

The impacts of climate change extend to public health, with extreme heat and pollution driving an increase in virus outbreaks, seasonal flu severity, and respiratory issues. Although life expectancy is rising, chronic illnesses linked to industrial pollution and untreated water are becoming more prevalent, underscoring the need for urgent mitigation and adaptation efforts.

Collective action/ Needs raised :

One of the primary concerns is the persistent issue of low agricultural yields, which is being exacerbated by climate shifts. To combat this, it is essential to first identify the root causes of reduced productivity, such as soil degradation, water scarcity, and changing weather patterns. Once these causes are understood, farmers can be guided in adopting adaptive strategies, which may include transitioning to more resilient crops that can withstand extreme weather conditions, droughts, or temperature fluctuations.

An equally important need is to raise awareness among farmers about the timing of pesticide application, particularly the importance of spraying plants in the evening or during the night. This practice is vital for protecting the region's declining bee populations, which are essential for pollination and the overall health of agricultural systems. Educating farmers on how to balance pest control with ecological responsibility can help ensure the long-term viability of both agriculture and local biodiversity.

Participants also emphasized the need for large-scale environmental **restoration projects**, such as mass **reforestation initiatives**, to help combat soil erosion, restore biodiversity, and mitigate the impacts of climate change. Trees play a critical role in maintaining a balanced ecosystem, improving air quality, and regulating water cycles, all of which are increasingly under threat. Along with reforestation, the **construction of reservoir** lakes was mentioned as a step in managing water resources, particularly in areas that face recurring droughts and water shortages. These reservoirs can store water during wet periods, ensuring a stable supply during times of scarcity, which is especially important for both agriculture and local communities.

Lastly, the **promotion of biofarms** was seen as a promising solution for the region. By shifting towards organic and sustainable farming practices, biofarms can reduce the dependency on chemical fertilizers and pesticides, which have been damaging to both the environment and human health. The adoption of biofarm models would not only enhance food security by promoting healthier, more sustainable crops, but it could also foster a more resilient agricultural system that is better equipped to handle the challenges posed by climate change.

PODUJEVE

CONTEXT

Socio-economic context
- Population aging
- Increase in unemployment rate
- high population density : 2,635 people per km² in Podujeve

Geographic context
- significant extent of natural spaces with 28 000 ha of forest
- varied geography: Llap Valley, flat area and Kopaonik Mountains
- Llapi and Kaqandolli River
- Batllava Lake

Energy context
- Electricity mainly comes from hydropower plants
- Increasing dependence on fossil fuels (imports)
- wood heating - pressure on the forest

HUMAN ACTIVITIES

Health
- QKMF main institution
- Hospital in under construction

Urbanism
- Housing degradation and insulation issues
- Exclusively road transport
- Chronic water supply difficulties and bad water quality

Tourism
- Tourism increase in the area
- Pressure on water resources around batllava Lake

Agriculture, breeding forestry
- Pear tree production are dying off
- High area of blueberry production with an average size of farm of 0,3ha
- Decrease in yield production
- Very limited livestock production, unable to meet local (meat and dairy)

Industry
- Highly carbonated industries
- Risks of water restrictions

RESSOURCES

burning forest to clear land →
- Atmospheric pollution increase
- Increase in greenhouse gas concentration from the fire forest to clear land and heating from wood

Atmosphere

Unregulated Irrigation →

deforestation around Llap river basin →
- Depleting local water resources
- Deterioration of water quality
- Lengthening of low water period
- Reduced forest cover near Batllava Lake and Llap River has lowered water levels
- Disruption of natural water retention

Water

impact of cultural practices on soil life →
- Erosion
- Fertility depletion
- Chemical contamination

Soil

fall in pear tree yield →

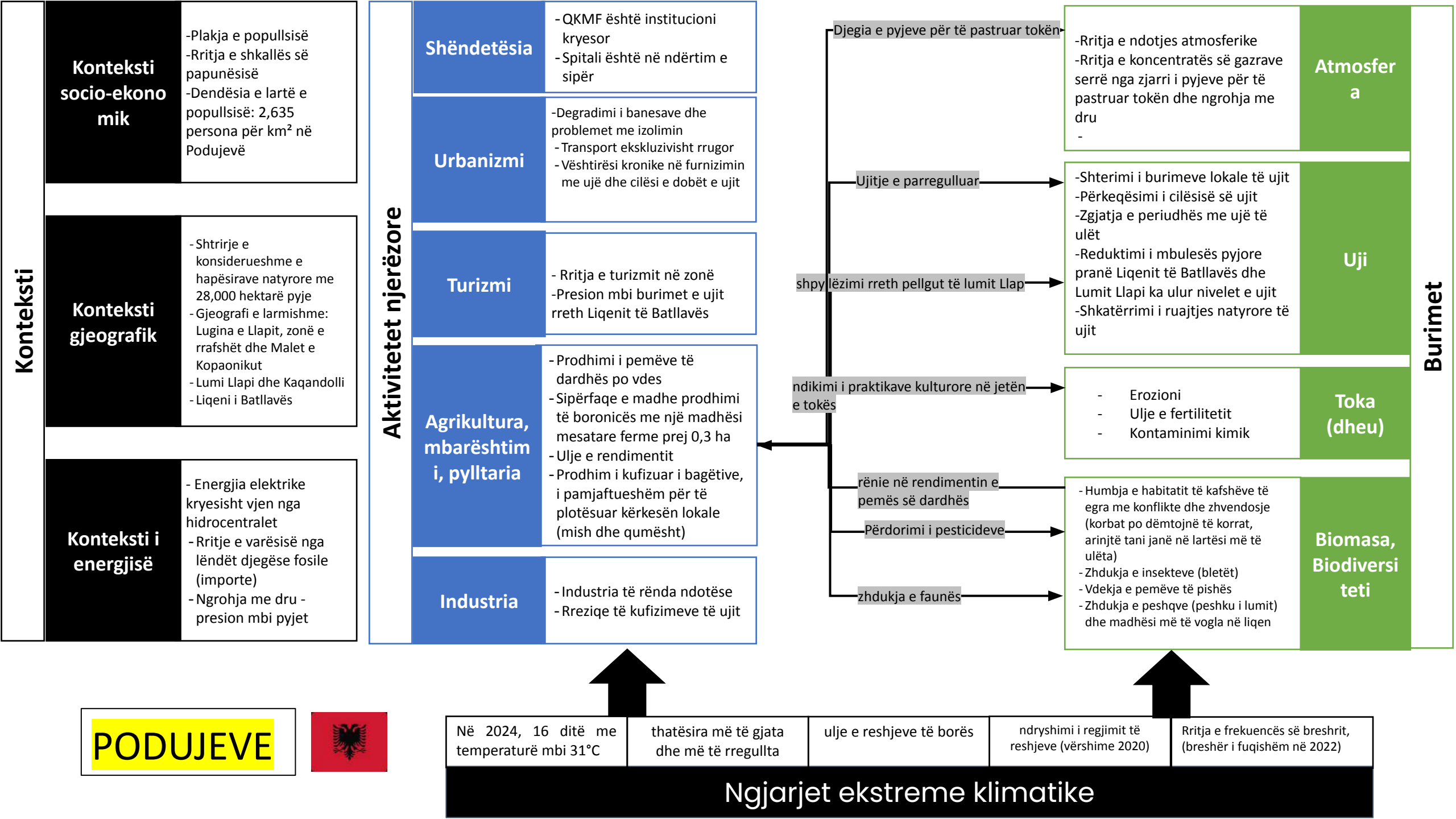
Pesticides use →

disappearance of fauna →
- Wildlife habitat loss with conflicts and displacement (crow are damaging crops, bear are now at lower altitude)
- Disappearance of insects (bees)
- Die-off pine trees
- Disappearance of fish (trout) and smaller size in the lake

Biomass, Biodiversity

Climate-related vulnerabilities

In 2024, 16 days with a temperature above 31°C	longer and more regular droughts	decrease in snowfall	change in precipitation regime (flooding 2020)	increase in hail frequency, (heavy hailstorm in 2022)


Konteksti
Konteksti socio-ekonomik
-Plakja e popullsisë
-Rritja e shkallës së papunësisë
-Dendësia e lartë e popullsisë: 2,635 persona për km² në Podujevë
Konteksti gjeografik
- Shtrirje e konsiderueshme e hapësirave natyrore me 28,000 hektarë pyje
- Gjeografi e larmishme: Lugina e Llapit, zonë e rrafshët dhe Malet e Kopaonikut
- Lumi Llapi dhe Kaqandolli
- Liqeni i Batllavës
Konteksti i energjisë
- Energjia elektrike kryesisht vjen nga hidrocentralet
- Rritje e varësisë nga lëndët djegëse fosile (importe)
- Ngrohja me dru - presion mbi pyjet
Aktivitetet njerëzore
Shëndetësia
- QKMF është institucioni kryesor
- Spitali është në ndërtim e sipër
Urbanizmi
-Degradimi i banesave dhe problemet me izolimin
- Transport ekskluzivisht rrugor
- Vështirësi kronike në furnizimin me ujë dhe cilësi e dobët e ujit
Turizmi
- Rritja e turizmit në zonë
-Presion mbi burimet e ujit rreth Liqenit të Batllavës
Agrikultura, mbarështimi, pylltaria
- Prodhimi i pemëve të dardhës po vdes
- Sipërfaqe e madhe prodhimi të boronicës me një madhësi mesatare ferme prej 0,3 ha
- Ulje e rendimentit
- Prodhim i kufizuar i bagëtive, i pamjaftueshëm për të plotësuar kërkesën lokale (mish dhe qumësht)
Industria
- Industria të rënda ndotëse
- Rreziqe të kufizimeve të ujit
Djegia e pyjeve për të pastruar tokën
-Rritja e ndotjes atmosferike
-Rritja e koncentratës së gazrave serrë nga zjarri i pyjeve për të pastruar tokën dhe ngrohja me dru
-
Atmosfera
Ujitje e parregulluar
shpyllëzimi rreth pellgut të lumit Llap
-Shterimi i burimeve lokale të ujit
-Përkeqësimi i cilësisë së ujit
-Zgjatja e periudhës me ujë të ulët
-Reduktimi i mbulesës pyjore pranë Liqenit të Batllavës dhe Lumit Llapi ka ulur nivelet e ujit
-Shkatërrimi i ruajtjes natyrore të ujit
Uji
ndikimi i praktikave kulturore në jetën e tokës
- Erozioni
- Ulje e fertilitetit
- Kontaminimi kimik
Toka (dheu)
rënie në rendimentin e pemës së dardhës
Përdorimi i pesticideve
zhdukja e faunës
- Humbja e habitatit të kafshëve të egra me konflikte dhe zhvendosje (korbat po dëmtojnë të korrat, arinjtë tani janë në lartësi më të ulëta)
- Zhdukja e insekteve (bletët)
- Vdekja e pemëve të pishës
- Zhdukja e peshqve (peshku i lumit) dhe madhësi më të vogla në liqen
Biomasa, Biodiversiteti
Burimet
PODUJEVE
Në 2024, 16 ditë me temperaturë mbi 31°C
thatësira më të gjata dhe më të rregullta
ulje e reshjeve të borës
ndryshimi i regjimit të reshjeve (vërshime 2020)
Ritja e frekuencës së breshrit, (breshër i fuqishëm në 2022)
Ngjarjet ekstreme klimatike

ANNEX 1: Agenda of the workshop (for Kosovo)

8:00 : Team and venue setup
8:45 : Participant arrival
9:00 : Welcome and introduction to the day's objectives and the project overview
9:15 : Start of the Climate Fresk workshop

- Mapping exercise (cards): 1h
- Break: 15 min
- Creativity and emotions session: 30 min
- Understanding carbon scale and introduction to related ecological challenges (water, biodiversity, air, etc.): 15 min
- Group reflection on individual actions to reduce environmental impact: 15 min

11:45 : Lunch break

13:00 : Afternoon introduction
13:10 : Overview of the territory and its characteristics (with cards as jimmy mentioned)
13:20 : Collective diagnosis of the territory (paired discussions by theme, 5 min each with rotations, world café)
14:10 : Connecting natural resources and human activities (on the table/or wall, with arrow drown and post-it)
14:45 : Break
15:00 : Key insights from the Climate Fresk / Impact of climate change on the territory

- Brainstorming on collective actions for the territory (municipal and business initiatives)

15:40 : Next steps and identified needs
16:00 : Closing