Foresight-Driven Pathways for Circular Economy Integration

Kyrgyzstan's Food and Tourism Sectors

The SWITCH-Asia Programme

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List of Acronyms and Abbreviations

CBT	Community-Based Tourism
CE	Circular Economy
DMO	Destination Management Organization
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
EU	European Union
EBRD	European bank For Reconstruction and Development
KCBTA	Kyrgyz Community-Based Tourism Association
PPP	public-private partnership
SMEs	Small and medium-sized enterprises

What is this study about and summary of sections

This study aims to assess the risks and opportunities of implementing circular economy (CE) principles in the tourism sector of Kyrgyzstan with an emphasis on the food component. The circular economy is based on closing the material and energy loops through the waste reduction, reuse and recycling. CE represents a comprehensive approach covering environmental, social and economic aspects and requires systemic reconstruction of consumption, production and resource management practices. Transition to such a model requires long-term, consistent efforts and active participation of a wide range of stakeholders.

To form a clear picture, a multi-layer methodology was used, including interviews with key stakeholders, an analysis of current national policies, and a two-day foresight workshop involving representatives from businesses, government agencies, academia, and the expert community. Based on the analysis of the collected data, a risk framework was formulated to reflect current and potential challenges and a set of policy measures was developed to address them, taking into account the short, medium and long-term prospects within the preferred scenario for sustainable tourism development.

Summary of sections

Section "Review: Tourism in Kyrgyzstan - Current State and Potential for Sustainable and Circular Development" represents the key findings based on the interviews with the stakeholders about the opportunities and barriers in the tourism sector including the food component.

Section "Policy and Strategic Initiatives to Support Circular Economy in Tourism with a Focus on Food" provides a brief review of the sector-related policies and strategies, highlighting the strengths and areas for improvement.

Section "Possible Scenarios of Tourism Development in Kyrgyzstan – 2040" is devoted to possible long-term development trajectories of the country's tourism industry. It presents four alternative scenarios and one preferred scenario, formed on the basis of key factors and uncertainties identified by the participants of the foresight workshop. These scenarios help understand the potential challenges and opportunities that may impact the sustainability of tourism and introduction of circular economy in the industry.

Section "Analysis of Scenarios" is devoted to an in-depth assessment of four alternative and one preferred scenario for tourism development in Kyrgyzstan until 2040, with a focus on the food component and circular economy principles implementation. For each scenario, key economic, social, environmental, governance, and technological risks hindering sustainable development were identified. Based on stakeholder interviews and an analysis of national policies, preliminary policy response measures were developed for all identified risks.

Section "Integrating Risks and Recommendations from Alternative Scenarios into the Policy under the Preferred Scenario" focuses on adapting policy measures developed through the analysis of four alternative scenarios to enhance the sustainability of the preferred scenario, *Find Your Place in the Nomad Culture*. Although the alternative scenarios describe various development trajectories, they allow us identifying common vulnerabilities and potential challenges that are important for long-term planning. This resulted in a set of policy recommendations that contribute to strengthening the sustainability of gastronomic tourism and food chains in the face of uncertainty.

Section "Comprehensive List of Measures for the Preferred Scenario Broken Down by Implementation Timeline" presents a summary of risks and corresponding policy measures for implementing the *Find Your Place in the Nomad Culture* scenario. The measures cover risks inherent in the scenario itself, additional risks derived from alternative scenarios, and risks identified during stakeholder interviews. Estimated implementation timelines (short-, medium-, or long-term) are identified for each measure, allowing to take into account implementation complexity, institutional resources, and current needs. The resulting list of strategies can serve as the basis for developing a consistent roadmap for sustainable reforms in the sector.

Review: Tourism in Kyrgyzstan – Current State and Potential for Sustainable and Circular Development (based on stakeholder interviews)

Tourism in Kyrgyzstan contributes approximately 3.5-4% to the country's GDP and plays a particularly important role at the regional level as a source of income and employment. Its unique natural and cultural heritage—from mountain landscapes to nomadic traditions—creates the potential for positioning the country as a sustainable tourism destination. However, the sector remains vulnerable to climate change, environmental degradation, and infrastructure constraints, particularly outside popular destinations such as Issyk-Kul and Karakol.

In recent years, Kyrgyzstan has seen a shift toward sustainable consumption and circular economy (CE) principles in tourism. This process is supported by international development partners, educational institutions, local organizations, and government policy elements.

Based on interviews with representatives of the tourism industry, local communities, government agencies, and academia, key characteristics of the sector, including the food component, were identified both in terms of advantages and systemic challenges, and in the perception of the circular economy principles. These data formed the basis for a scenario analysis and helped outline possible directions for sustainable tourism development in the country.

CE practices and sustainability perception

Implementation of sustainable development principles in tourism is still limited, but includes a range of practices: energy-efficient buildings, solar panels, composting, recycling, waste sorting, etc. However, sustainability is often perceived as a way to save money rather than as an element of environmental responsibility. Stakeholders point to a lack of knowledge and skills to implement sustainable development in practice, particularly in food management, digitalization, and procurement.

Sustainability drivers

The key factors in promoting sustainable tourism in Kyrgyzstan are:

- government policy aimed at developing sustainability in the tourism sector in accordance with the SDGs and the country's commitments under international climate agreements;
- support from international organizations and donors (GIZ, EU, EBRD, etc.);
- interest of foreign tourists and expats in ecotourism;
- CBT[1] and DMO[2] initiatives for the implementation of green solutions including renewable energy, eco-sanitation and training;
- academic sector engagement – integration of green economy into the curricula and support for students' initiatives.

Main challenges and constraints

a. **seasonality of the tourist flow** and instability of income leading to uneven load of infrastructure.
b. **lack of local resources**: local authorities and SMEs in the sphere of tourism face the shortage of qualified professionals, training programs and funding for the infrastructure modernization.

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1   Community-Based Tourism
2   Destination Management Organizations

c. **inadequate institutional coordination** between the ministries, local authorities and private sector. Although the Ministry of Economy and the Department of Tourism play a leading role in policy-making, more sustainable interagency and public-private mechanisms are needed to integrate sustainability principles into transport, infrastructure, and food systems.

d. **weakness of the basic infrastructure** - lack of sewage treatment plants, alternative energy and waste management systems in remote areas.

e. **limited access to financing** and lack of incentives for the implementation of CE solutions in SMEs.

f. **low consumer awareness** and limited tourist demand for sustainable products and services. Circular approaches, such as local supply, zero waste, and eco-certification, are not yet widespread.

g. **lack of territorial plans** taking into account the principles and requirements of sustainable development.

Opportunities and prospects

Kyrgyzstan has the potential to become a leading destination for sustainable, low-impact, high-value tourism. This will require:

- scaling up CBT and other local actors' initiatives;
- enhancing strategic development of sustainability and CE policies (sustainability has been already mentioned in a number of documents, but there is a lack of detail and implementation mechanisms);
- expanding support for SMEs and local suppliers;
- introducing tax and financial incentives for green solutions;
- upgrading infrastructure in the most promising locations, taking into account environmental standards (including energy saving, water treatment, waste recycling and an accessible transport system);
- strengthening intersectoral cooperation in tourism;
- improving staff training.

Such an approach is in line with the preferred future scenario where sustainability, cultural authenticity and circular solutions play a key role.

Connection to scenario analysis development

The insights from the stakeholder interviews formed the foundation for selecting key uncertainties and constructing the scenarios. They bridged the empirical data with the strategic planning logic presented in the following sections.

Policies and strategic initiatives supporting circular economy in tourism with a focus on food.

An analysis of national strategies and programs reveals growing political support for integrating sustainable consumption and circular economy principles into the tourism sector of Kyrgyzstan, including the food component. Key documents emphasizing these priorities such as reducing the carbon footprint, enhancing resource efficiency, and supporting local food systems include the "Kyrgyzstan - a Green Economy Country" Concept, the Tourism Development Program until 2030, and the Nationally Determined Contribution (NDC) of the Kyrgyz Republic.

Among cross-sectoral initiatives, measures on sustainable public procurement and waste management infrastructure development play an important role. Eco-certification is currently developing primarily through individual pilot and donor initiatives and requires more systemic support.

However, current sectoral strategies for tourism and the food industry only fragmentarily address circular economy principles pertaining to food waste management, local supply chains, and the bioeconomy.

Stakeholder interviews confirmed that despite the existence of various policies, gaps remain in their coordination and on-the-ground implementation, particularly in tourist areas. The efforts of NGOs, donors, and academic institutions (for instance, through GIZ programs and the Tourism Academy activities) partially compensate for these gaps but require institutionalization and scaling up.

Thus, the existing policy framework is already creating prerequisites for the transition to sustainable practices. However, it requires enhanced interdepartmental coordination, integration of food-related aspects into tourism strategies, and increased support for SMEs and local initiatives.

In this regard, the next part of the report is devoted to possible scenarios for the development of tourism, taking into account the challenges and opportunities for the introduction of a circular economy.

Possible Scenarios of Tourism Development in Kyrgyzstan – 2040

During the foresight sessions, approximately 50 drivers of change were identified that could shape the tourism industry development within the circular economy framework over the next 15 years.

From the identified drivers, participants selected key uncertainties that form the core dimensions for building scenarios using the 2x2 Matrix method. In their view, the future development of the tourism sector will depend most significantly on a combination of political and environmental factors, as well as dynamics in the economy and innovation.

Two key uncertainties were selected as the defining dimensions: the **geopolitical situation** and the **state of the environment**. Additionally, to refine and enrich the scenarios, two further uncertainties were identified: the **development of IT technologies** and the overall **economic situation**. These uncertainties define the core dimensions presented in the following diagram (Figure 1).

HIGH IT DEVELOPMENT · STABLE PEACE · ECONOMIC GROWTH

Scenario 1

The tourism sector and its circular component are developing in the context of a stable international situation, economic growth, a high level of IT and concern for the environment.

Scenario 2

Tourism and related circular economy are developing in a context of stable peace in Central Asia and high IT development, but the situation is complicated by the presence of an environmental disaster.

PROTECTION

Scenario 4

The conditions for the development of tourism and the circular component are military conflict and a developing economic crisis, while concern for the environment is also demonstrated.

Scenario 3

Tourism and its circular component are developing in the context of environmental disaster, stagnation in IT and the ongoing military conflict.

ECOLOGICAL DISASTER

ECONOMIC CRISIS · MILITARY CONFLICT · STAGNATION IN IT

Figure 1. Scenario matrix for tourism development in Kyrgyzstan – 2040

Based on this context, four scenarios were developed.

1 · Scenario 1. New Professionals – New Approaches

The new future for the tourism sector in Kyrgyzstan began with training a new generation of personnel, who received targeted education in tourism development and circular economy. Thanks to their knowledge and expertise, green technologies have been widely implemented, focusing on energy efficiency and energy saving, reducing atmospheric emissions, minimizing solid waste, and promoting effective waste management.

Due to geopolitical stability in the region, the flow of tourists is increasing. There is a growing demand for combined services: a blend of national colour, traditional cuisine, and high-quality service. Therefore, glamping sites have seen significant development combining all these aspects and offering tourists the opportunity to participate in national games, equestrian competitions, and learn to cook traditional dishes. Modern technologies monitor tourist flows, helping to limit the number of people at popular sites to prevent harm to the environment.

Tourism is becoming an all-season industry. A personalized approach to designing tour packages for each visitor is enabled by new software systems that not only collect personal data but also analyse preferences and develop customized itineraries and destinations. Furthermore, tourists are invited to participate in the Eco-Kyrgyzstan program, allowing them to accumulate points throughout their trip for engaging in various eco-initiatives that have become widespread across every region of the country—from waste collection to saving water and electricity at tourist facilities. At the end of their stay, these points can be exchanged for valuable gifts and national style VIP souvenirs.

2 Scenario 2. Resilience in a Crisis

A uranium leak at the Issyk-Kul deposit triggered an environmental catastrophe, leading not only to the relocation of the population to other parts of the country but also to a complete halt of tourist flow to the region. However, thanks to strong civic engagement and state financial support, the necessary emergency response measures were quickly organized. Additionally, Kyrgyzstan neighbours in the Central Asian region, for whom Issyk-Kul has always been a traditional vacation destination, promptly joined the efforts. An intergovernmental group is being established to develop the necessary measures and steps to address the situation. The international community is also getting involved.

While the state, public, and international organizations are engaged in restoring the natural environment and water resources at the site of the environmental catastrophe, the tourism industry is actively adapting by developing new types of services tailored to the emerging situation. Extreme tours are being launched for researchers and volunteers wishing to participate in restoration efforts, as well as educational tours for schoolchildren and university students on how to prevent an ecological collapse.

The Issyk-Kul disaster has seriously aggravated the country's water problem. Water prices were about to skyrocket and become a source of social disaster. However, the widespread introduction of "smart meters" helped avert the situation. The transition of many housing and communal services to cyclical water use has proved economically and financially beneficial. In the field of agriculture, an active transition to agroponics has begun, i.e. vertical cultivation of crops with minimal use of water. In addition, research has begun on the development of new crops that are resistant to water scarcity.

3 Scenario 3. From Water Shortages to Regional Tensions and Problem Solving

Under conditions of ongoing global climate change, melting glaciers in Kyrgyzstan have led to a reduction in water availability and a shortage of water. Human neglect of environmental standards also played a role. For many years, the population failed to properly monitor water and other resource consumption. New water-saving technologies were not implemented, and the government failed to develop supply and monitoring standards for private companies. This led to acute shortages of drinking water in a number of large cities.

Therefore, the Kyrgyz authorities began cutting off the water supply to neighbouring countries. Farmlands in Kazakhstan and Uzbekistan were left with lack of water for irrigation, and agriculture began to decline: agricultural production decreased, and major cities were left without food. Kazakhstan became the first country to take countermeasures by closing its border with Kyrgyzstan. Uzbekistan followed the example. An energy and fuel crisis began in Kyrgyzstan, and the entire transportation system was frozen. Riots broke out in southern Kyrgyzstan, and tensions escalated along the borders of Kyrgyzstan, Uzbekistan, and Kazakhstan. A single shot fired at the border was enough to trigger an armed conflict.

However, the desire for a peaceful resolution to the crisis has once again prevailed. The governments of the states involved in the armed conflict are coming to the understanding of the necessity to create a single resource zone, which would ensure joint control over all natural resources, including water. Over time, this will help restore interstate ties and the tourism industry, which had been virtually destroyed. The single economic zone greatly contributed to this recovery.

The influx of former militants from Syria into Afghanistan has led to the activation of extremist groups, unleashing a military conflict that involved Central Asian countries. In turn, the military action led to a large-scale economic crisis and a decline in investment and other economic activity in the region.

Amid the economic crisis and ongoing armed conflict, Kyrgyzstan's pristine natural resources remain its primary resource. Therefore, tourists continue to flock to the country, but now of a special kind. These are extreme tourists who want to enjoy the natural beauty of Kyrgyzstan's mountains while also getting a dose of adrenaline. Private travel companies are emerging to meet this demand. They are typically owned by former military personnel. They maintain contact with each other and thus ensure the safety of all tourist groups who visit and use their services. Tours have been developed that incorporate augmented reality: using modern technology, which has received a new impetus in the context of military operations, tourists become participants in virtual battles. The high demand for these types of tours allows travel companies to maintain their economic viability and thrive. Over time, this group of entrepreneurs formed their own political party to express their interests and improve the military and political situation in the country.

Preferred Future of Tourism Development in Kyrgyzstan -2040

To construct a preferred future, the Future Triangle was used. It allows us not only to construct a vision of the desired development but also to assess the legacy of the past and what exists in the present to advance or hinder our vision. After analyzing the identified facts, five possible scenarios can be developed: Back to the Past, No Change, Minor Change, Adaptive Change, and Radical Change. The participants' choice of one of the scenarios indicates the changes they believe the industry currently requires.

Summarizing the responses of the participants at the seminar in Kyrgyzstan, the preferred future for tourism development in 2040 looks as follows.

Find Your Place in the Nomad Culture

In 2040, Kyrgyzstan will become a country of popular, but not mass tourism, welcoming conscious travelers. This has been facilitated by a system of widespread certification for both food products and services. Research laboratories have been built and are actively operating, and organic products are being grown and produced, which, of course, has impacted prices. While prices have increased significantly, this is a guarantee of quality. The country is doing everything possible to ensure Kyrgyzstan is recognized as the greenest country in Central Asia. Fostering respect for the environment and cultural heritage begins in school. Therefore, the new generation is choosing zero-waste technologies, energy-efficient sources, and the use of AI to calculate individual consumption, including food.

The following tourism destinations stand out: 1) agrotourism, which is actively developing in rural areas; 2) eco-detox tourism, which allows you to switch off from modern gadgets and technologies; 3) the revival of the mountaineering school of Kyrgyzstan has brought new tourists from all over the world, and, of course, 4) gastrotourism, which attracts guests with unique dishes and drinks of Kyrgyz cuisine for every taste.

In cities, the minimum number of cars is used, the primary mode of transport is a bicycle. High-speed trains run between the cities. The infrastructure is well-established, and tourists can easily get to various locations, including mountains, using appropriate transport. Air traffic within the republic and to foreign countries has expanded due to the construction of new regional airports. Eco-trails have become widespread, allowing tourists to move around without disturbing the landscape of nature. Kyrgyzstan holds a high position in terms of safety standards, including in trekking and mountaineering.

Not just nature parks, but areas where animals roam freely and anyone can come and care for them can be found in every community. Cultural events dedicated to national games are popular among tourists. Overall, Kyrgyzstan aims to increase the share of the tourism sector in the country's GDP to 15% by 2040. The primary focus is on a distinctive style and a unique national culture that has never been in opposition to the surrounding nature, but rather lived in unity with it, preserving and protecting it.

When choosing options for the steps to achieve the preferred future, the audience unanimously voted for adaptive changes, including:

1. development of a high-quality infrastructure in the country,
2. availability of skilled professionals in all the sectors, not just tour operators,
3. favorable investment climate,
4. tourism sector actively using circular approaches,
5. green and climate finance development.

The above changes imply the following actions:

1. creation of a separate government institution for tourism development. It is also possible to elevate the status of the current government agency, the Department of Tourism. It will be responsible for the construction of new roads and the rehabilitation of existing ones; implementation of renewable energy sources; and review and development of new regulations in tourism, food industry, and agriculture. It will also be responsible for budgeting for fundamental research aimed at developing these sectors. This Ministry/Department will support intersectoral ties, as tourism is linked to a wide range of activities in the fields of economics, culture, healthcare, internal and external security, etc.;
2. reforming the educational system in the sphere of tourism;
3. a five-year tax exemption for businesses implementing circular economy principles; and development of high-quality investment projects;
4. active promotion by the government of circular approaches and working with business associations to promote them;
5. introduction of appropriate fees in unique places to preserve the pristine nature; restrictions on visiting relict places; introduction of a tourist (city) tax.

The proposed scenarios and changes imply certain risks in their implementation. A comprehensive risk assessment is provided in the following sections of this report.

Analysis of scenarios

Risk analysis methodology and scenario-based addressing measures

An analysis of the risks associated with the implementation of circular economy principles in the tourism sector, with a focus on the food component, was conducted based on the scenario approach proposed within the project. For each of the four alternative scenarios for tourism development in Kyrgyzstan until 2040, the most significant risks that could hinder the transition to more sustainable consumption and production patterns were identified.

The key methodological principles included:

- **A multi-level risk analysis framework** covering economic, managerial/technological, social and environmental aspects. This allowed for a comprehensive assessment of the potential vulnerabilities of the food tourism component in each scenario.
- **Focus on circular food practices** such as food waste reduction, localized supply, sustainable recycling methods, eco-friendly packaging, and their integration into tourism infrastructure.
- **Reliance on empiric data**, including:
  - interviews with the key stakeholders (government authorities, business associations, NGOs, and representatives of tourist destinations);
  - analysis of existing strategies, laws and programs aimed at sustainable consumption and development of circular economy in the sphere of tourism and agricultural food.
- **Identification of vulnerabilities** reflecting weaknesses in existing management systems, infrastructure, and institutional interactions, which may manifest differently in each scenario.

The findings provide a basis for developing policy recommendations, both proactive and reactive, that can reduce negative impacts and enhance the sustainability of food tourism in a variety of possible future contexts.

Risks in four alternative scenarios

This section presents the risks associated with the food component in the context of circular economy for each of the four scenarios. All risks are structured within a comprehensive framework that includes governance, economic, social, and environmental categories.

Using this universal framework allows for risk comparison across scenarios and ensures their analysis within a unified analytical context.

Risks for scenario 1. New Professionals – New Approaches

Focus on implementing sustainable standards and digital solutions in the food provision of tourism, leveraging a new generation of professionals and green innovation.

Economic risks

- Unaffordability of sustainable and organic products both for tourists and local population.
- High cost of implementing green technologies and digital solutions in the food sector.
- Potential dependence on grants and external funding for the start of sustainable food initiatives.

Technological and governance risks

- Dependence on digital tools and AI with insufficient technical readiness in regions.
- Lack of practical competencies among new staff on sustainable food and circular strategies.
- Lack of interdepartmental coordination for the implementation of integrated solutions in the food and

tourism system.

- Risk of excluding small or seasonal producers due to excessive certification requirements (also applies to social risks)

Social risks

- Unequal access to green technologies and training between urban and rural areas.
- Unequal access to organic food (also included above in the Economic Risks category)

Environmental risks

- Increased pressure on natural resources (water, land) with the expansion of gastronomic tourism without sustainable control.
- Risks of implementing solutions without assessing their life cycle (e.g., packaging or transport logistics).

Risks for scenario 2: Resilience in a Crisis

Focusing on the food component in tourism from the circular economy perspective as a tool for adaptation to economic and climate shocks.

Economic risks

- Reorientation of tourism toward voluntourism and humanitarian programs could reduce the sustainable profitability of food chains, as the emphasis shifts from quality and locality to minimal costs.
- Risk of a decline in profitability for local gastronomic businesses, which could be displaced by free or subsidized initiatives.
- Rising logistics and transport costs, especially during crises, will hinder circular solutions such as sourcing from local farmers.

Governance and technological risks

- Weak adaptation mechanisms at the local level make quick response to supply disruptions, food supply disruptions, or changes in demand impossible.
- Lack of coordination platforms between sectors (tourism, agriculture, processing), especially in crisis situations, limits sustainable planning.
- Insufficient implementation of digital monitoring systems for food flows and waste.

Social risks

- Psychological fatigue and loss of interest in sustainable behavior both among tourists and local population.
- Decreased consumer awareness due to a focus on survival rather than sustainability.
- Loss of trust in local producers due to supply disruptions or declining food quality

Environmental risks

- Secondary contamination and increased food waste in case of no logistical solutions for managing excess humanitarian aid supplies or substandard products.
- Rejection of circular solutions (e.g., composting) in favor of rapid, linear measures aimed at eliminating the consequences of the crisis.

Risks for scenario 3: From Water Shortages to Tensions and Problem Solving

Focus on ensuring water sustainability of the food system in tourism through circular and cooperative solutions.

Economic risks

- Growing water and irrigation prices lead to higher costs for local food production, reducing the competitiveness of local gastronomic services in the tourism sector.

- Disruption of food chains in regions dependent on water-intensive crops or agriculture, particularly in southern Kyrgyzstan, leads to increased dependence on imports.
- Reduced attractiveness of investment in local food production using circular technologies (biogas, aquaponics) due to unstable water supplies.

Governance and technological risks

- Politicization of water resource allocation between regions and sectors can create imbalances in the supply of drinking water and food to tourism facilities.
- Lack of an integrated approach to water and food resource management within tourism destinations.
- Insufficient support for water-saving technologies in food processing (e.g., water reuse systems in hotel kitchens, restaurants, or farms serving tourism).

Social risks

- Increased conflict between tourists and local communities for access to water and food.
- Reduced quality of food services at tourist sites, especially during drought periods, due to water restrictions.
- Consumer distrust of the quality of local products if it is associated with poor water supply or unsustainable growing conditions.

Environmental risks

- Depletion of water resources, including in key tourist areas (such as Issyk-Kul), due to increased tourism and water consumption by hotel and restaurant infrastructure.
- Reduction of biodiversity in agroecosystems serving tourism due to a transition to more drought-resistant, but less environmentally friendly practices.
- The threat of soil degradation under intensive agriculture conditions due to water shortages and disruption of organic matter circulation (for example, in the absence of composting due to water shortages).

Risks for scenario 4: Extreme Tourism and Sector Militarization

Focus on preserving food security and equity amidst the growth of niche tourism and weakening regulation.

Economic risks

- **Narrow specialization of the tourist product (extreme tourism)** leads to a decrease in demand for traditional gastronomic offers, which undermines the development of the local food component in tourism.
- **Sustainable food infrastructure investment decrease**, as priority is given to security, logistics and extreme formats.
- **Unaffordability of local eco-products**, as wealthy and elite tourists become the main clients - this stimulates the import of expensive niche products instead of local food chains development.

Governance and technological risks

- **Lack of environmental certification requirements for new extreme tourism facilities.** Circular approaches, such as food waste recycling or water-saving technologies, are rarely considered when creating tourist recreation sites, camps, and infrastructure.
- **Minimal participation of local communities** in organizing catering for tourists – a centralized catering system is created that does not include farmers or cooperatives.
- **Ignoring innovative solutions** (e.g. solar dryers, composters, rainwater harvesting systems) due to militarization and focus on simple, durable solutions without an environmental focus.

Social risks

- **Growing inequality between local food producers and adventure tour organizers** who prefer to buy food centrally or import it.
- **Erosion of traditional gastronomic practices and local culinary brands** that have no place in the extreme segment.
- **Alienation of local communities** not involved in the new tourism format servicing, including food and agricultural tourism.

Environmental risks

- **Ignoring environmental standards for the disposal of food waste in remote locations**, which can lead to pollution of specially protected natural areas.
- **Increase in disposable packaging** and plastic in food logistics (field food, army rations), lack of reverse collection.
- **Lack of sustainable supply systems**, especially in mountainous and remote areas, where food is not provided in a closed-loop manner (e.g. food is not composted, not recycled, water is not refiltered).

Government policies to prevent risks in four scenarios

This section presents recommendations for the four scenarios focusing on the food component within the circular economy in tourism. The recommendations are grouped by risk type (economic, social, environmental, governance, and technological) and are derived from mapping scenario risks against identified policy gaps. They are also supported by interview questions and examples. This approach ensures:

- practicality - recommendations are based on real cases and stakeholder needs,
- political relevance - takes into account current strategies and the legal framework,
- flexibility of application – recommendations are adapted to various development scenarios for the sector, including unforeseen changes in the economy, climate and tourist behavior.

Measures for scenario 1: New Professionals – New Approaches

Key vector: digitalization, sustainable standards, new personnel generation.

Economic risks – unaffordability of sustainable products

Problem: Eco-products may become unaffordable for low-income tourists and rural suppliers.

Recommendations:

- **Develop a mechanism for subsidies and grants and other support measures for SMEs in tourism** using local and sustainable products - similar to the Green Innovation Fund, elements of which are already being used in Kyrgyzstan within the GIZ projects to support the green economy and small businesses.[3] [4]
- **Create green procurement mechanisms** that provide a minimum share of local sustainable products in the food chain of guest houses and hotels.
- **Pilot "green baskets"** – travel packages with included meals from certified suppliers (example: CBT Karakol).

Rationale: Policy analysis reveals a lack of support for local supply chains. Interviews with Karakol DMO and the Business Association (Nurbek) confirm the need to stimulate demand.

Technological risks – dependence on digital technologies in resource management

Problem - Not all the regions are ready to implement digital systems of food accounting and planning.

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3   https://www.giz.de/de/downloads/giz2023-en-green-economy-and-sustainable-private-sector.pdf?utm
4   https://jia.kg/ru/news_detail/prodvizhenie-zelenyj-biznes-praktik-v-kr/?utm

Recommendations:

- **Develop modular digital tools** for accounting of food waste and seasonal menus, adapted to the level of digital maturity (with offline use possible).
- **Conduct trainings on digital literacy** and sustainable food planning in partnership with the Tourism Academy, DMOs and NGOs (in the spirit of existing courses from PERETO and GIZ).
- **Develop national online platforms** for sharing information on sustainable suppliers and tools for circular food management.

Rationale: The Tourism Academy and Karakol DMO, in interviews, noted a shortage of digital and analytical skills among local operators, as well as a lack of national platforms with information on sustainable suppliers and circular food management tools. The creation of such a platform at the national level (with the possibility of initial piloting in individual regions or destinations) would standardize approaches and expand access to necessary data.

Social risks

1. Regional gap in access to innovation

Problem: new technologies and approaches are concentrated in Bishkek and large centers.

Recommendations:

- **Establish regional demonstration hubs** (based on DMOs or colleges) on circular food management in tourism (menus, packaging, waste).
- **Integrate circular food practices** into secondary vocational education programs (vocational education in the hotel industry and tourism).
- **Support the development of sustainable agro-tourist routes**, including visits to local suppliers (farm tours, master classes).

Rationale: the gap between regions was emphasized in the interview with DMO Karakol; the policy also does not cover agricultural tourism as an area of support.

2. Risk of over-standardization (can be also related to governance risks)

Problem: strict certification standards may exclude small seasonal farms.

Recommendations:

- **Develop a multi-level system of voluntary eco-certification**, including an "entry level" for SMEs with reduced administrative barriers.
- **Introduce mentoring support and a voucher system** for certification through DMOs and specialized associations (e.g., KCBTA – Kyrgyz Community-Based Tourism Association). The voucher system involves providing enterprises with targeted certificates for the payment of consultations, training, or other associated costs associated with obtaining eco-certification.
- **Integrate certification into marketing support** (national platforms, participation in fairs, tourist catalogues).
- **Integrate information on the availability of sustainable/eco-certification into marketing support mechanisms** (through national platforms, participation in fairs and tourism catalogues), providing for priority placement or visual distinction for certified.

Rationale: Interviews with PERETO and KCBTA showed that even being interested in certification, SMEs cannot meet the requirements without support.

Environmental risks

In this scenario, environmental risks are not explicitly emphasized, but they can be indirectly addressed through measures to:

- promote locally produced, sustainable products (reducing the logistics footprint),
- implement digital food waste management,
- train regional communities in eco-friendly practices.

Measures for scenario 2: Resilience in a Crisis

Key vector: adaptation to economic and climatic shocks, searching for inexpensive solutions, short-term viability prevalence.

Economic risks

1. Vulnerability of local food chains

Problem: In times of crisis, the first to suffer are farmers, local suppliers, and street vendors.

Recommendations:

- **Create guaranteed sale schemes for local suppliers** linked to tourist sites (through contracts, cooperatives).
- **Integrate support for local farmers into tourism infrastructure provision programs** (for example, requiring a share of local suppliers in government support).
- **Provide access to microfinance and anti-crisis support** for small food businesses in tourist areas.

Rationale: Policy analysis showed weak inclusion of the food component in tourism support measures; interviews with Karakol DMO and businesses highlighted the loss of sales channels.

2. Bias towards extensive and one-off solutions

Problem: In times of crisis, cheap but unsustainable practices prevail - disposable packaging, imported food, coal heating.

Recommendations:

- **Develop fast-track subsidies for local circular solutions**, especially for food (e.g. biodegradable packaging, reusable containers).
- **Support the transition to local seasonal menu and food preservation systems** to cut import reliance via training, awareness campaigns, and incentives for local sourcing.
- **Integrate sustainable food requirements into sanitary regulations and emergency procedures** (e.g., prioritize local and seasonal products, reduce food waste, use eco-friendly packaging).

Rationale**:** Interviews with Karakol DMO and local businesses revealed the instability of supplies and a reversion to disposable materials during pandemic periods.

Social risks

1. Strengthening voluntourism and food quality degradation

Problem: voluntourism can displace sustainable tourism, while the food component becomes secondary (compared to cheaper options) and unregulated.

Recommendations:

- **Develop principles of sustainable voluntourism**, including requirements for accommodation and food (environmental safety, local products).
- **Integrate a circular food component into licensing or accreditation of voluntourism programs**.
- **Create a set of guidelines for NGOs and volunteer programs** promoting responsible consumption and waste management.

Rationale**:** Interviews with business representatives and KCBTA highlighted the risks of unregulated voluntourism in high-demand destinations.

2. Loss of trust and decreased motivation for sustainability

Problem: during a crisis, people abandon long-term solutions in favour of immediate ones.

Recommendations:

- **Support local initiatives that are trusted by communities** as anchors of sustainable development (e.g. CBT groups, certified farmers) through promotion, training, small grants or inclusion in sustainable tourism marketing programs).
- **Integrate a circular approach into sustainability programs of emergency management, tourism, and food sectors**, including collaboration with NGOs. Circular solutions can be incorporated not only into planned tourism infrastructure but also into crisis response systems, temporary settlement camps, and supply logistics, particularly in mountainous areas or during emergencies. This can be achieved by leveraging local resources, reducing waste, organizing sustainable food systems at tourist facilities and camps, processing leftovers, and engaging NGOs in the local implementation of such solutions).
- **Conduct campaigns to build public confidence in sustainable practices**, including with the participation of tourists and local residents.

Rationale: The experience of GIZ and interviews with the Tourism Academy demonstrate that community engagement enhances sustainability even with limited resources.

Environmental risks

Problem: extensive and one-off solutions

Recommendations:

- Promote the use of biodegradable packaging, reusable containers, and local seasonal food solutions.
- Incorporation of a circular approach into sanitary and food standards for tourist facilities.

Governance risks

Problem: Lack of a systematic approach to sustainability in times of crisis

Recommendations:

- Integration of circular approaches into sustainability and crisis response programs (emergency management, tourism and food).
- Working with NGOs and DMOs as local sustainability and solution implementation tools.

Technological risks

While not identified as a separate category, technological aspects are indirectly present:

- The need to implement solutions for managing bio-waste, packaging, and seasonal menus requires adapting technologies to conditions of low resource availability.
- These measures are associated with low-tech but circular innovations (packaging, containers, food preservation), as opposed to the digitalization focus of Scenario 1.

Measures for scenario 3: From Water Shortages to Tensions and Problem Solving

Key vector: Water stress, rising conflict levels, tightening control over agri-food resources, and the search for technological solutions.

Environmental risks

Depletion of water resources and degradation of the food base

Problem: increasing drought and reduced water availability are worsening local food production and driving up food prices.

Recommendations:

- **Create incentives for the introduction of water-efficient technologies in tourist kitchens and suppliers** (drip irrigation, water-saving dishwashers, rainwater collection).
- **Support circular food solutions with low water loads**, such as food waste composting.
- **Develop a water sustainability labelling system for products and suppliers** (including restaurants and agricultural tourism) to inform consumers about water sustainability and encourage water conservation in the tourist chain.

Rationale: policy analysis revealed weak integration of water sustainability into the tourism sector, while interviews with Karakol DMO indicated a lack of certification and investment in sustainable food practices.

Governance risks

Politicization of resource allocation

Problem: competition between regions and sectors increases mistrust and limits cooperation.

Recommendations:

- **Create local sustainable tourism platforms** that bring together farmers, tour operators, water services, and NGOs for collaborative resource management.
- **Incorporate circular food management into climate change adaptation and tourism plans,** including at the regional level.
- **Integrate resource distribution and food availability indicators into tourism statistics to enable early detection of imbalances** (e.g., the share of local products in tourist diets, seasonal fluctuations in food prices, the level of utilization of local supply chains, the number of facilities with sustainable menus).

Rationale: policy documents lack sustainable intersectoral platforms capable of coordinating decisions at the intersection of tourism, food, and water resources. Interviews with government agencies and KCBTA show that current cooperation in these areas is limited. However, the positive experience of the Climate Change Coordination Council under the Ministry of Natural Resources and Ecology and Technical Supervision of the Kyrgyz Republic could serve as a model for creating similar mechanisms in the tourism sector.

Economic risks

Growing prices and decreasing local food availability

Problem: rising food prices reduce the attractiveness of local food and increase the share of imported food in tourism.

Recommendations:

- Develop subsidies or tax breaks for establishments that use local and water-efficient products.
- Encourage the creation of gastronomic routes and markets with an emphasis on seasonality and local resources.
- Support digital platforms that aggregate sustainable food suppliers and connect them with hotels and restaurants.

Rationale: the experience of GIZ and Green Alliance projects demonstrates that digital tools and thematic gastronomic routes can effective in boosting tourist awareness of and interest in sustainable food options.

Social risks

Conflict escalation and loss of trust

Problem: growing competition between sectors and regions leads to mistrust and social tensions

Recommendations:

- **Develop educational programs on circular economy and water management for local authorities and tourism operators.**
- To avoid conflicts with the local population, **create fair mechanisms for resource distribution with the participation of tourism businesses, including transparent and justified quotas for water use** in conditions of seasonal load and shortage.
- **Develop local peacebuilding initiatives within the framework of Tourism for Peace and Sustainability.**

Rationale**:** Interviews with the Tourism Academy and Karakol DMO show that improved education and community participation in resource management significantly reduce the likelihood of conflicts between tourists and residents. This is confirmed by research in the field of community-based tourism, where active citizen engagement and collaborative decision-making have been considered key factors in conflict management and sustainable development initiatives. [5]

Technological risks

Indirectly covered through:

- Support for digital platforms (connecting suppliers to tourist businesses).
- Introduction of water efficiency technologies in the food chain.

Measures for scenario 4: Extreme Tourism and Sector Militarization

Key vector: growth of niche adrenaline tourism, increasing inequality, weakening environmental controls, and privatization of access to natural resources.

Environmental risks

Ignoring environmental regulations for the sake of tourist income

Problem: in pursuit of revenue from extreme tourism, environmental and food regulations are undermined.

Recommendations:

- **Tighten environmental and sanitary requirements in extreme tourism areas** (for example, mountain camps, auto routes).
- Develop a register of "green operators" with access to sensitive areas while complying with standards for handling food waste and using local food.
- Establish threshold limits on the number of services/food facilities in specially protected areas.

Rationale: interviews with KCBTA and Karakol DMO reveal the pressure on ecosystems due to the growth of unorganized tourism without food regulations.

Economic risks

Over-reliance on a niche segment without sustainability measures

Problem: focus on extreme tourism decreases the sector sustainability and displaces the local food suppliers.

Recommendations:

- **Introduce quotas for the purchase of local products when organizing meals on extreme tours** (for example, provide for a minimum share of local products in the diet - as a mandatory or recommended condition for certification or state/donor support of such routes, as has been implemented in the national parks of Norway and Peru).
- **Stimulate the creation of mobile solutions for the storage and processing of food with a short shelf life, adapted to field conditions.**

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5   https://pmc.ncbi.nlm.nih.gov/articles/PMC7397974/?utm

- **Develop modular farm kitchens near tourist routes that use closed-loop principles (energy, water, waste)** through grants, technical support and integration into programs to support agricultural tourism and sustainable destinations.

Rationale**:** analysis of current policies shows poor integration of circular solutions in non-standard settings, such as mobile kitchens and organization of eco-friendly catering in mountainous and remote tourist locations.

Social risks

Growing inequality and distrust of authorities

Problem: In the context of militarization and privatization of natural resources, the local population is losing control over the territory and markets.

Recommendations:

- **Strengthen community rights through participatory mechanisms in tourism planning and food service provision** (e.g. participation in public hearings, cooperative forms of management, inclusion of representatives of CBT groups and local farmers in advisory boards when developing routes and service standards).
- **Create subsidized schemes to support local producers in extreme tourism zones.**
- **Reinforce the mandatory participation of local farmers and farms in supplying expeditions and camps under contracts.**

Rationale**:** Interviews with business associations and observations from GIZ projects indicate that manifestations of social injustice persist in the tourism sector. These include limited access for local communities to planning processes, participation in food supply chains, and a share in the economic benefits of tourism. This underscores the need to establish institutional mechanisms that ensure the equitable inclusion of communities in sustainable tourism development.

Governance risks

Prevalence of private actors and weakened control

Problem: paramilitary or private operators control food and supplies without accountability.

Recommendations:

- **Develop regulations for private tourism operators, including mandatory reporting on food sourcing and environmental standards.**
- **Promote "ethical tour operator" standards with transparent information on food chains and waste management** (e.g., disclosure of product origin, proportion of local procurement, food waste reduction policies, availability of a system for sorting and transferring leftovers for recycling or composting; such information may be published on the tour operator's website, digital tourism platforms, Travelife platform profiles, national DMO websites, or CBT directories).
- **Support independent monitoring mechanisms with civil society participation (e.g., CBT, NGOs).**

Rationale: policy analysis points to gaps in regulation of non-standard forms of tourism and a lack of control over food supply chains.

Technological risks

Covered indirectly through:

- Development of mobile and modular solutions for storing, processing and preparing food in non-standard conditions (for example, in the mountains), which requires technical adaptations and innovations.

Preferred scenario analysis − "Find Your Place in the Nomad Culture"

Focus: development of sustainable tourism based on cultural heritage and circular economy, including the food component

Risks

Economic risks

- **High prices for sustainable food products**

  Development of local production and environmentally friendly products may be accompanied by rising prices, limiting access for both low-income domestic tourists and mass tourism. This reduces inclusivity and may hinder circular solutions scale-up.

- **Fiscal implications of sustainable measures**

  Providing tax incentives or subsidies for sustainable producers may reduce government revenue. Introducing new levies (such as a tourist tax) may create a negative reaction among consumers and investors and hinder the advancement of CE initiatives.

Social risks

- **Exclusion of small producers due to certification requirements**

  Pressure to comply with environmental or circularity standards without support can marginalize seasonal, family or nomadic farms that do not have enough resources to achieve formal certification.

- **Conflicts with local communities due to restricted access to natural sites**

  Restricting visits to specially protected or vulnerable areas as part of sustainability policies may cause discontent among local residents for whom tourism is a key source of income.

Governance risks

- **Technological and staffing unpreparedness for digital and circular tools**

  Promoting digital solutions for resource tracking, sustainable food planning, and waste reduction requires skills and IT infrastructure that may be lacking at the local level, particularly in remote areas.

- **Institutional barriers and overload of the new regulatory architecture**

  Creating new tourism authorities or introducing new policies without proper coordination and staffing can lead to delays, ineffective implementation of reforms and loss of trust from businesses and communities.

Environmental risks

- **Increased environmental impact from local tourism without sustainable infrastructure**

  Increasing tourist flows to non-mass cultural sites without appropriate waste and water management solutions can undermine the sustainability of ecosystems and contradict the CE goals.

Technological risks

- **Digital inequality and lack of service infrastructure**
  - Unequal access to digital solutions and technical support across regions (especially in high-altitude destinations).
  - Lack of service centers and equipment suppliers (e.g., for bio-sanitary solutions, energy-efficient refrigerators, etc.).
  - Risk of dependence on imported technologies without support and maintenance.
  - Lack of a unified digital platform for traceability of sustainable products and logistics.

Below are **policy recommendations** for addressing the risks in the preferred *Find Your Place in the Nomad Culture* scenario linked to **findings from interviews and policy analysis**.

Policy recommendations by risk category in a preferred scenario

1. Economic risks and recommendations

High prices for sustainable food products

Risks:

- Sustainable, locally manufactured products (organic, seasonal) can be more expensive than mass-produced imported alternatives.
- This limits access to CE tourism for low-income tourists and reduces the economic sustainability of businesses.

Recommendations:

- **Introduce subsidies or tax incentives for producers and suppliers of local and sustainable products** (for example, through inclusion in the Program for the Development of the Agro-Industrial Complex of the Kyrgyz Republic, the State Program for the Development of Regions, the National Strategy for Food Security, as well as in measures for implementing the *Kyrgyzstan - a Green Economy Country* Program).
- **Support cooperative marketing models** (such as food cooperatives, suggested as a potential solution in interviews with KCBTA and Karakol DMO) that bring together farmers and hotels.
- Develop **sustainable public procurement systems** (in accordance with Resolution No. 489 and Law No. 27 on public procurement) in favor of local agricultural and gastronomic producers in tourism clusters.
- Expand access to **green finance** through the Green Innovation Fund (based on GIZ model), with a focus on food solutions.

Fiscal implications of sustainable measures

Risks:

- Providing tax incentives and subsidies to support sustainable development practices can reduce government revenues, especially at the local level.
- The introduction of additional taxes or fees (such as a sustainable development tax) can be perceived as a barrier by tourists and investors, reducing the attractiveness of destinations.

Recommendations:

- **Introduce compensatory fiscal mechanisms**: for example, direct a portion of revenues from existing taxes (VAT on hotel services, excise duties, etc.) to target funds to support CE initiatives.
- **Test voluntary sustainable financing instruments** (e.g., a green tourist levy as a booking option) to study behavioral responses and prepare for the possible introduction of mandatory mechanisms.
- **Attract donor funds and public-private partnership (PPP) mechanisms** to subsidize pilot CE projects, especially in remote areas.
- **Incorporate sustainable solutions into existing tourism and infrastructure development programs** to avoid creation of new expenditure items and repurpose existing ones.
- **Develop an economic justification and a calculator for the impact of CE implementation** (e.g., reduction of waste disposal costs, generation of jobs) to justify the policy to the Ministry of Finance and investors.

2. Social risks

Exclusion of small producers due to certification requirements

Risks:

- Certification and standardization requirements can be overwhelming for seasonal or family farms, especially in remote areas.

Recommendations:

- Introduce **adapted forms of certification** suitable for SMEs and family producers (e.g. "light certification" or phased implementation), as suggested in interviews with PERETO and KCBTA.
- Create **government-NGO mentoring platforms** where sustainable hotels and restaurants share experience with beginners.
- Support **tourism associations programs (e.g., HoReCa, KCBTA)** to promote "green branding" without mandatory certification.
- Use elements of **public recognition** (directories of sustainable suppliers, as planned by DMO and the Ministry of Tourism).

Conflicts with local communities due to restricted access to natural sites

Risks:

- Restrictions on visiting specially protected areas and vulnerable ecosystems may be perceived by local populations as a threat to their livelihoods, especially if tourism is the primary source of employment.
- The lack of community involvement in decision-making increases mistrust and can lead to non-compliance with restrictions.

Recommendations:

- **Implement mechanisms for joint management of natural areas with the participation of local communities,** as provided for in the community-based tourism (CBT) model.
- **Involve community representatives in the development of tourist routes and zoning**, ensuring transparency and taking into account their interests.
- **Provide alternative sources of income for local populations**, including participation in environmental projects, cultural events, and the creation of services (transportation, food, souvenirs) outside protected areas.
- **Provide a compensation mechanism** (e.g., through targeted funds or grants) if restrictive measures objectively impact family revenues.
- **Invest in training and retraining local guides and tourism providers in sustainable formats** (eco tours, gastronomic tourism, cultural events).
- **Use educational tools** (through DMOs, CBT, and school programs) to raise awareness of the importance of conservation measures as a long-term investment in the sustainability of the destination.

3. Governance risks

Technological and staffing unpreparedness

Risks:

- Lack of skills and access to digital tools in food resource management, waste management, and energy efficiency in accommodation and food service settings.

Recommendations:

- Develop **short-term courses** (1−3 days) for tourist facility employees in collaboration with the Tourism Academy and GIZ.
- Implement **digital templates for sustainable menu planning, procurement, and reporting**, accessible offline for remote regions (see Karakol DMO cases).
- Support the creation of **local competence centers** at DMOs and colleges, following the model of Karakol DMO and the Tourism Academy.
- Integrate **circular economy modules into the retraining system for civil servants and tour operators**.

Institutional barriers and overload of the new regulatory architecture

Risks

- Establishment of new management structures (e.g., a sustainable tourism agency) without prior capacity and resource assessment can lead to duplication of functions, conflicts of authority, and regulatory overload.
- A lack of qualified personnel and coordinated implementation of new regulations reduces the effectiveness of policy implementation and leads to mistrust from the private sector and communities.

Recommendations:

- **Assess institutional readiness to implement new structures and regulations**, including staff capacity, coordination mechanisms, and interagency collaboration (e.g., through audits or pilot projects).
- **Use a phased approach to introducing new authorities or regulations**, starting with pilot regions or key tourism destinations to test mechanisms in practice, take into account regional specificities, and minimize the risk of institutional overload before scaling up to the national level.
- **Provide professional training and retraining for the staff of new authorities** (including through partnerships with the Tourism Academy, donor programs, and international NGOs).
- **Designate a coordinating body or platform** (e.g., an Interagency Working Group) to align objectives and regulations between ministries, DMOs, CBT, and other actors.
- **Engage private sector and community representatives in advisory boards during the development and implementation of new policies** to enhance legitimacy and practical applicability.
- **Use digital solutions** (portals, databases, online templates) **to simplify regulations and minimize the administrative burden on businesses**.

4. Environmental risks

Increasing pressure on the natural environment

Risks:

- Tourism to non-mass-market natural and cultural sites lacking proper infrastructure can lead to increased waste, excessive water use, and land degradation.

Recommendations:

- When developing new routes, consider **environmental zoning and load limits** (see the policy on specially protected areas, interview with the Ministry of Tourism).
- **Within the public-private partnership (PPP) projects, consider the installation of sanitation infrastructure, organic waste recycling, and local energy supply** (see the interview with the PPP Center and the policy of the State Program for Regional Development).
- **Support mini-projects of NGOs and DMOs aimed at installing composters, bio-toilets, and water-saving solutions in tourist facilities** (e.g., through microgrants, technical support, priority in regional development programs, and assistance in obtaining permits).
- **Include eco-criteria in regional grant competitions funded by donors or local akimats** (e.g. availability of a waste sorting system, use of local and seasonal products, energy efficiency of equipment, implementation of water-saving solutions, sustainable food in accommodation facilities).

5. Technological risks

Digital inequality and lack of service infrastructure

Risks:

- Unequal access to digital and technological solutions in remote areas;
- Lack of service and logistics support for sustainable technologies;

- Technological dependence on imported products without local support;
- Lack of digital platforms and sustainable supply traceability systems.

Recommendations:

- **Development of digital infrastructure and traceability platforms:**
  - **Create and implement a national digital platform for tracking sustainable food products and tourism services** with the ability to use blockchain technology to document supply chains and QR code labeling, with open access to information on origin, production methods, and environmental characteristics
  - Include sections in the platform to track product origin, eco- or organic certification, seasonality, supply chain route, and packaging type. (The Ministry of Economy and Trade of the Kyrgyz Republic or the Ministry of Agriculture of the Kyrgyz Republic could operate such a platform, in partnership with destination management organizations (DMOs) and industry supplier associations.)
- **Localization and support of service chains:**
  - Support the creation of local service centers and the distribution of sustainable tourism technologies (e.g., the supply of composting toilets, solar panels, food dehydrators, etc.);
  - Introduce subsidies or grants for local entrepreneurs providing installation and maintenance services for sustainable technologies.
- **Support for technological adaptation of SMEs:**
  - Develop targeted programs (including with donor participation) to train SMEs in the use of digital solutions: waste management, water and energy metering, food supply monitoring, etc.;
  - Implement mobile consulting services for high-mountain and remote areas to demonstrate and support digital solutions (e.g., through collaboration with the Academy of Tourism, DMO, agricultural colleges, local NGOs, and GIZ projects).
- **Import substitution and localization of technology production:**
  - Stimulate pilot projects to localize equipment assembly (e.g., in collaboration with universities and businesses: production of biodegradable packaging, eco-stoves, and solar-powered refrigeration units);
  - Create incentive quotas in government programs and procurement, as well as in international donor projects, for the acquisition of locally produced green technologies – for example, by setting priorities or minimum shares in financing, tenders, and grant competitions.
- **Integration of digital solutions in the sustainable tourism policy:**
  - Update strategic tourism documents to include mandatory or encouraged digitalization of sustainable food chain processes (e.g., as part of eco-certification or government support requirements);
  - Support the development of digital labeling standards to ensure tourists are informed about the sustainability of products offered.

Integrating risks and recommendations from alternative scenarios into the preferred scenario policy

An analysis of four alternative scenarios allowed us to identify both general and specific risks to the development of a circular economy in tourism, focusing on the food component. Although these scenarios are not the desired development trajectories, the risks and responses developed for them can significantly **enhance the resilience and adaptability of the preferred scenario** - *Find Your Place in the Nomad Culture.*

Arguments for integration:

- **Systemic vulnerabilities recur:** Limited infrastructure, unequal access to sustainable products, poor information, and other risks are cross-cutting and relevant across all scenarios.
- **Alternative scenarios provide preventive lessons:** e.g. scenarios involving militarization or water scarcity help identify vulnerabilities and propose measures to prevent losses in inclusiveness and resilience.

- **Which policies are chosen for adaptation:** Approaches related to training, digitalization, support for farmer cooperatives, or anti-crisis measures strengthen components of sustainable gastrotourism and can be integrated into the preferred scenario.

How it is applied

Such elements as subsidies for local food producers (scenario 3), coordination platforms between government and business (scenario 1), anti-crisis measures for food chains (scenario 2), and community participation in resource management (scenario 4) were taken into account and partially integrated into the recommendations for the preferred scenario, strengthening its environmental friendliness, social inclusiveness, and resilience to shocks.

Additional risks from the four scenarios

Additional risks relevant to the *Find Your Place in the Nomad Culture* **preferred scenario** can be identified based on an analysis of four alternative scenarios. These risks **complement** those already identified and help make the scenario more resilient. They are categorized below.

Additional risks complementing the preferred scenario

1. Economic risks

- **Instability of local supplies**: As shown by scenario 2 (*Resilience in a Crisis*), during periods of shock, a reduction in the flow of tourists and a disruption in the supply of local products are possible, especially in remote areas.
- **Overemphasis on niche or elite formats** (scenario 4): gastronomic tours may remain accessible only to a narrow segment of tourists, which undermines inclusiveness and the widespread adoption of CE principles.

2. Social risks

- **Unequal access to sustainable food** (scenario 1): sustainable products can remain too expensive for a number of tourists and local population.
- **Community fatigue from engagement with no returns** (scenario 2): without a well-designed system of compensation or support, the population may lose motivation to participate in green initiatives.

3. Governance risks

- **Poor local-level coordination** (scenario 2): local governments may be unable to perform their role as integrators of sustainable practices in tourism.
- **Gaps in regulation of standards** (scenario 1): The lack of flexible standards for small farmers and food businesses could lead to their exclusion from green chains.

4. Environmental risks

- **Excessive load on ecosystems**: as in scenario 4 (*Extreme Tourism*), With the growing popularity of ethnotourism, degradation of pastures, littering and deterioration of sanitary conditions in high-traffic areas are possible.
- **Risks of biodiversity loss** with the expansion of agricultural production without sustainable planning (scenario 3 – *Water Shortages*).

5. Technological risks

- **Insufficient digitalization (especially in regions)** (scenario 1): The lack of digital tools for monitoring and visualizing environmental practices reduces transparency and trust.
- **Limited access to sustainable technologies in regions** (scenarios 2 and 3): High prices and a shortage of technical specialists are hindering scale-up of solutions.

These risks **do not exclude, but rather complement** those previously identified in the preferred scenario and can be used as a basis for expanding recommendations on policy, infrastructure, education, and business incentives.

Adaptation of measures for additional risks within the preferred scenario

For each of the additional risks selected from the alternative scenarios, policy measures were previously developed in the relevant context (Scenarios 1-4). However, when integrating these risks into the preferred scenario *"Find Your Place in the Nomad Culture"*, they require adaptation. Such adaptation:

- **does not replace** the previously proposed measures, but rather **complements** them**;**
- reflects the **specifics of the preferred scenario** - an emphasis on cultural identity, community engagement, and the development of local value chains;
- ensures a **proactive and sustainable approach**, in contrast to the anti-crisis or conflict-driven logic of the alternative scenarios.

Below are explanations of each risk and suggested policy modifications based on the preferred scenario.

1. Economic risk: Instability of local supplies

Source: scenario 2 (*Resilience in a Crisis*)

Problem: In times of crisis, supply chains are disrupted, especially in remote areas.

Adaptation rationale: In the preferred scenario, the focus shifts from anti-crisis measures to the sustainability of seasonal supplies and their integration into cultural tourism products.

Adaptation details: Previously proposed measures (public procurement, logistics, cooperation) remain relevant. However, in the context of the preferred scenario, the emphasis should be on **institutionalizing sustainable relationships between CBT/DMOs and suppliers**, as well as on **engaging food businesses in cultural tourism products** through contracts with pre-order elements, flexible according to season.

Adapted policies for the preferred scenario:

- Implementation of long-term contract mechanisms between CBT/DMOs and agricultural suppliers.
- Creation of local distribution hubs along tourist routes (for packaging, storage, and redistribution of sustainable products).
- Integration of suppliers into cultural tourism products (cultural routes and hospitality programs).
- Inclusion of local producers in sustainable public procurement (especially for camps and events).

2. Economic risk: Overemphasis on niche or elite formats

Source: scenario 4 (*Extreme Tourism and Sector Militarization*)

Problem: Sustainable gastronomic offers remain accessible mainly to wealthy tourists, excluding the general population and local producers.

Adaptation rationale: The preferred scenario places a greater emphasis on accessibility and broad community engagement. Sustainable gastronomic initiatives should be integrated into cultural tourism and intangible heritage.

Adaptation details: Previously proposed measures focused on balancing demand. In the preferred scenario, these measures are strengthened through the **integration of popular gastronomic routes into cultural tours**, the promotion of simple, sustainable dishes, **and subsidies for SME participation in events**.

Adapted policies for the preferred scenario:

- Developing and promoting "popular food routes" in collaboration with CBTs and farmers.
- Introducing affordable sustainable food packages (eco-breakfasts, simple seasonal dishes).

- Supporting participation of SMEs and farmers in food festivals and cultural events.
- Promoting simple dishes as part of the intangible heritage through guides, marketing, and cultural programs.

3. Social risk: Unequal access to sustainable food

Source: scenario 1 (*New Professionals – New Approaches*)

Problem: Sustainable food remains inaccessible to local residents and low-budget tourists, reducing the overall impact of sustainable practices.

Adaptation rationale: The preferred scenario emphasizes cultural integration and inclusion of all segments of the population. Eco-food should be perceived as part of local culture, understandable, and socially inclusive.

Adaptation details: Policies remain relevant, but require a link to cultural integration – for example, through the **introduction of green breakfasts at ethno-tourist sites, the inclusion of eco-dishes in school and youth cultural programs, and food packages that reflect local gastronomic culture** in affordable formats.

Adapted policies for the preferred scenario:

- Cross-subsidization programs (part of the premium income is used to reduce the cost of basic services).
- Development of cooperative kitchens and accessible gastro-hubs at CBTs and DMOs.
- Introduction of green breakfasts and simple dishes into the tourism infrastructure.
- Integration of eco-friendly food practices into educational programs (school and youth programs in the regions).

4. Social risk: Community fatigue of engagement with no tangible benefits

Source: scenario 2

Problem: The lack of tangible financial or non-material returns reduces the motivation of local communities to participate in the development of sustainable tourism and gastronomic projects.

Adaptation rationale: In the preferred scenario, sustainability is impossible without the active and committed participation of communities. Therefore, measures should not only offset costs but also strengthen the recognition and role of communities as co-creators of cultural tourism products.

Adaptation details: Compensation and support measures should be integrated into **local brands, small grant programs, and sustainable heritage festivals** to ensure both economic and symbolic impact for communities. Institutionalizing participation in planning, develop non-material incentive systems, and emphasize culinary heritage as a source of cultural value and income.

Adapted policies:

- Introducing micro-grant programs and flexible support for communities (linked to local brands).
- Expanding community participation in tourism product development and decision-making.
- Integrating cultural festivals and recognizing community contributions to sustainable tourism development.

5. Governance risk: Poor local-level coordination

Source: scenario 2

Problem: Local structures operate in an uncoordinated manner, which reduces the sustainability of tourism initiatives and hampers the integration of local solutions.

Adaptation rationale: For the preferred scenario, it is important to strengthen the coordinating role of the DMO and CBT without creating new structures.

Adaptation details: Instead of creating new platforms, **DMOs should be strengthened as cultural-ecological**

integrators and coordinators with a mandate for food, infrastructure, and marketing including circular economy elements.

Adapted policies:

- Strengthen the role of DMOs as coordinators of sustainable culture and food tourism.
- Upgrade the skills of DMO personnel and include intersectoral cooperation mechanisms.
- Develop food and infrastructure planning tools at the municipal level.

6. Governance risk: Gaps in regulation of standards

Source: scenario 1

Problem: Small producers and informal food service providers are not covered by current sustainability standards and certification, which limits their participation in green initiatives.

Adaptation rationale: The preferred scenario requires flexibility in regulation to allow for the inclusion of local and informal food-related initiatives.

Adaptation details: The previously proposed measures could be supplemented by **voluntary green standards based on traditional practices**, as well as **inclusive certification** that takes into account informal types of food businesses (home kitchens, seasonal food outlets).

Adapted policies:

- Development of voluntary green standards adapted to small businesses and local practices.
- Simplified certification of home-based food, seasonal outlets, and farm-based catering services.
- Recognition of traditional recipes and practices as the basis for sustainable food standards.

7. Environmental risk: Excessive load on ecosystems

Source: scenario 4

Problem: Increased tourist activity leads to degradation of pastures, pollution of water bodies and accumulation of waste, especially in remote and ecologically vulnerable locations.

Adaptation rationale: The preferred scenario focuses on small-scale tourism, allowing for a focus on preventative and educational measures aimed at reducing environmental impacts.

Adaptation details: Along with restrictions on tourist loads, it is important to focus on **pollution prevention, educating tourists on the code of conduct and eco-menus on the routes**, taking into account pasture and water sustainability.

Adapted policies:

- Conduct an inventory of tourist sites and destinations to determine restrictions for each of them.
- Introduce restrictions on tourist loads in ethnic locations and pasture zones.
- Mandatory sorting and disposal of food waste in temporary tourist accommodation areas.
- Eco-menus and educational campaigns for tourists on rules of conduct and nutrition in nature (development of a code of conduct and installation of information signs on behavior requirements in each location)

8. Environmental risk: Biodiversity loss due to expansion of agricultural production

Source: scenario 3 (*Water Shortages*)

Problem: The expansion of food production for tourism may lead to the displacement of traditional agroecosystems, reduction of biodiversity and degradation of natural areas.

Adaptation rationale: In the preferred scenario, it is important to preserve natural and cultural diversity.

Therefore, measures should focus on supporting biodiverse farms and environmentally responsible expansion of production.

Adaptation details: Focus on **agricultural diversity within tourist routes, e.g. demonstration gardens and plant nurseries at ethno-tourist sites; subsidies only for environmentally justified** expansion of agricultural production.

Adapted policies:

- Promoting agrodiversity as part of the tourism product (demonstration farms and vegetable gardens).
- Conditional subsidies for production expansion - only with sustainable land use.
- Monitoring agricultural expansion near tourist routes, taking biodiversity into account.
- Improving the efficiency of agricultural production

9. Technological risk: Inadequate digitalization in regions

Source: scenario 1

Problem: Low levels of digital infrastructure and skills limit the use of online systems for sustainable tourism and food supply management in many regions of Kyrgyzstan.

Adaptation rationale: In the preferred scenario focused on small-scale initiatives and local routes, it is important to offer flexible solutions – including offline tools and visual formats – to increase the accessibility of digital tools and support their local use.

Adaptation details: It is important to develop **digital showcases of local suppliers** and **maps of sustainable routes** in an offline format (for regions with poor internet access), including **infographics on CE solutions**.

Adapted policies:

- Development of offline maps and digital showcases of local suppliers.
- Visualization of CE solutions in the format of route panels, guides, and applications.
- Support for digital literacy among farmers and tour operators.

10. Technological risk: Limited access to sustainable technologies

Source: scenarios 2 and 3 (*Resilience in a Crisis* and *Water Shortages*)

Problem: With limited access to investment and local resources, many forms of sustainable technological solutions (composting, water conservation, packaging recycling, etc.) are inaccessible to small-scale tour operators and farmers.

Adaptation rationale: Simple, accessible, and locally applicable CE solutions play a particular role in the preferred scenario. Their dissemination requires not only the provision of equipment, but also localization of knowledge, creation of sharing mechanisms, and linkage to cultural tourism products.

Adaptation details: We propose **localization of solutions** through training centers at CBT and **creation of basic sets of circular solutions** (**mobile kitchens, composters, etc.**) available for rent.

Adapted policies:

- Creation of libraries or rental centers of sustainable solutions (mobile kitchens, composters, etc.).
- Training modules at CBT and DMOs on the use of low-cost CE technologies.
- Localization of production or equipment assembly taking into account the needs of seasonal and low-budget tourism.

Comprehensive list of measures for the preferred scenario broken down by implementation timeline

This section presents a unified consolidated list of risks and policy measures for the preferred *Find Your Place in the Nomad Culture* scenario.

The list includes both the **original risks** from the scenario itself and **additional risks** (marked as (*additional*)) borrowed from alternative scenarios.

Furthermore, **to more realistically and accurately address the pressing issues already observed in the sector**, the list also includes **risks directly identified during stakeholder interviews** (marked as (*interview*).

Each measure is provided with an **estimated implementation timeline**, allowing for variations in implementation complexity, institutional requirements, and resource availability.

Approach to divide policy recommendations for a preferred scenario into short-, medium-, and long-term measures

The division of policy recommendations for the preferred scenario into **short-term, medium-term and long-term** measures in the context of Kyrgyzstan is done according to the following criteria:

Preparedness for implementation (institutional, technical, financial) and the **time required for a visible effect.**

Implementation timeline categories

- **Short-term (1-2 years)** - launching quick solutions, changing procedures, consultations, and small pilots. Such measures can be implemented by existing DMOs, CBTs, NGOs, or local authorities. They do not require legislative changes and produce a quick impact, helping to build trust and demonstrate initial results.
- **Medium-term (3-5 years)** - developing sustainable programs, institutionalizing successful practices, and expanding pilot initiatives to other regions. Often require coordination across multiple levels of government and additional funding.
- **Long-term (6+ years)** - measures aimed at creating infrastructure, sustainable markets, and changing behavior. Typically associated with investments, legislative changes, and systemic transformations.

This categorization allows:

- **Phased policy implementation**, starting from achievable steps;
- **Ensuring quick wins** through short-term measures;
- **Establishing systemic transformation** through long-term actions.

Below is a summary list of risks and corresponding policy measures selected to implement the preferred scenario, taking into account both current reality and potential future challenges. An expected implementation timeframe is identified for each measure - short-, medium-, or long-term—and a brief explanation justifying its classification. This proposed format allows for the development of a **realistic and phased trajectory for implementing circular economy principles** in the tourist sector**,** with a focus on food—from short-term achievable steps to systemic change.

Consolidated list of risks and corresponding policy measures

Economic risks and measures

1. High prices for sustainable food products (preferred scenario)

Measures:

- Subsidies or tax incentives for producers and suppliers of local and sustainable products (*medium-term - requires approval through government programs and fiscal instruments*)

- Support for cooperative marketing models (food cooperatives uniting farmers and hotels) (*medium-term - requires organizational support and program integration*)
- Development of sustainable public procurement systems in tourist clusters (*medium-term - possible implementation through existing public procurement mechanisms*)
- Expanding access to green finance through the Green Innovation Fund (GIZ model) (*medium-/long-term - requires donor support and a sustainable financial model*)

2. Fiscal implications of sustainable measures (from the preferred scenario)

Measures:

- Introduction of compensatory fiscal mechanisms: redistribution of a portion of revenues from existing taxes (e.g., VAT on accommodation services) into special funds to support CE initiatives (*medium-term - requires coordination with the Ministry of Finance and adaptation of budgetary procedures*)
- Testing voluntary "green fee" mechanisms (e.g., as an option for online bookings) with subsequent analysis of tourist behavior (*short-term - possible piloting through CBT and DMO*)
- Attracting donor funding and PPP to subsidize the implementation of circular economy practices in pilot locations (*short-term - requires intensified interaction with donors and the PPP Center*)
- Integration of CE solutions into existing government programs (e.g., development of infrastructure, tourism, and agro-industrial complex) with the redistribution of existing budgets (*medium-term - possible through revision of program documents*)
- Development of a calculator for the economic impact of circular economy implementation to justify subsidies and investments (e.g., through waste reduction and job creation) (*long-term - requires interdepartmental cooperation and analytical study*)

3. Uneven engagement of local suppliers (interview)

Measures:

- Standardization of requirements for local suppliers, taking into account regional specifics (*medium-term - requires approval and implementation through regulations*)
- Transparent criteria for access to tourism procurement (*short-term - possible implementation through current procurement mechanisms*)
- Raising awareness and consulting support for agro-business (*short-term - can be launched quickly through NGOs and DMOs*)

4. Lack of incentives for the use of sustainable products (interview)

Measures:

- Introducing bonuses in tenders for the use of local and sustainable products (*medium-term - requires changes to procurement systems*)
- Grants for SMEs using CE approaches (*medium-term - requires an administrative mechanism*)
- Support for pilot green box models (example: CBT Karakol) (*short-term - can be implemented based on existing CBTs*)

5. Instability of local supplies (additional)

Measures:

- Long-term contracts between tourist facilities and agricultural suppliers (*medium-term - requires time to develop trust and mechanisms*)
- Creation of district food redistribution centers (*long-term - requires investment and logistics planning*)
- Inclusion in sustainable government procurement and anti-crisis reserves (*medium-term - possible through updating government programs*)

6. Overemphasis on niche and elite formats (additional)

Measures:

- Creating "popular food routes" with CBTs and farmers (*medium-term - requires methodology and cross-sectoral collaboration*)
- Developing accessible eco-menus and gastronomic maps (*short-term - possible to implement with DMOs and CBTs in the current season*)
- Subsidies for small farms to participate in food festivals (*medium-term - dependent on budgeting and program support*)

Social risks and measures

7. Exclusion of small producers due to certification requirements (preferred scenario)

Measures:

- Implementation of adapted certification forms (light certification, phased approaches) (*medium-term - requires institutionalization, but not legislative changes*)
- Creation of mentoring platforms based on NGOs and tourism associations (*short-term - can be launched with the support of HoReCa, CBT, KCBTA*)
- Promotion of green branding without mandatory certification through associations (*short-term - implementation possible through existing NGO and association programs*)
- Elements of public recognition - directories of sustainable suppliers (*medium-term - requires communication support and partnership with the DMO/Ministry of Tourism*)

8. Conflicts with local communities due to restricted access to natural resources (preferred scenario)

Measures:

- Implementing mechanisms for co-management of protected areas with the participation of local communities (*medium-term - requires changes to the regulatory framework and support from CBT/DMOs*)
- Involving local community representatives in route planning, zoning, and development of restrictions (*short-term - can be implemented through consultations with the support of NGOs and DMOs*)
- Developing alternative forms of income: crafts, cultural tours, gastronomy, transportation, and food outside specially protected areas (*medium-term - requires support with grants and from local akimats*)
- Creating mechanisms for compensating or supporting families affected by restrictions through local target funds or donor programs (*long-term - requires sustainable funding*)
- Supporting retraining and training programs in sustainable tourism (ecological tours, green entrepreneurship) (*short-term - possible through the Tourism Academy and NGOs*)
- Information campaigns on the benefits of nature conservation for destination sustainability (*short-term - implemented through CBT, school lessons, DMOs, and tour operators*)

9. Poor integration of local communities in tourism management (interview)

Measures:

- Expanding community participation in route and food planning (*medium-term - requires the development of participation and consultation mechanisms*)
- Developing a "community gastro-hub" model within DMOs and CBT (*long-term - requires infrastructure and sustainable support*)
- Supporting rural brands through local tourist products (*medium-term - requires promotion and marketing campaigns*)

10. Unequal access to sustainable food (additional)

Measures:

- Cross-subsidizing: revenue from premium tours for affordable meal (*medium-term - requires a financial model and administration*)
- Support for community kitchens and food hubs (*long-term - requires ongoing funding and local coordination*)
- Incorporating sustainable food into school and youth programs (*medium-term - implementation possible through training courses and sessions)*

11. Community fatigue from engagement with no returns (additional)

Measures:

- Flexible micro-support and grants for engaged participants (*short-term - can be implemented through existing donor programs*)
- Recognizing community contributions through cultural events (*short-term - easily integrated into current events and celebrations*)
- Incentives for promoting locally branded green products (*medium-term - requires branding and marketing development programs)*

Governance risks and measures

12. Technological and staffing unpreparedness (from the preferred scenario)

Measures:

- Development of short-term courses (1–3 days) for tourist facility employees - in collaboration with the Tourism Academy and GIZ (*short-term - rapid implementation possible at existing educational institutions*)
- Implementation of digital templates for sustainable menu planning, procurement, and reporting, accessible offline for remote areas (*medium-term - requires technical adaptation and piloting*)
- Support for the creation of local competence centers at DMOs and colleges (*medium-term - requires institutional partnership and core funding*)
- Integration of circular economy modules into the retraining system for civil servants and tour operators (*long-term - requires coordination with government agencies and curriculum revision*)

13. Institutional barriers and overload of the new regulatory architecture (from the preferred scenario)

Measures:

- Conducting an institutional audit before creating new bodies or launching reforms (*short-term - can be implemented with the support of international partners*)
- Phased implementation of new regulations and structures, starting with pilot regions and destinations (*medium-term - requires interdepartmental approval*)
- Training and professional development programs for personnel in new sustainable tourism structures (*medium-term - possible through the Tourism Academy, GIZ, and other donors*)
- Creating a coordinating platform or interdepartmental working group to coordinate tasks and regulations (*short-term - requires political will and administrative decision*)
- Forming advisory councils with the participation of businesses and communities under ministries or DMOs (*medium-term - can be implemented through bylaws or engagement programs*)
- Implementing digital tools for managing regulatory workloads: templates, online portals, automated reporting (*medium- and long-term - requires IT development and testing*)

14. Lack of mechanisms for coordinating efforts between DMOs, CBT and local authorities (interview)

Measures:

- Strengthening DMOs as interaction platforms (*medium-term - requires institutional alignment and trust between participants*)
- Regular policy planning sessions at the local level (*short-term - can be launched based on existing coordination formats*)
- Standards for coordination and division of powers (*medium-term - requires legal and administrative formalization*)

15. Poor local-level coordination (additional)

Measures:

- Improving the skills of local specialists (*medium-term - possible through short courses and targeted training*)
- Establishing district coordination groups under the DMO (*medium-term - requires basic organizational support and staffing*)
- Planning routes and meals taking into account workloads and logistics (*long-term - requires system data and regular monitoring*)

16. Gaps in regulation of standards (additional)

Measures:

- Voluntary standards for small food businesses (*medium-term - can be developed jointly with associations and experts*)
- Simplified certification of local food formats (*long-term - requires piloting, a legal framework, and market recognition*)
- Recognition of traditional recipes as the foundation of sustainable practices (*medium-term - can be implemented through registries, guides, and marketing campaigns*)

Environmental risks and measures

17. Increasing pressure on natural environment (preferred scenario)

Measures:

- Environmental zoning and load limits when developing new routes (*medium-term - requires coordination with environmental authorities and an analytical base*)
- Infrastructure for PPP projects: bio-toilets, organic waste recycling, local energy supply (*long-term - requires design, approvals, and capital investment*)
- Support for mini-projects of NGOs and DMOs (composters, water-saving solutions) (*short-term - possible through small grants and existing initiatives*)
- Inclusion of eco-criteria in donor and local grant competitions (*medium-term - requires adjustment to competition criteria and applicant outreach*)

18. Increasing food waste in mass tourism (interview)

Measures:

- Mandatory requirements for sorting and recycling at accommodation facilities (*medium-term - requires development of a regulatory framework and control system*)
- Support for the implementation of composters and circular solutions (*medium-term - possible through grants, training, and demonstration projects*)
- Training programs for the staff (*short-term - implemented through partnerships with NGOs, DMOs, and CBT*)

19. Excessive load on ecosystems (additional)

Measures:

- Introducing visitor limits for sensitive routes (*long-term - requires assessment of permissible load and approval from specially protected areas and authorities*)
- Promoting tourist behavior through guides and eco-menus (*short-term - can be launched immediately using printed and online materials*)
- Mandatory environmental assessment when planning new food outlets (*medium-term - integration into permission and design processes*)

20. Biodiversity loss with the expansion of agricultural production (additional)

Measures:

- Conditional subsidies for production while adhering to environmental principles (*medium-term - requires development of criteria and coordination with agricultural policy*)
- Promotion of agricultural diversity through agricultural tourism (*short-term - possible through pilot routes and marketing*)
- Monitoring pressure on ecosystems (*long-term - requires ongoing data and analytical mechanisms*)

Technological risks and measures

21. Digital inequality and lack of service infrastructure (preferred scenario)

Measures:

- National digital platform for traceability of products and services (*long-term - requires architecture, integration with certification, and sustainable funding*)
- Local service centers for sustainable technologies (*medium-term - possible through grants and collaboration with NGOs/SMEs*)
- Grants and subsidies for the installation and maintenance of green technologies (*medium-term - requires administration and donor participation*)
- Digital training programs for SMEs (water, waste, food) (*medium-term - implemented through colleges, partnerships with NGOs and DMOs*)
- Mobile advisory services for remote areas (*medium-term - requires logistics, personnel, and technical support*)
- Pilot projects for equipment assembly and import substitution (eco-ovens, packaging) (*long-term - requires industrial partners and demand stimulation*)
- Standards for digital labeling and marking of sustainable products (*medium-term - can be included in certification policies and grant programs*)

22. Lack of knowledge and access to sustainable technologies among small operators (interview)

Measures:

- Development of handbooks on CE solutions for the food business (*short-term - can be implemented with partner support within a year*)
- Mentoring and demonstration project programs (*medium-term - requires expert recruitment, participant selection, and pilot launch*)
- Mobile training labs at DMOs (*medium-term - requires funding and logistics, but has high scalability potential*)

23. Inadequate digitalization (additional)

Measures:

- Creating offline access to gastronomic routes (*short-term - implemented through printed maps, QR codes, and simple apps*)
- Developing digital showcases and navigation for local suppliers (*medium-term - requires IT development and data collection*)
- Improving digital literacy among SMEs (*medium-term - possible through courses included in business support programs*)

24. Limited access to sustainable technologies (additional)

Measures:

- Equipment access centers (rental, assembly) (*long-term - requires investment, partners, and sustainable business models*)
- Modular training courses (*medium-term - can be launched at colleges, DMOs, or NGOs*)
- Local production of mobile solutions (*long-term - requires preparation of a production base and demand stimulation*)

Conclusion

Implementation of circular economy principles in the tourism sector of Kyrgyzstan with a focus on the food component is a strategically important area for achieving sustainable, inclusive, and climate-resilient development of the country. This study combined an analysis of current policies, interviews with key stakeholders, and a foresight workshop on development of scenarios to identify both barriers and opportunities for transitioning to a circular model.

Such a multi-layered approach allowed us to formulate a substantiated set of risks and policy measures within the preferred *"Find Your Place in the Nomad Culture"* scenario, which emphasizes local resources, sustainable food, and cultural identity. The proposed measures set a strategic trajectory for the sustainable transformation of the tourism industry.

Implementing the proposed solutions requires cross-sectoral coordination between the government, business, communities, and international partners. Priority areas include infrastructure development, digitalization, SME support, institutional reforms, and strengthening human capital.

This analysis can serve as a guide for developing policy decisions, launching pilot programs, and developing sustainable gastronomic tourism clusters. In a rapidly changing external environment, regular reassessment of scenarios and flexible policy adaptation are essential.

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