

# Analysing and Designing Circular Value Networks for Sustainable Tourism – a Case Study

Sandra Grèzes-Bürcher

*Institute of Tourism, HES-SO Valais/Wallis*

*University of Applied Sciences and Arts Western Switzerland, Switzerland*

Vincent Grèzes

*Entrepreneurship & Management Institute, HES-SO Valais/Wallis*

*University of Applied Sciences and Arts Western Switzerland, Switzerland*

## Abstract

This exploratory study addresses the lack of literature on circular value networks in sustainable tourism ecosystems. The authors argue that circular, cross-industrial value networks can optimize the use of both tangible and intangible resources within a tourism region, fostering sustainable development. This is particularly relevant given tourism's significant CO<sub>2</sub> emissions and its role in addressing SDGs such as goals 3 (good health and well-being), 8 (sustainable economic growth), and 12 (sustainable consumption and production). The central research questions are: "How can unused regional resources in a tourism context be valorised?" and "How does integrating circular value networks in a tourism destination contribute to sustainable development?" Using systemic design methodology (Battistoni et al., 2019), the researchers identify unused resources and existing and potential cross-industrial circular value networks in the Regional Nature Park Pfyn-Finges in the canton of Valais, Switzerland. They analyse selected value networks, examining their potential, challenges, and impact on all three dimensions of sustainability, and design ideal value networks based on these findings. The study highlights the significant potential of unused resources to enhance circular multi-actor value networks within a tourism destination, contributing to all aspects of sustainability and boosting the destination's resilience.

**Keywords:** Circular economy, value networks, systemic design, sustainable tourism, regional nature park

**JEL classification:** R11 Regional Economic Activity: Growth, Development, Environmental Issues, and Changes

**Paper type:** Research article

**Received:** 10 March 2024

**Accepted:** 1 September 2024

**DOI:** 10.54820/entrenova-2024-0020

## Introduction

The tourism industry is facing numerous challenges including climate change, environmental degradation, global competition, evolving tourist needs, and global health crises like COVID-19, which have exposed its vulnerabilities. Tourism's environmental impact is paradoxical: it significantly harms the environment through high energy and water use, food waste, CO<sub>2</sub> emissions, and traffic, yet the appeal of tourism relies heavily on the beauty of landscapes and pristine nature. Despite global efforts towards making tourism sustainable and resilient, progress remains insufficient, necessitating new strategies to address these multifaceted issues (Niewiadomski & Brouder, 2024).

The concept of Circular Economy (CE) is often seen as a promising approach to operationalize the principles of sustainable development (Kirchherr et al., 2017). A CE presents an alternative to the linear 'take-make-use-dispose' model by highlighting the need for continuous circular material and energy flows, thus minimizing waste (Borrello et al., 2017). Strategies that characterize a circular economy include optimizing material usage, extending the lifespan of products and their components, and enhancing the efficiency of product use and manufacturing (Kirchherr et al., 2017).

To date, CE research has primarily focused on the manufacturing sector, with particular emphasis on engineering and scientific technologies (Rodriguez et al., 2020). In contrast, research on service-oriented industries, such as tourism, remains limited (Einarsson & Sorin, 2020). Moreover, most existing research linking CE and tourism has concentrated on micro-level applications, particularly from environmental and business management perspectives, notably within hotels and restaurants (Renfors, 2022). Einarsson & Sorin (2020) emphasize that collaboration and joint value creation among stakeholders within value networks are crucial for the success of circular and sustainability initiatives. Therefore, more research involving network-level investigations, and a multi-stakeholder perspective is needed (Renfors, 2022).

This paper aims to fill this gap by identifying unused resources and exploring both existing and potential cross-industrial circular value networks in the Regional Nature Park Pfynges, located in the Canton of Valais, Switzerland. The key research questions are "How can unused regional resources in a tourism context be valorised?" and "How does integrating circular value networks in a tourism destination contribute to sustainable development?".

This exploratory study adopts a systemic approach (Battistoni et al., 2019), conducting a holistic analysis of the case study region by examining its potentialities and criticalities, unused resources, and cross-industrial value networks. The study then delves into selected value networks, evaluating their potential, challenges, and impact across all three dimensions of sustainability. Additionally, it proposes enhancements to existing value networks to optimize their overall impact. The authors argue that better management of both tangible and intangible local resources through circular approaches and cross-industrial value networks can significantly boost the sustainable development and resilience of tourism destinations.

## Current state of knowledge

### *Circular Economy*

The concept of a CE provides an alternative to the current linear and unsustainable economic model, which follows a "take, make, use, dispose" approach (Ghisellini et al., 2016; Korhonen et al., 2018). Instead, CE advocates for a circular and regenerative system that minimizes resource input, waste, emissions, and energy leakage

(Geissdoerfer et al., 2017). As a regenerative system, CE not only restores natural resources but also enhances human and social capital by creating meaningful employment opportunities and promoting a more equitable distribution of resources and financial capital. The CE concept draws inspiration from natural ecosystems through biomimicry, aiming to maintain continuous material and energy flows with minimal waste (Borello et al., 2017).

Core strategies for promoting circularity include approaches that directly address material and product resources, as well as those that engage value networks of various stakeholders. Strategies focused on products follow the R framework, which ranges from the basic 3 Rs (reduce, reuse, recycle) to the comprehensive 9 Rs (recover, recycle, repurpose, remanufacture, refurbish, repair, reuse, reduce, rethink, and refuse). These strategies aim to extend the lifecycle and efficiency of products (Geissdoerfer et al., 2017; Kirchherr et al., 2017). In terms of network creation, circular economy (CE) literature has predominantly focused on industrial symbiosis networks, which are considered a promising application for achieving resource efficiency. Industrial symbiosis involves various industries collaborating to gain a competitive advantage by exchanging materials, energy, water, and by-products. The core elements of industrial symbiosis include cooperation and the synergistic opportunities arising from geographic proximity (Chertow, 2000). Although the term suggests a primary focus on industrial production and practices, its scope extends beyond this area. Industrial symbiosis networks can broaden their exchanges to include sectors such as agriculture, horticulture, forestry, fisheries, municipal and urban (Martin & Harris, 2018), and tourism systems.

For CE initiatives to succeed, both tangible and intangible resources, as well as geographical and organised proximities, play a crucial role. Local tangible resources encompass natural resources, infrastructure, equipment, and both organic and inorganic waste that can be recycled or repurposed. Local intangible resources include know-how, skills, cultural heritage, and community networks, which play a vital role in shaping and implementing CE initiatives, reflecting the area's identity and values. Geographical proximity streamlines material transport, promotes resource sharing, and enables projects to align with the unique attributes of the area. Moreover, it facilitates coordination and communication among local stakeholders. Organised proximity, characterized by the relational dynamics among local stakeholders and strengthened by a shared sense of belonging and common values, fosters a strong commitment to CE initiatives (Chembessi et al., 2024).

Chembessi et al. (2024) categorize local resources into anchored and transferable types. Anchored resources are specific to a region, such as local climate, biodiversity, and traditional practices. Transferable resources, like energy, water, and certain knowledge, can be relocated and applied universally. This distinction underscores that while some CE solutions are globally applicable, others are tailored to local conditions (Chembessi et al., 2024).

### *Circular economy and sustainability*

A CE closely aligns with the goals of sustainable tourism development (Ghisellini et al., 2016; Kirchherr et al., 2017). In addition to its environmental objective of minimizing material and energy inputs within production-consumption systems and reducing waste emissions, a CE also significantly contributes to sustainable development on economic and social levels. Economically, implementing a CE seeks to lower costs associated with raw materials, energy, waste management, emissions control, and the risks related to environmental regulations and taxation. It also aims to spur innovation in product design and create new market opportunities for businesses. On

a societal scale, the fundamentals of a sharing economy take precedence, emphasizing the significance of a community of users collectively sharing value, services, or functions efficiently, prioritizing this over individual consumption (Korhonen et al., 2018).

Nevertheless, an analysis by Kirchherr et al. (2017) indicates that most authors and practitioners predominantly emphasize the economic benefits of the CE model, with environmental concerns following closely behind. In contrast, Geissdoerfer et al. (2017) discovered that the focus of most scientific papers leans toward environmental issues. However, both studies concur that social issues receive comparatively less attention (Geissdoerfer et al., 2017; Kirchherr et al., 2017).

When examining the contribution of a CE to sustainability, it becomes imperative to evaluate the holistic sustainability impact of each case, as mere material cycling or sharing of goods does not guarantee sustainability. For example, utilizing forest residues for renewable energy may appear sustainable on the surface, yet it could disrupt forest ecosystems. Furthermore, the production of renewable energy itself demands energy and results in waste generation. Social and economic dimensions are also influenced; for instance, the establishment of a local food network based on CE principles might inadvertently diminish job opportunities and give rise to new challenges. This intricate interconnectedness underscores that advancements in one domain may engender complexities elsewhere (Korhonen et al., 2018).

### *Circular Economy and tourism*

While the CE has traditionally been focusing on product manufacturing and resource-intensive sectors, its application within service-oriented industries like tourism is increasingly recognized as crucial. Einarsson & Sorin (2020) emphasize that the CE concept spans the entire economy, requiring engagement from all stakeholders across diverse industries to achieve the essential circular transformation. This is particularly important, as service-oriented industries like the travel sector, with its extensive value chain and ecosystem, exert considerable demand on resources ranging from materials and energy to land, buildings, vehicles, textiles, and consumables. Moreover, the tourism industry is complex and connected to many other sectors, so solving its problems needs comprehensive solutions (Brown & Wyatt, 2010). The CE, being a systemic approach that operates across micro, meso, and macro levels (Kirchherr et al., 2017), offers effective solutions for the tourism industry's social, economic, and environmental issues (Einarsson & Sorin, 2020).

Circular tourism encompasses actions such as recovery, reuse, revitalization, valorisation, and regeneration of both tangible and intangible resources. Regarding tangible resources, Manniche et al. (2017) argue that it is crucial to recognize the CE as an approach that involves reimagining tourism companies as producers of various by-products and resources that can be repurposed rather than discarded. For intangible resources, Girard and Nocca (2017) emphasize that circular tourism must also protect and integrate cultural and natural heritage. Reusing cultural and natural assets can create jobs, stimulate new businesses, generate tax revenues, preserve wildlife habitats, and enhance recreational opportunities while reviving cultural values. Additionally, tourism can help sustain unique local knowledge, including values, language, and skills. In this way, circular tourism helps preserve collective memory amid rapid change (Girard & Nocca, 2017).

In the tourism context, Janin & Perron (2014) differentiate between generic resources, such as fuel, or undifferentiated food products (such as milk and meat), and those that are specific due to their unique modes of production or their significant interaction with the territory and the historical context of the actors involved. Examples

in tourism include Reblochon cheese in Haute-Savoie or silk production in the Monts du Lyonnais. In tourism, it is essential to adopt an approach centred on territorial resources, contrasting with purely economic perspectives that often separate sectors and industries. This territorial approach breaks down barriers, fosters collaboration, and aims to address both market and non-market goals, including social and territorial development. It also enhances economic growth by differentiating products and increasing territorial appeal. Within a territory, a resource is not just “a product and a use”; it is systemic, encompassing both material and immaterial elements that distinguish the territory. Valorising these unique resources differentiates the territory and fosters “territorial making,” involving diverse users, like residents and second homeowners (Janin & Perron, 2014).

Renfors (2022) reviewed recent developments in CE research in the tourism sector and found that studies have mainly focused on micro-level applications, particularly in environmental and business management areas, such as hotels and restaurants. Emerging topics include circular consumption behaviour, the integration of CE with smart tourism, local supply chain collaboration, and the creation of circular tourism destinations. Renfors (2022) suggests addressing research gaps by adopting a multi-stakeholder approach and expanding research to the destination level, involving a wider range of stakeholders. She recommends that tourism researchers shift their focus to the macro level to better understand CE in tourism, emphasizing the importance of engaging local stakeholders, such as those in natural cosmetics, textiles, or furniture industries, to advance CE initiatives.

To sum up, CE research has primarily focused on material and energy flows, with less emphasis on intangible resources. However, since CE encompasses the entire economy, it is logical to also integrate intangible resources. In the tourism sector, leveraging unique territorial resources is crucial for differentiating offerings. These resources can include both tangible by-products and intangible cultural heritage. The authors argue for considering a wide range of resources, such as waste, human, and financial assets. Additionally, current research on tourism and CE often lacks a multi-stakeholder perspective that views the destination and its intersections with related industries as the primary unit of analysis. Therefore, the authors suggest a systemic approach that considers the tourism industry's intersections with sectors like forestry, agriculture, and construction.

## Case study region

The case study covers the area of the Pfyn-Finges Nature Park in Valais, Switzerland including the principal destinations of Crans-Montana and Leuk Leukerbad region, known for its thermal baths. The Pfyn-Finges Nature Park consists of 12 municipalities with a total area of 279 km<sup>2</sup>, ranging in elevation from 500 to 4,153 meters. The Crans-Montana municipal association comprises three municipalities that are also part of the Pfyn-Finges Nature Park and extend up to the Plaine Morte Glacier at nearly 3,000 meters in elevation.

Although the two locations are geographically close, they exhibit significant topographical and biological differences due to variations in altitude and terrain. From a tourism perspective, the two regions also attract very different target groups. Additionally, the residents speak two different languages: German and French.



## Methodology

The authors draw on systemic design methodology (Bistagnino, 2011). This approach aims to convert theoretical knowledge into practical change strategies tailored to the needs and capacities of specific regions or communities and determine the right level of reproducibility (Barbero & Bicocca, 2015). For this study, the methodology was modified as follows:

1. **Data Collection:** The researchers conducted a holistic diagnosis by collecting qualitative data from multiple sources, including expert interviews, desktop research, analysis of reports and scientific studies of the concerned destinations, direct observations, and informal discussions with key stakeholders. The authors' in-depth knowledge of the region and their extensive experience in tourism research helped them to connect and enrich the collected information (Reason & Bradbury, 2008). Five interviews with destination experts were conducted using the snowball sampling method (Naderifar et al., 2017). This research aimed to identify resources in the tourism industry and related sectors, such as agriculture and forestry, that could be valorised, as well as existing examples and ideas of circular economy value networks. The analysis also focused on assessing the potentialities and criticalities related to these examples and the destinations in general.
2. **Data Analysis and System Design:** The information was organized into a Rich Picture (Checkland & Scholes, 1990), concentrating on the tourism service chain and its connections with other sectors. Existing circular value networks were analysed, and new relationships were developed to optimize resource utilization and create sustainable value for all stakeholders involved.
3. **Model Validation and Solution Prioritization:** The researchers prioritize the solutions according to the following criteria: importance in a tourism context, and potential value creation on all three dimensions of sustainability. They presented the model to stakeholders of the nature park team for validation.
4. **Hypothesis Formulation:** Hypotheses are formulated to be tested in future research. The steps for analysing potential results, implementing actions, and evaluating outcomes and feedback within the systemic design methodology (Battistoni et al., 2019) are not covered in this study and should be addressed in future research.

The analytical framework outlined below (figure 1) aids researchers in identifying relevant unused resources, including e.g. organic and non-organic waste. While food waste represents organic waste, textile waste exemplifies non-organic waste. The framework also distinguishes between resources on the supply side and the demand side. Supply-side resources encompass material assets and infrastructure, such as hotels, as well as intangible resources like knowledge and natural resources, including water and animals. On the demand side, resources include intangible assets such as knowledge and financial resources. The authors argue that both tangible and intangible resources are equally important, and their utilization can be optimized from a CE perspective.

Figure 1  
Analytical Framework



Source: Authors' illustration

## Results

### Identified resources

Numerous resources have been identified in the case study region across various categories of the analytical framework, as shown in Figure 2. Given the wide range of options, it is essential to prioritize resources based on their alignment with the region's unique tourism assets and their potential to maximize economic, environmental, and social value. This prioritization should consider the region's strengths and challenges and aim to create innovative offerings that address tourists' needs, engage stakeholders, and form distinctive value networks, ultimately benefiting all parties and supporting regional development.



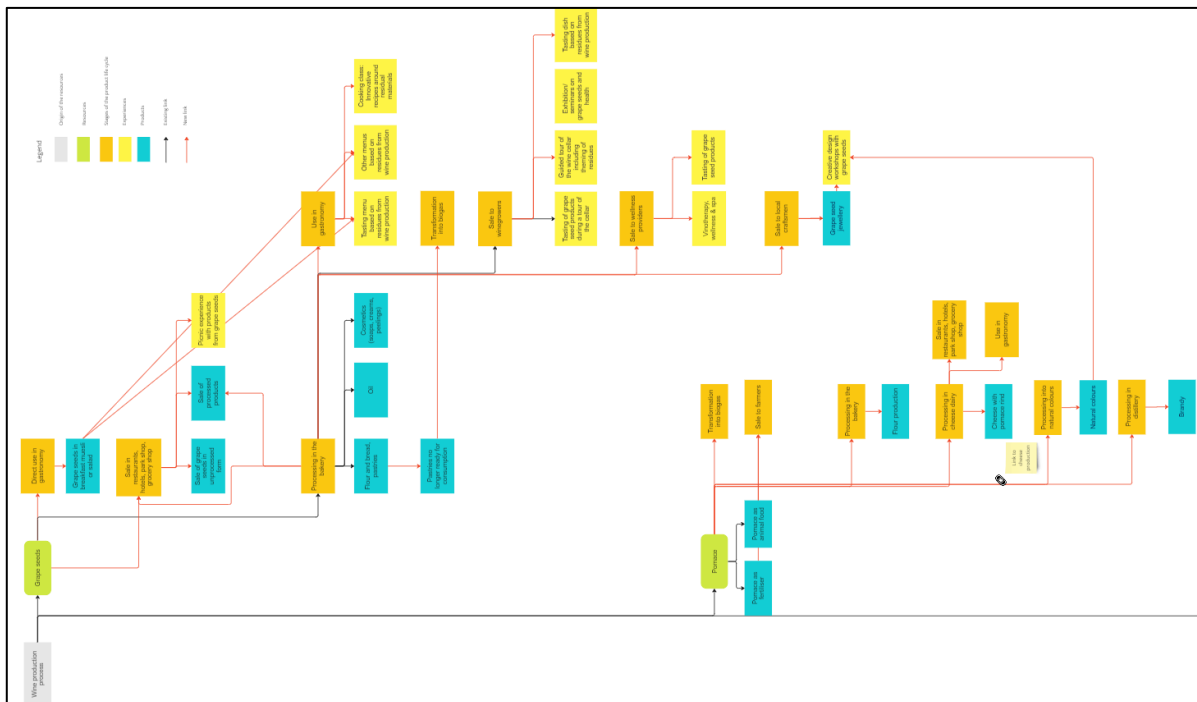


primarily operate independently. Environmentally, this project contributes to reducing food waste by utilizing grape seeds that would otherwise be discarded and minimizes transport distances for resources. From a health perspective, grape seeds offer numerous benefits due to their high-quality active ingredients, including essential antioxidants. Their elevated levels of vitamins A, C, and E, along with lecithin, provide significant cell-protective effect (Source: Interviews).

Since the couple managing the bakery is highly motivated, engaged, and innovative, the network is quite robust. However, they are approaching their limits and would appreciate assistance in further developing the wellness offerings. They would also benefit from professional promotional materials and support in protecting their ideas. Additionally, they plan to expand their production facility and create a showroom to raise awareness among tourists about the environmental and health benefits of grape seeds. The showroom will also display the diverse range of products derived from grape seeds.

Vineyards are an emblematic feature of the park's landscape, with wine being the most well-known local product. Similarly, there are opportunities to explore innovative approaches with other by-products, such as whey from cheese production and spent grains from beer production.

Figure 3  
Value network based on grape seeds

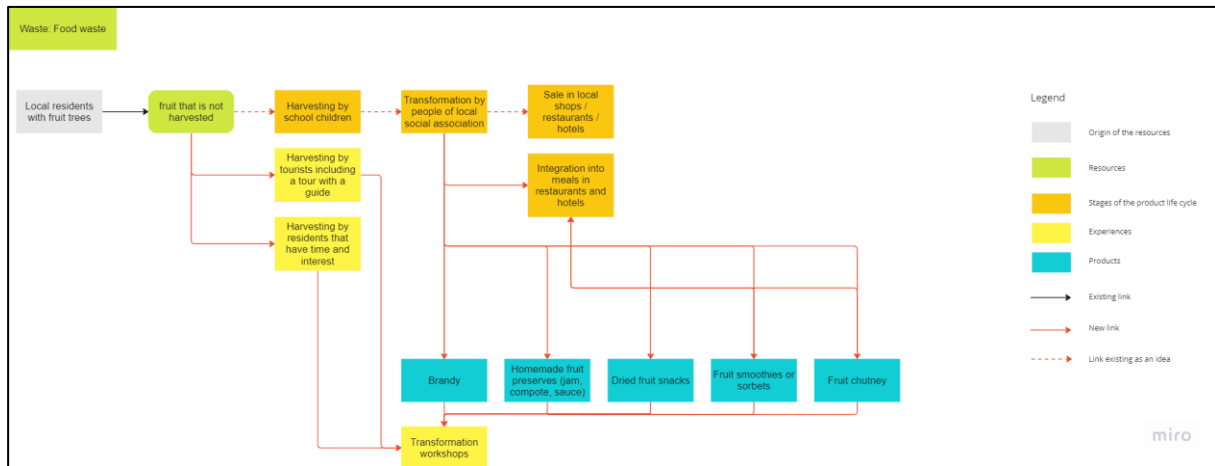


Source: Authors' illustration

An example of food waste to be valorised is unharvested fruit from residents (see figure 4). The idea is to collect this unharvested fruit, such as plums or cherries, and collaborate with a local social association engaging people with disabilities to produce homemade fruit preserves, such as jam or compote, dried fruit snacks, fruit smoothies, chutneys or sorbets. A collaboration would also be possible with a distillery to produce brandy. The different products could then be sold in the park shops or grocery shops of the region and integrated into meals in hotels and restaurants. Potential resources for fruit collection include local students, schoolchildren, residents

with available leisure time or tourists, who at the same time are sensitized towards the problematic of food waste. In addition to marketable products like brandy and homemade fruit preserves, tourists can also enjoy immersive experiences. These include activities such as guided harvest tours and hands-on workshops where visitors can transform freshly harvested fruit into various products.

Figure 4  
Value network based on unharvested fruit of residents



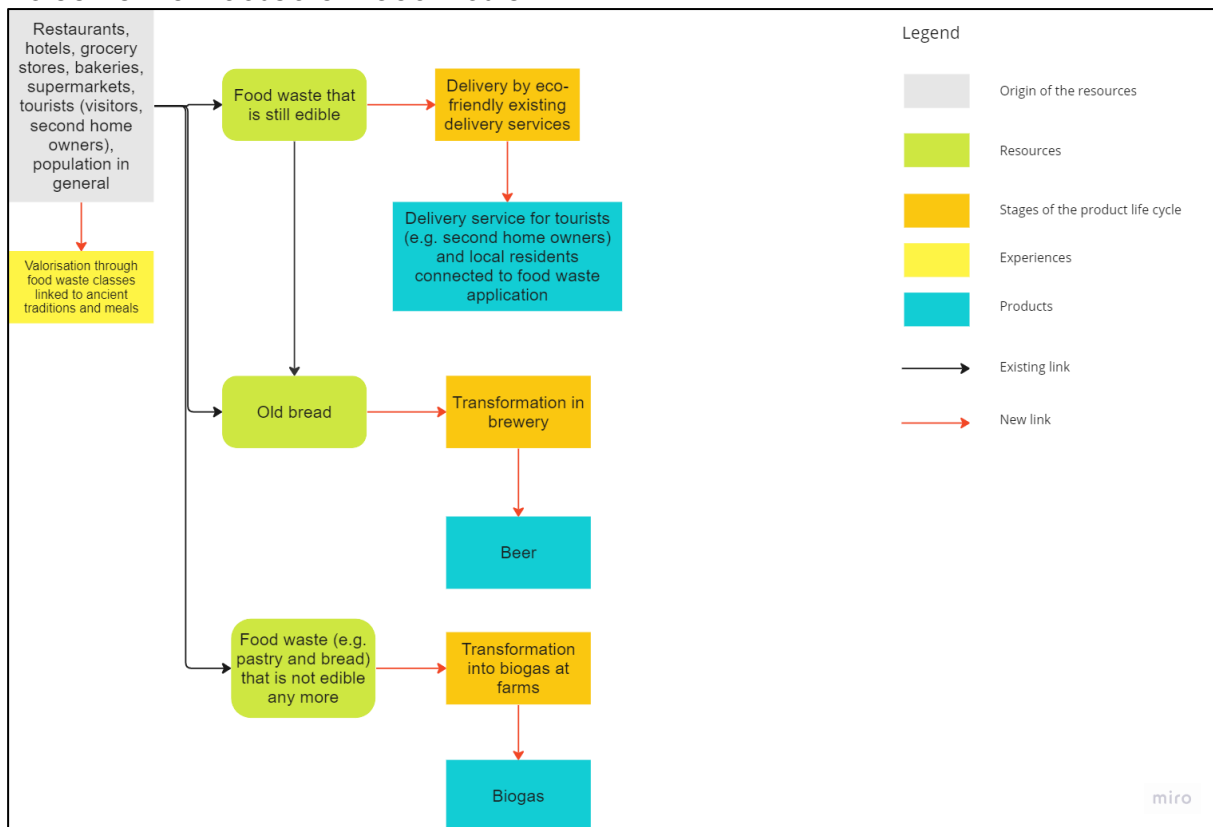
Source: Authors' illustration

On an economic scale, local social associations, shops, restaurants, and hotels stand to benefit from the sale of various products. Environmentally, food waste is minimized and repurposed rather than discarded. Tourists are immersed in local life, gaining insights into circular economy practices. The inclusion of local social associations, such as those employing people with disabilities, enhances the social impact. Overall, this initiative not only supports the local economy but also fosters environmental sustainability and strengthens the social fabric of the community and tourists.

The nature park management has already conceptualized the project. However, the main challenge is currently finding a project coordinator. Interested members of the local community, such as retired individuals or even second homeowners could potentially assist in this role. Establishing a community-building platform would be beneficial in bringing these individuals together. Another challenge is that some residents may feel uncomfortable with strangers entering their gardens to pick fruit.

Another example includes edible food waste from restaurants, hotels, grocery stores, bakeries, as well as contributions from tourists and the local population, that could be delivered to residents and visitors through a local, eco-friendly delivery service. This could be integrated into an existing app that helps redistribute edible food waste, addressing the missing link of transport. In the case study region, an eco-friendly bicycle delivery service already operates and could be integrated into this new circular offering. Additionally, food waste workshops could be organized to teach tourists how to repurpose food waste, connecting it to traditional recipes and practices. Moreover, old bread, particularly bread made with grape seeds, could be used as an ingredient in beer production, thereby closing the sustainability loop. Non-edible food waste could be converted into biogas at local farms, which could then be used to fuel rental cars or for transporting edible food waste.

Figure 5  
Value network based on food waste



Source: Authors' illustration

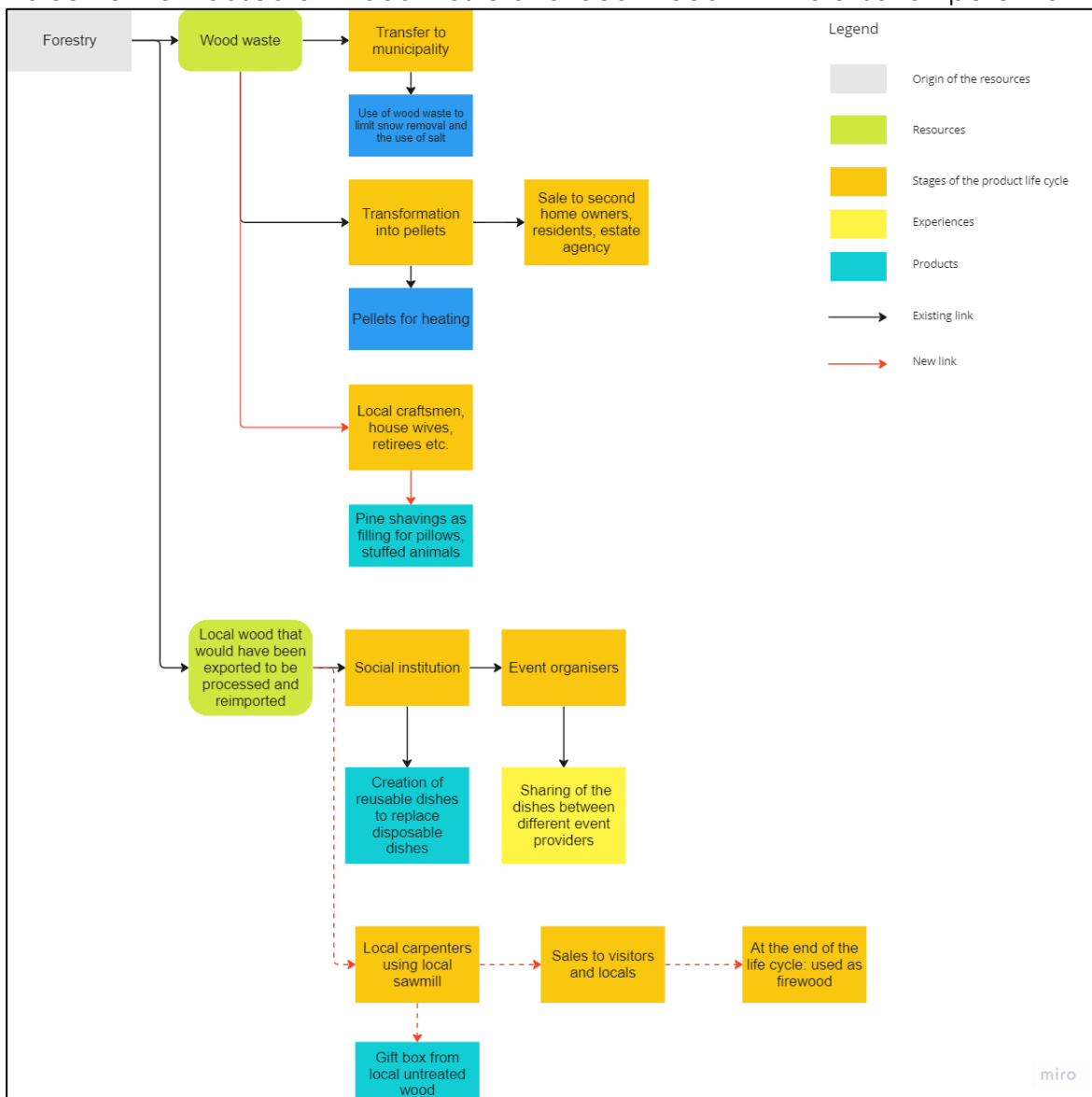
On the one hand, the quantity of food waste can be reduced, providing an environmental benefit. On the other hand, shops and bakeries can generate additional income by distributing surplus food through an app, offering an economic benefit. Challenges include legal issues related to the sale of leftover food, particularly in supermarkets, and the resale of food waste that has been donated to local charities and people in need. For tourists and residents, this system is appealing as it allows them to purchase products at a lower cost. However, they often do not know in advance which products will be available at the end of the day, which could lead to coordination and preference issues.

Incorporating old bread, such as bread made with grape seed flour, into beer production can close the loop and create synergies between different value chains, like grape seed utilization and beer production. Additionally, non-edible food waste converted into biogas at local farms can be used to fuel cars rented to tourists, further promoting sustainability. This biogas can also be utilized to transport edible food waste over longer distances. However, this remains a hypothesis and presents challenges, such as the availability of biogas-powered vehicles. It is essential to assess the impacts at various scales of sustainability to better understand its feasibility.

In the category of other organic waste, there is an interesting intersection with the forestry industry. Currently, wood waste is repurposed to limit snow removal and reduce the use of salt, or it is processed into heating pellets. Additionally, there is potential to transform this wood into pine shavings for use as filling in pillows or stuffed animals, crafted by local artisans, homemakers, or retirees—an opportunity that has yet to be fully explored.

One significant challenge in the canton of Valais is that local wood is often exported for processing and then reimported, resulting in a considerable loss of local value creation. In a tourism context, this wood could be used to produce wooden utensils, which could be shared among event organizers—a practice already in place. A portion of this production could even be customized and sold as souvenirs to tourists. The transportation of the dishes should ideally be eco-friendly. Another particularly interesting idea is the creation of a circular product: local carpenters could produce gift boxes made from local wood. These boxes, which could be filled with local products, could be sold to both visitors and residents. At the end of their lifecycle, the boxes could be repurposed as firewood. The primary challenge preventing park personnel from implementing this idea is the cost (Source: Interviews).

Figure 6  
Value network based on wood waste and local wood with valorisation potential



Source: Authors' illustration

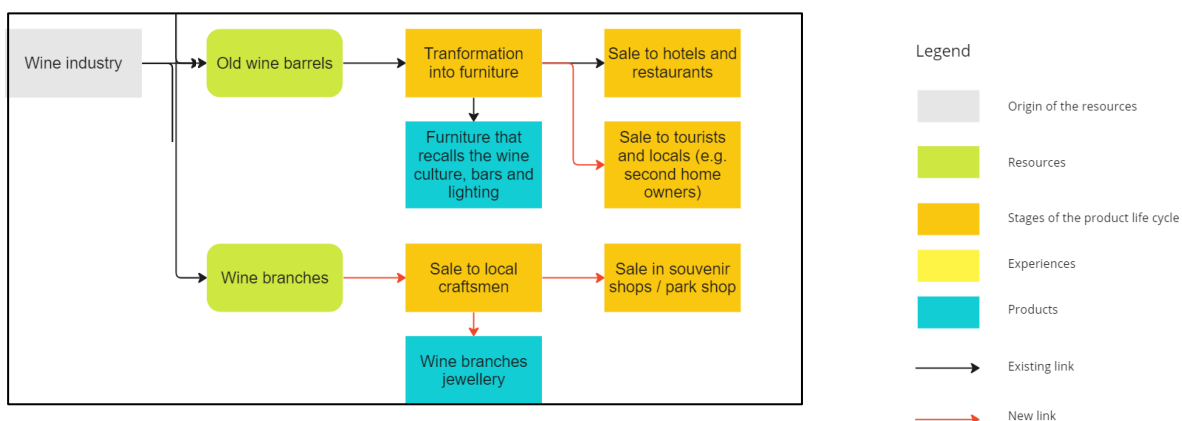
Regarding the benefits across the three pillars of sustainability, utilizing wood waste offers significant advantages. Economically, it reduces snow removal and treatment costs for communities, while the forestry industry profits from selling wood pellets for

heating. Environmentally, this practice helps minimize waste. Using local wood that would otherwise be exported for processing keeps the added value within the region. Involving a social institution in the creation of reusable dishes fosters social inclusion. The promotion of reuse is further encouraged by sharing these dishes, and by customizing and selling some of them, a unique product is created for tourists. On a social level, sharing dishes has the potential to strengthen social capital and foster collaboration among different event organizers. The gift box initiative supports local craftsmen, generating economic value. It also serves as an environmentally friendly alternative to disposable or imported packaging materials, with the added benefit of being repurposed as firewood at the end of its lifecycle.

In the category of other organic waste, the wine industry offers several valuable resources, such as old wine barrels, or grapevines. There is already a business that repurposes old wine barrels into furniture for hotels and restaurants, and this could also be extended to second homeowners and other tourists. This furniture design reflects the wine culture that is central to the region.

Local craftsmen can also create jewellery from grapevines, with some artisans already practicing this using grapevine from various regions. Typically, grapevine branches are pulled out and burned when they are no longer productive. This jewellery often comes with a story about the age and type of grapevine, enhancing its appeal to tourists.

Figure 7  
Value network based on organic waste of the wine industry



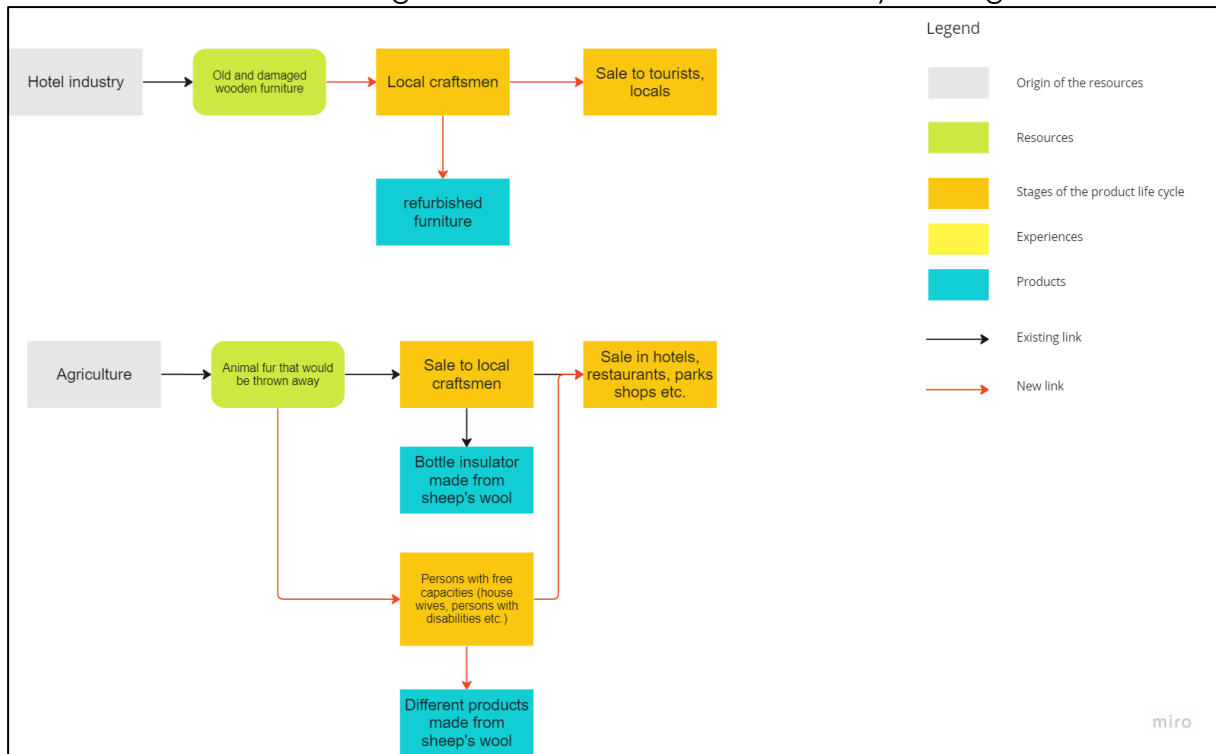
Source: Authors' illustration

Similarly, old and damaged wooden furniture from luxury hotels could be restored by local craftsmen and then resold to tourists and locals. This furniture can carry a compelling story that enhances its marketability.

Moreover, significant quantities of sheep wool are often discarded, making its valorisation desirable. Currently, local craftsmen produce bottle insulators from this wool, which are sold at vineyards and could also be marketed in restaurants, hotels, and shops to tourists. Additionally, the local fashion school and its apprentices create different products from sheep wool. There is potential to enhance the distribution network and involve others with available capacities, such as homemakers, individuals with disabilities, and local social organizations, to further upcycle sheep wool.



Figure 8  
Value network based on organic waste from the hotel industry and agriculture

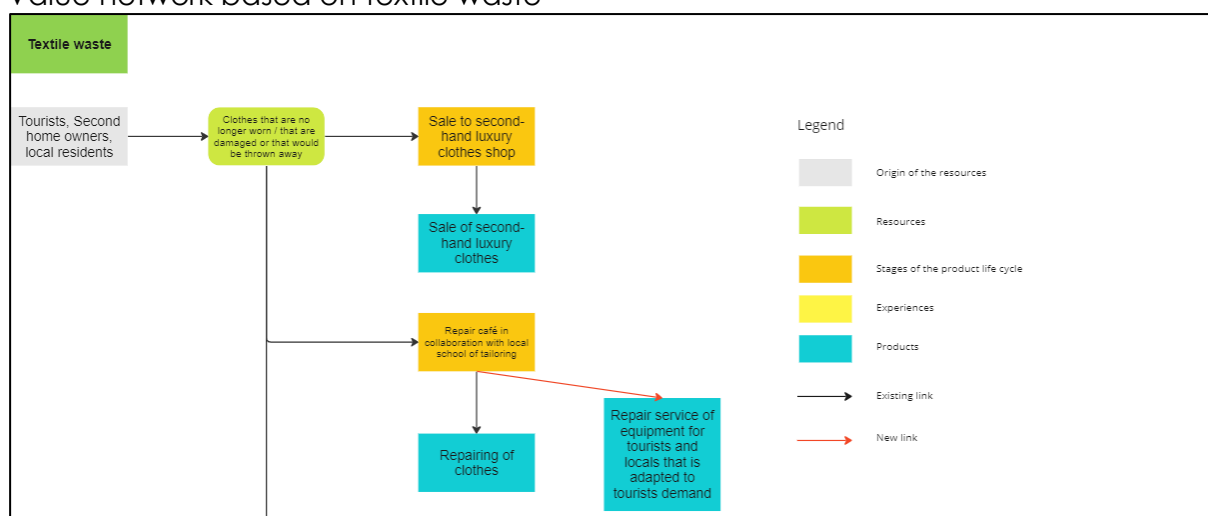


Source: Authors' illustration

These upcycling activities can create local economic value by repurposing resources that would otherwise be discarded. Integrating local social associations can create significant social value.

In the category of non-organic waste, textile waste including textiles that are no longer worn or damaged could be an interesting resource to valorise. A shop selling luxury second-hand fashion has already been opened. The already existing repair café also repairing cloths could extend its offer to specific demand of local tourists including repair of equipment, such as hiking shoes, skis etc. A collaboration with the local school of tailoring is already in place and could be expanded further.

Figure 6  
Value network based on textile waste



Source: Authors' illustration

### Resources of supply side

The valorisation of resources on the supply side is often closely tied to the challenges faced by tourism destinations, challenges that are shared by many others.

One of those challenges is the shortage of housing for seasonal workers. An idea to address this is for students from the University of Applied Sciences in Sierre, a small city in the case study region, to share their apartments with seasonal workers during holiday breaks. This approach allows potentially underutilized infrastructure to be effectively repurposed. This arrangement could allow students to save on rent while providing seasonal workers with convenient housing. However, this concept only exists as an idea, and its implementation would face several challenges, such as gaining the interest and approval of flat owners.

Another challenge is the limited employment of seasonal workers. Regarding immaterial resources, such as work force, knowledge, or skills on the supply side, employee sharing presents an interesting approach to addressing challenges like the limited employment of seasonal workers. For instance, seasonal workers employed in tourism during the winter could transition to roles in companies that need workers during the summer. A current example is ski instructors who work for the nature park administration in the summer, or who take on roles as foresters during that season. Such practices are increasingly common in various destinations. These approaches offer multiple benefits, including reduced recruitment efforts for companies, year-round employment for workers, and corresponding economic and social advantages for them.

To tackle the shortage of skilled professionals, tourism service providers could recruit students from the regional University of Applied Sciences who are enrolled in tourism or management programs. This approach benefits both the tourism industry and the students, providing the latter with valuable hands-on experience. However, a key challenge is the frequent turnover of students, which requires continuous investment in training. It could also be considered to involve retirees for different tasks to keep them engaged, a practice already implemented in some tourism regions of the canton. This approach provides both social and economic benefits for retirees and businesses alike.

Moreover, there are intangible resources, such as valuable local knowledge and expertise closely tied to the region, that can be leveraged for tourism. For example, intergenerational wisdom about medicinal herbs and nature can greatly enhance tourism, increase public awareness, and promote better health. The case study region already provides experiences led by local experts who have extensive knowledge of indigenous plants and their medicinal properties. This provides local experts with an additional source of income.

Two examples of utilizing natural resources are particularly noteworthy. First, animals can be employed to manage landscapes, a key asset for tourism. For instance, sheep can graze in vineyards and forests or help maintain rocky steppes in conjunction with goats. This is already practiced in the nature park region. The second example involves using worms to compost pomace that would otherwise be discarded. This method offers several benefits: it reduces freight transport, lowers costs and energy consumption related to transportation, and enhances marketing, image, and innovation for the business. Additionally, these benefits can be highlighted and valued during guided tours. Environmentally, it also reduces pollution. This approach could be applied to pomace that is not repurposed for oil, flour, or cosmetic products.

### *Resources of demand side*

Intangible resources related to the demand side encompass manpower, knowledge, skills, and capacities from tourists, including second homeowners and MICE (Meetings, Incentives, Conferences, and Exhibitions) tourists. Notably, second homeowners often have a strong attachment to their chosen location and are willing to invest in it. This aligns well with the needs of small enterprises that may e.g. lack the knowledge and workforce required to organize large events. The nature park also invites nearby businesses, their employees, local schools, and tourists to participate in maintaining pastures and restoring stone walls, which are crucial for biodiversity. This involvement not only raises awareness and sensitivity to these important issues but also strengthens a sense of community.

Financial resources of tourists and especially second homeowners are also interesting resources to help the tourism destinations. The authors focus on innovative approaches that go beyond traditional tourism taxes, local product purchases, and standard tourism services. One challenge of foresters e.g. is that services provided in the forest for recreational purposes incur costs, but tourism destinations often are unwilling to pay for them. Therefore, it could be beneficial for second homeowners to finance forestry work in exchange for free firewood. Another example from a nearby region involves a sponsorship system where tourists can become "adoptive parents" for animals such as dogs, cows, or sheep, thereby providing additional income for local farmers.

## **Discussion**

One of the aims of this paper is to analyse how unused regional resources can be valorised within a tourism context. By adopting a broad definition of resources, the study identifies various regional assets with valorisation potential, encompassing both material and immaterial aspects. Additionally, the paper explores how integrating circular value networks into a tourism destination can contribute to sustainable development.

Many examples highlight how by-products from local specialties present valuable opportunities for valorisation. These unique regional by-products can help differentiate the destination and enhance its appeal (Janin & Perron, 2014). A notable example from the case study region is the transformation of grape seeds into various products

and experiences. These value networks involve numerous stakeholders and offer cross-industrial collaboration opportunities, benefiting both local businesses and tourists. They also help build social capital within the region and can positively impact tourists' health, as by-products like grape seeds contain beneficial properties such as antioxidants. Developing wellness offerings around these by-products creates distinctive and memorable experiences for tourists. Moreover, they offer an opportunity to raise tourists' awareness about sustainability and the circular economy issues. These value networks contribute to regional added value creation and help reduce waste generation.

Food waste from restaurants, hotels, and shops can be better utilized by enhancing the entire service chain, which involves addressing gaps in existing offerings. For example, a food waste app that lacks a transport service could integrate with an existing ecological transport service in the destination. It is crucial to identify and leverage existing services to enhance value networks and create a more integrated service experience. In the context of food waste, raising awareness is also important. For example, by harvesting and processing unpicked fruit from local residents, tourists can learn about the principles of a circular economy and the issues surrounding food waste. Alongside economic and environmental benefits, integrating people with disabilities into processing activities can also generate social capital.

Other organic resources associated with the region's emblematic products also hold potential for tourism valorisation. For example, old wine barrels can be upcycled into furniture for hotels and tourists, while second homeowners—who form a significant portion of the case study region and often possess substantial financial resources—can contribute to this market. Similarly, old furniture from luxury hotels can be remanufactured by local craftsmen into unique pieces with a distinct history. This not only adds economic and environmental value through product life extension but also fosters a sense of exclusivity for the owner. This is particularly interesting in the emerging field of sustainable luxury tourism research (see Gurung et al., 2022). The storytelling aspect of these products is particularly appealing in a tourism context. Therefore, each tourism destination should seek out assets that can be upcycled and have potential for storytelling, reflecting the territory's unique heritage and history.

As the results of this study indicate, the valorisation of intangible resources is often connected to addressing current challenges in tourism regions, such as workforce shortages or the prevalence of seasonal workers with limited employment contracts. Better management of resources on the supply side might involve sharing a workforce between enterprises that require employees either in summer or winter, employing students from a nearby university's tourism program to provide them with practical experience, engaging retired individuals who want to feel needed, or offering opportunities to unemployed people to utilize their skills. While these strategies present certain challenges, they offer potential benefits for both the industry and the individuals involved. This approach generates economic benefits, such as reducing recruitment efforts for businesses, as well as social benefits through the integration of people with disfavoured working conditions or in search for work.

In addition to these obvious challenges, other more implicit issues can be addressed by leveraging unused workforce and knowledge. For example, the challenge of preserving biodiversity and maintaining landscapes can be addressed by involving tourists who are interested in learning about the environment and seeking meaningful experiences during their vacations. This approach aligns with the concept of meaningful travel (Câmara et al., 2023). Intangible cultural heritage, such as ancient knowledge of local medicinal plants, can also be valorised in tourism through experiential offerings. This aligns with Chembessi et al.'s (2024) classification of

resources, which includes knowledge on implementing circular and sustainable development practices.

On the demand side, intangible resources can include valuable knowledge from tourists, such as management expertise that can assist small local businesses in organizing events. Additionally, there is potential to creatively utilize the financial resources of tourists to support local community members, such as foresters or farmers. For example, they could provide financial support to these sectors in exchange for benefits such as free firewood or the opportunity to sponsor a cow or sheep. Second homeowners are particularly relevant in this context, as they often have a deep emotional and cognitive connection to the area, which fosters a desire to preserve and engage with it, according to place attachment theory (Stylidis et al., 2020). Additionally, their extended stays, facilitated by having a vacation home, further strengthen their involvement and commitment to the local community.

The study's results remain broad and warrant further exploration in future research. It is crucial to integrate CE principles in tourism with emerging approaches like regenerative tourism that seeks to create "net positive effects by enhancing the regenerative capacity of human societies and ecosystems" (Bellato et al., 2023, p. 1034) could complement the circular economy framework. This approach focuses on restoring economic, environmental, and social capital, as illustrated in some of the examples discussed.

Finally, the different insights presented above lead to the following hypotheses:

- H1: Regional value networks based on by-products of local products restore social, environmental and economic capital
- H2: Creating experiences and products that have a positive environmental impact attracts wealthy visitors from urban areas in search of meaning
- H3: By engaging underutilized human resources, social capital can be restored.
- H4: By involving tourists in nature preservation efforts, the environmental capital of the region can be restored.
- H5: By harnessing external human resources—such as the knowledge, skills, and financial support of second homeowners—economically struggling groups in tourism destinations, like farmers and small enterprises, can find new opportunities for growth and sustainability.

To sum up, there are numerous opportunities to leverage unused tangible and intangible resources within a tourism region. The real challenge lies in implementation and the willingness of various stakeholders to share their knowledge, embrace innovation, and break away from traditional mindsets. A nature park provides an ideal setting to experiment with and develop these approaches.

## Conclusion

This exploratory and holistic systemic study has identified numerous opportunities for integrating unused resources into tourism offerings through multi-stakeholder value networks in a circular and regenerative manner, resulting in economic, social, and environmental benefits. For example, grape seeds, a by-product of a local product, can be transformed into valuable experiences and products. Sharing seasonal workers or recruiting underutilized labor can address current challenges faced by tourism destinations. Additionally, exchanging knowledge and skills between locals and tourists can foster community building and strengthen social capital. Innovative strategies can be developed to mobilize financial resources for economically struggling stakeholders in the tourism sector.



This study contributes methodologically by developing an analytical framework that aids both scholars and practitioners in identifying unused resources within a tourism destination.

The study also advances theoretical understanding by emphasizing the significance of multi-stakeholder value networks and a systemic perspective on tourism destinations within the context of a circular economy. It underscores the need to integrate complementary concepts, such as the circular economy and regenerative tourism, advocating for a holistic approach that goes beyond the traditional focus on material and energy flows associated with the manufacturing industry. In tourism destinations, resources can be valorised in various ways, often involving the combination of different resource flows.

Given the exploratory and holistic nature of this study, the results remain broad. Future research should delve deeper into the various possibilities, guided by appropriate theoretical frameworks. Moreover, future research should focus on testing the presented hypotheses and evaluating the feasibility, desirability, and viability of the proposed solutions using a design thinking approach. This includes creating and testing prototypes, as well as developing qualitative and quantitative indicators to assess their impact on economic, social, and environmental sustainability. It is crucial to address the missing steps in the systemic design methodology and ensure that benefits at one level do not create negative impacts at another. Additionally, it is important to measure whether these values contribute to the restoration of economic, social, and environmental capital within a regenerative tourism framework.

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## About the authors

Dr. Sandra Grèzes-Bürcher is a senior researcher at the tourism institute of the University of Applied Sciences of Sierre. Delivers lectures on sustainability, alternative economic models and ecosystem analysis. She studied geography with a specialization in sustainable development and received her PhD from the University of Bern . She gained experience at the Swiss National Parcs Network, the Swiss Working Community for Mountain Areas, and her research interests are circular economy, sustainable tourism innovation, regional development and rural areas. The author can be contacted at [sandra.grezes@hevs.ch](mailto:sandra.grezes@hevs.ch)

Dr. Vincent Grèzes works as an associate professor of innovation management, and strategic and international management at the University of Applied Science Western Switzerland (HES-SO) in Sierre, and is director of the competitive intelligence track at the HES-SO Master of Integrated Innovation for Product & Business Development in Lausanne, Switzerland. He received his PhD in economic and strategic intelligence from the Faculty of Law and Political Science of the University of Lyon 3, France. His main research interests are competitive intelligence, the creation of shared values, business model innovation and collaborative and open innovation. Author can be contacted at [vincent.grezes@hevs.ch](mailto:vincent.grezes@hevs.ch)