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RAINFOREST PROJECT SUMMARY

Food and biomass production systems are among the most prominent drivers of biodiversity loss worldwide. Halting and reversing the loss of biodiversity therefore requires transformative change of food and biomass systems, addressing the nexus of agricultural production, processing and transport, retailing, consumer preferences and diets, as well as investment, climate action and ecosystem conservation and restoration. The RAINFOREST project will contribute to enabling, upscaling and accelerating transformative change to reduce biodiversity impacts of major food and biomass value chains. Together with stakeholders, we will co-develop and evaluate just and viable transformative change pathways and interventions. We will identify stakeholder preferences for a range of policy and technology-based solutions, as well as governance enablers, for more sustainable food and biomass value chains. We will then evaluate these pathways and solutions using a novel combination of integrated assessment modelling, input-output modelling and life cycle assessment, based on case studies in various stages of the nexus, at different spatial scales and organizational levels. This coproduction approach enables the identification and evaluation of just and viable transformative change leverage points, levers and their impacts for conserving biodiversity (SDGs 12, 14-15) that minimize trade-offs with targets related to climate (SDG13) and socioeconomic developments (SDGs 1-3). We will elucidate leverage points, impacts, and obstacles for transformative change and provide concrete and actionable recommendations for transformative change for consumers, producers, investors, and policymakers.

EXECUTIVE SUMMARY

Cyprus's tourism sector - a cornerstone of the economy - exerts significant pressures on food systems and biodiversity, highlighting an urgent need for transitioning governance in the food touristic chain. This policy brief identifies key governance challenges and opportunities in the touristic food chain and recommends national and industry-level policy actions to enable transformative pathways for sustainable food systems in the touristic industry that benefit biodiversity.

The sector's highly seasonal nature and reliance on a "sun and sea" mass tourism model influences food availability and strains local resources necessitating substantial food imports. Fragmented regulations and siloed responsibilities across tourism, agriculture, and environment agencies have resulted in a lack of integrated strategies. For example, the national climate change adaptation and tourism strategies do not yet address the tourism food chain's biodiversity impacts. Additionally, while tourists apprear increasingly aware of sustainable food practices, their participation remains inconsistent. However, on the supply side, there is a growing uptake of sustainability practices across the Cypriot hotel sector, particularly in food provision and food-waste reduction which is mainly driven by the prerequisite of tour operators for sustainability certificates. Opportunities lie in the strong alignment between Cyprus's national tourism-related policies and the EU Transition Pathway for Tourism.

The actions proposed in this policy brief are ultimately meant to guide the governance conditions that unlock the transformative pathways set out in RAINFOREST's WP1, while drawing on - and adding value to - the insights from the Cyprus touristic-food-chain case study developed under WP3.

1. BACKGROUND AND CONTEXT

The island of Cyprus, located in the north-eastern Mediterranean basin with a population of just under 1 million inhabitants, hosts around 4 million tourists annually under a predominantly "sun and sea" mass mass tourism model. While tourism is vital to the economy and employment (contributing ~12–13% of GDP) according to the World Travel and Tourism Council (Nejc et al., 2023), the mass tourism product of the island is exerting great pressures on the limited natural and human resources, and erodes the socio-cultural fabric.

The Cypriot authorities have acknowledged these challenges, particularly the high vulnerability of the island's tourism sector to climate change. The most recent tourism-related policies aimed at ensuring a sustainable future for the sector are outlined in the updated National Climate Change Adaptation Strategy (NAS) (Ministry of Agriculture Rural Development and Environment, 2025) and the National Tourism Strategy (NTS) 2030, in line with the general guidelines set in the *Transition Pathway for Tourism* (European Commission, 2022) at the EU level. The updated NAS (2025) explicitly identifies tourism as highly vulnerable to climate impacts like heatwaves, wildfires, and coastal erosion. Adaptation measures for tourism focus on institutional mainstreaming of climate risks, diversifying away from the mass tourism model, and building resilient infrastructure. Similarly, NTS 2030 articulates a vision for sustainable tourism that benefits environment, society, and economy. The NTS's objectives align closely with the European Commission's Transition Pathway for Tourism - both emphasize accelerating the green and digital transitions, strengthening resilience, and fostering stakeholder collaboration.

Despite these positive strategic directions, important policy gaps persist that neither the NAS nor NTS have yet addressed. The NAS, while comprehensive on climate risks, has no specific adaptation actions for securing sustainable food supply chains for tourism or for mitigating tourism's impact on land use and biodiversity. The NTS 2030 likewise does not explicitly address how to integrate local agriculture with tourism demand or reduce the carbon footprint and biodiversity impacts related to imported food, given the island's dependence on food imports. This highlights a

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broader lack of integration between tourism, agriculture, and environmental policies.

The following sections detail the key challenges arising from these issues, the emerging opportunities that Cyprus can leverage, and policy recommendations to foster an innovative and just transition in the touristic food chain. Although the recommendations are focusing primarily on Cyprus, they are potentially relevant to other popular touristic island destinations in the Mediterranean.

1.1 Key challenges and barriers

- **Seasonality and demand volatility:** A comprehensive system mapping of the current situation in the Cyprus tourism has shown that the sector is highly seasonal, with tourist arrivals - and food consumption peaking - in summer (D3.6, Figure 4). This seasonality affects food availability and leads to volatile demand swings that challenge local agriculture and distribution. Overall, tourism has a modest but significant impact on the island's total food supply (4–8% for major food categories), particularly for beverages and animal-based products, amplifying stress on food supply chains in a short peak season.
- **Import dependence:** While much of the meat and dairy served to tourists is produced domestically, it relies heavily on imported animal feed, increasing the island's dependence on external resources. Embedded impacts of imported foods (e.g. the land and water used to produce meat or feed abroad) translate into pressures on ecosystems outside Cyprus—that is, the sector's footprint is externalised (with associated biodiversity and resource implications abroad). These are attributional findings linked to meals served in Cyprus (see D3.6) and do not assess additionality, i.e., whether tourists consume an additional quantity of meat and dairy relative to their home-diet baseline; evaluating additionality would require a counterfactual comparison with tourists' home diets which is outside this project's scope.
- **Fragmented governance and regulatory silos:** The governance of Cyprus's touristic food chain involves several domains - including tourism promotion, food safety, agriculture, waste management, trade, and environmental protection - with responsibilities shared across various ministries and

regulatory bodies. This often results in fragmented regulations and a lack of an integrated vision. For instance, there is currently no single framework or body ensuring that tourism strategy is linked with sustainable food sourcing or that climate adaptation plans include food system resilience for tourism. In particular, although the NAS (2025) and NTS (2030) were developed in parallel, they did not cross-reference actionable synergies in food availability and (sustainability) sourcing.

- **Tourist preferences and behavioral habits:** Consumer behavior plays a pivotal role in the touristic food chain. The survey results from Cyprus's tourists (see RAINFOREST's D3.6) suggest that while tourists are generally receptive to sustainable practices within the food value chain, their involvement remains inconsistent. When at home, tourists more commonly report reducing packaging waste and reusing cooking ingredients, while activities like composting, discussions on environmental issues, and activism aimed at addressing environmental problems show lower levels of engagement. The purchase of organic foods and efforts to avoid environmentally harmful products remain limited, possibly due to factors such as cost and convenience.

1.2 Opportunities and enablers

- **Growing sustainability awareness and hotel industry engagement:** Both tourists and industry stakeholders are increasingly aware of sustainability issues within the food value chain. On the *demand side*, the tourist survey results (see D3.6) revealed a varied but generally positive attitude among tourists towards sustainable food practices. Key findings include tourists' strong interest in knowing the origin of the food consumed during their stay in Cyprus, the majority not finding local food products more expensive than imported ones and those who perceive local food as more expensive are willing to pay a little more for it. Similarly, many tourists find eco-labeled food products more expensive but are still willing to incur a modest premium for these products. Interestingly, a significant portion of tourists are open to meat-free days at hotel buffets and report having little to no leftover food

during meals, with some either discarding or sharing their leftovers. On the *supply side*, the hotel survey results has revealed that the hospitality industry in Cyprus, particularly high-end hotels and resorts, is increasingly engaging with resource efficiency practices. Due to the increasing demand for sustainable tourism, tour operators are placing greater pressure on hotels to obtain sustainability certifications (e.g., such TravelLife, EMAS, Green Key) and hence promote the adoption of circular economy practices particularly those aimed at reducing food waste.

- **Technological innovations**: On the technology front, digital tools can connect and streamline the tourism food chain. Tourists surveyed (see D3.6) generally find interactive technologies like QR codes, NFC, RFID, and Blockchain useful and time-saving for getting information about food origin and sustainability.
- **Policy alignment at EU and national levels:** The strong alignment between Cyprus's strategic goals reflected in the above-mentioned national level policies (NAS and NTS) and the EU Transition Pathway for Tourism provides a supportive policy environment. At the EU level, institutions are prioritising funding and frameworks to support the green and digital transitions in tourism. The European Green Deal (European Commission, 2019), and Farm-to-Fork Strategy (European Commission, 2020), while not tourism-specific, encourage sustainable food production and consumption. Cyprus can position its tourism sector as a living lab for green and digital initiatives, with the recognition of tourism in high-level strategies offering an opportunity to integrate innovative ideas, such as zero-emission, zero-waste or biodiversity-friendly hotel standards, into mainstream policy.

2. POLICY RECOMMENDATIONS

Below, we present policy recommendations at both the national and industry levels, designed to address the challenges identified and leverage the opportunities based on the mapping of the current state of Cyprus's tourism, as well as the results gathered from the hotel and tourist questionnaires and quantification tools (LCA, WIO, FABIO) detailed in D3.6.

2.1 National-level (Cyprus) policies and links to EU initiatives

- **Integrate food system sustainability into tourism strategy:** The updated National Tourism Strategy should explicitly incorporate targets and measures for a sustainable tourism food chain. This could take the form of a dedicated *"Sustainable Food in Tourism" action plan*, developed jointly by the Deputy Ministry of Tourism,the Ministry of Agriculture, Rural Development and Environment, and the Ministry of Commerce.

  Key elements might include:

  1) a target to increase the share of locally sourced food in hotel establishments by a certain year;
  2) support for agritourism and gastronomy initiatives;
  3) campaigns to promote Cypriot cuisine as both authentic and sustainable; and,
  4) guidelines on healthy, low-impact (plant-based) menus for hotels.

  Once formalizing these in strategy, Cyprus will fill the current policy gap and send a clear signal to industry actors. These efforts align with and complement the existing focus on climate-friendly and resilient tourism in the NAS. This would also align with the spirit of the development or update of comprehensive tourism strategies (Topic 4) which falls within the *regulation and public governance* action area of the EU Transition Pathway for Tourism.

- **Community engagement, collaborative governance and sharing best practices:** Local communities should be engaged in the transformation process of the touristic food chain. Destination Management Organizations (DMOs) can include representatives of farmers' associations, fishers, community leaders, and NGOs alongside the hotel industry and restaurants. This multi-stakeholder local governance model can co-create solutions to ensure the joint implementation of the national tourism strategy. For example, when tourism and food industry actors collaborate, they can share best practices, pool resources, and conduct joint procurement of sustainable products. This approach is based on a collaborative and inclusive governance

approach at the EU level, where DMOs take on strategic roles and the local community and authorities are actively involved in the decision-making process for the local tourism strategy and work plan (Topic 5 of the EU Transition Pathway for Tourism).

2.2 Industry-level measures

- **Adopt sustainable menu planning and procurement**: Tourism enterprises, particularly hotels and resort chains, should develop and implement sustainable menu planning and sustainable procurement practices. Key elements might include:

    1) transitioning toward more plant-based menu designs can contribute to the reduction of the hotel's biodiversity impact. Redesigning the buffet to make sustainable dishes more presentable, attractive and clearly labeled with terms like "plant-based", "chef's vegetarian pick", or "climate-smart choice" can encourage guests to reduce meat consumption. Additionally, the use of Class II (cosmetically imperfect) produce in the buffet offerings, once quality specifications and standards are met, can be another cost-effective and resource-efficient approach that contributes to zero food waste;
    2) limiting the consumption of red meat and especially beef. To reduce the presence of beef dishes, hotels could consider offering beef dishes as part of themed specials, smaller cuts, or introducing live cooking of beef cuts. Furthermore, red meat in mixed dishes (e.g., stir fries tacos) can be substituted with better environmentally performing protein, such as poultry, legumes, or mushrooms;
    3) adjusting the presentation of a buffet can influence guest selections and preferences. Strategically placing plant-based foods at the beginning of the buffet line can lead guests to fill their plates with more sustainable options before reaching meat-based foods. This approach presents a dual benefit of strategically reducing food waste and meat-based consumption without compromising guests' satisfaction;

4) menu planning should emphasize seasonal availability – offering dishes that celebrate what's fresh in Cyprus at the time rather than importing out-of-season equivalents, e.g. offering fresh, locally grown fruits such watermelon, peaches, and figs available in the summer, instead of relying on imported tropical fruits such as pineapples or mangoes;
5) reengineering the buffet design to use smaller trays that are replenished more frequently can reduce the uneaten food and therefore food waste;
6) proactively sourcing from Cypriot producers when possible, and choosing suppliers who adhere to sustainability standards for imported items.

- **Enhance transparency, guest education and engagement**: Hotels should leverage tourists' interest in knowing the origins of their food by actively sharing the story behind it, enabling informed choices and—where appropriate—using light-touch choice architecture (e.g., placement, defaults, salience) to highlight verified lower-impact options rather than relying on promotional messaging. Examples of such options include labelling buffet dishes with their farm or region of origin, having "meet the farmer" events, or using QR codes on menus for guests to learn about dish sourcing. These options should not be a blanket 'buy local' claim—local options should be highlighted when supported by credible sustainability evidence; where local items have higher impacts (e.g., beef), they should be presented transparently without promotional framing, and offer appealing lower-impact alternatives (e.g., seasonal plant-based dishes or poultry). Engaging guests in sustainability can also include gentle nudges to reduce waste (e.g., signage at buffets encouraging reasonable portions and the option to take leftovers (where safe) or to request smaller portions initially and refill as needed). These are choice-architecture measures (not marketing), aimed at preserving freedom of choice while making the sustainable option easier. Monitoring plate waste and providing feedback to guests (e.g., informational posters like "Yesterday we reduced food waste by X% – thank you!") can engage them in the effort. Additionally, gamifying the experience through challenges like "zero-waste meals" or rewarding guests who try all-local dishes that meet

credible sustainability criteria (or other verified lower-impact options) can help shift social norms around food consumption during their holiday.

In sum, the recommended industry-level measures targeting the *supply side* of the touristic food chain aligns with the **International Market Innovation** pathway within the VITAL-PATHS-FOOD pathways (see D1.2). The principles of this pathway imply interventions which could potentially reduce import reliance and enhance the sustainability of local supply chains. Measures targeting the *demand side* of the touristic food chain, match the **Local Commons Stewardship** pathway which requires initiatives to promote sustainable food consumption. In the touristic food industry in Cyprus, voluntary measures at the local business level - such as awareness campaigns and guest engagement - are needed to help shift tourists' diets to more sustainable food options. This is particularly important given the personal and individualistic nature of food choices.

3. CONCLUSION

The journey to transform food chains is challenging, but it is important to acknowledge the co-production of nature's contributions to people perspective (NCP) (Díaz et al., 2015), as it emphasises the active role of human practices, knowledge, collective action and cultural values in shaping ecosystem structures, processes, and services.Transitioning the governance of Cyprus's touristic food chain is, therefore, both a necessity and an opportunity. The challenges of seasonality, import dependence, fragmented regulation, and unsustainable consumption patterns are significant, but they can be counterbalanced by growing tourist awareness, stakeholder willingness to change, technological innovations and policy momentum. The policy recommendations outlined in this brief can gradually reshape the governance of the tourism food supply chain in Cyprus — and in similar destinations — towards a sustainable model that reduces or, where possible, halts biodiversity loss. National policies should establish clear frameworks and incentives, while local authorities and supply-chain stakeholders will need to adapt and implement solutions at the operational level, moving the sector towards transformative sustainable pathways.

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