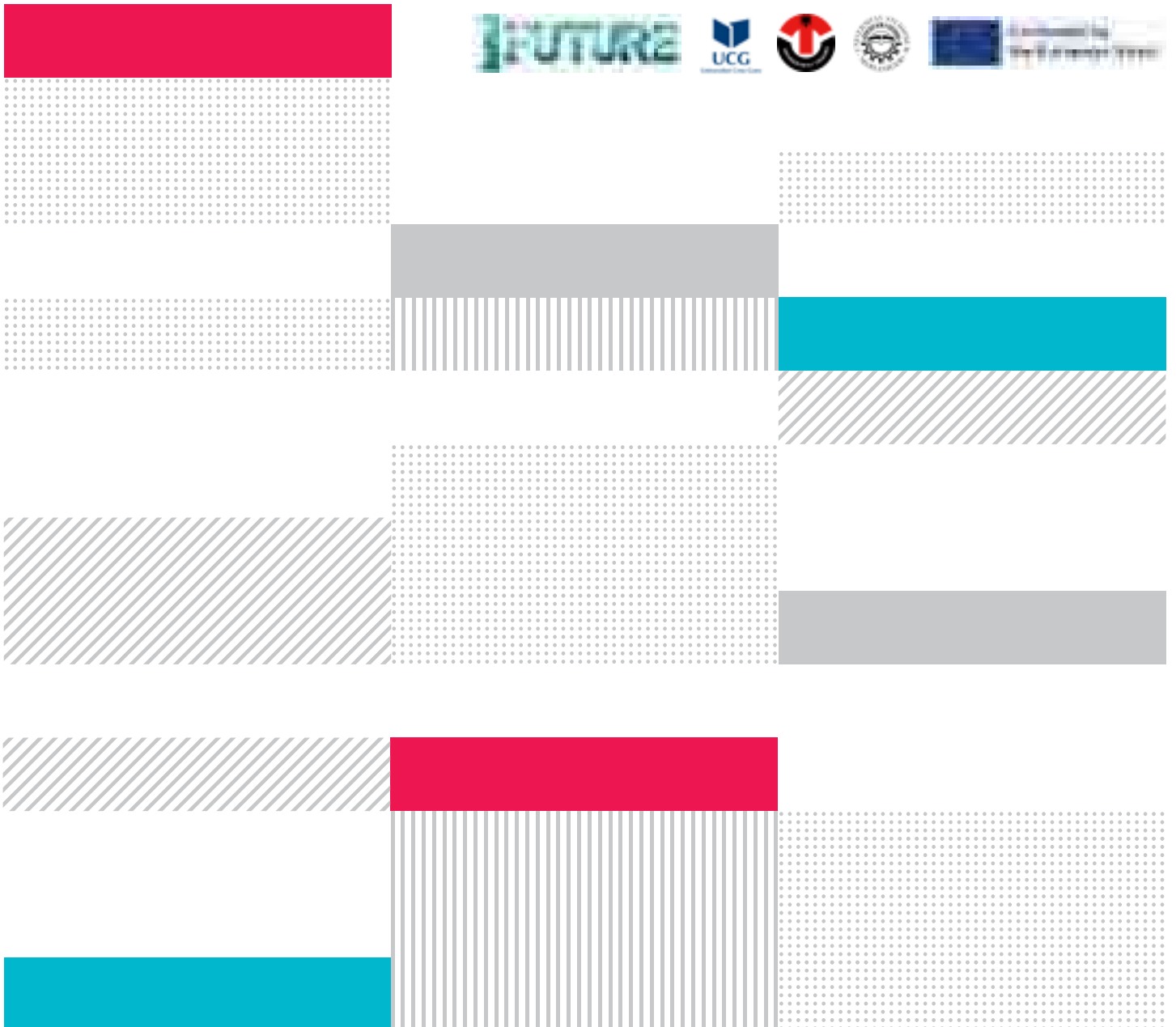


# 1FUTURE International Symposium



---

# Plastic waste reduction in restaurants and hotels along the Shkumbini River

---

Elona Pojani<sup>1</sup>

---

Zyra Mahmuti<sup>2</sup>

---

Perseta Grabova<sup>3</sup>

---

1 Associate professor, Faculty of Economics, University of Tirana  
*elona.pojani@unitir.edu.al*

---

2 Master of Science Risk Management, Faculty of Economics, University of Tirana  
*zyramahmuti@gmail.com*

---

3 Associate professor, Faculty of Economics, University of Tirana  
*perseta.grabova@unitir.edu.al*

## Abstract

---

Plastic pollution in the Shkumbin River Basin is now a major environmental and economic problem for Albania, especially for the hospitality and catering (HoReCa) industry. Field surveys done in 2024–2025 show that single-use plastics (SUPs), mostly PET bottles, LDPE bags, and disposable food service items, make up more than 70% of the visible trash along the river. The HoReCa industry has two roles: it causes a lot of SUP leakage and is also very vulnerable to the reputational and financial losses that come from polluted environments, fewer tourists, and higher operating costs. This study aims to evaluate the viability of transforming the HoReCa sector along the Shkumbin River from reliance on single-use plastics to more sustainable practices, including reusable systems, deposit-return schemes, and compostable alternatives. The analysis was supplemented with interview data from 5 business units operating along the Shkumbini river. The results show that the best way to reduce SUP leakage by 80–90% while still being profitable for businesses is to use reuse systems along with deposit-return schemes for PET and glass. Source separation and material recovery facilities (MRFs) are good for long-term sustainability, but they cost more up front. Although these transitions are expected to yield long-term benefits for the business sector—both in sustainability and economic performance, they necessitate financial commitments that many river-adjacent enterprises cannot readily meet due to constrained resources.

---

## Keywords

---

Plastic pollution, Shkumbin River, waste management, circular economy, HORECA sector, Albania

---

## 1. Introduction

---

Plastic pollution in Albania, especially in rivers, is a big problem for the environment. Rivers are the main ways that plastic trash gets into the Adriatic Sea. Plastics make up about 9.27% of municipal solid waste, but only 18.8% of it is recycled. More than 76% of it ends up in landfills. About 298,000 people are still outside of formal systems, even though there are services that pick-up trash [1]. The International Union for Conservation of Nature (IUCN) claims that Albania dumps about 8,000 tons of plastic into the Adriatic Sea every year [2]. The Shkumbin River Basin suffers from several pollution hotspots, especially in places like Prrenjas, Librazhd, Elbasan, and Peqin. The HORECA sector is particularly affected by the waste practices, being not only a polluter but also bearing the consequences of the pollution in the business performance.

The goal of this study is to find ways for businesses in the hospitality and catering sector (HoReCa) along the Shkumbin River to cut down on single-use plastic (SUP) waste and to look at the economic benefits of switching to more eco-friendly options. It builds on the "Low Plastic Zone" program, which helped 719 businesses in Albania cut down on SUP waste by 8.2% between 2023 and 2024 [3]. In particular, the paper aims to explore practices of selected business in using the SUP products and the environmental impacts of such use. In addition, the study will assess the economic implications of replacing single-use items (e.g., plastic bottles and cutlery) with reusable or compostable alternatives using data from the literature, evaluating the environmental benefits in terms of reducing plastic waste generation and minimizing leakage.

The paper is organized as follows. In the first part, a literature review, focusing on the concepts of plastic waste impacts and environmental cost benefit analysis is presented. Then, the second part of the paper describes the methodology applied, and the results of both qualitative analysis and quantitative data used for this research. The paper concludes in recommendations applicable to the HORECA sector.

---

## 2. Literature review

---

Plastic waste is considered the plastic that has been thrown away after it is no longer useful, either through formal waste management systems or informally in the environment. The European Environment Agency [4] considers plastic waste both durable and single-use plastics, like packaging, construction materials, and textiles. Globally, post-consumer plastics like packaging and bottles make up the most plastic demand, with packaging making up almost 40% of the total [5]. From a typological standpoint, plastic waste can be classified based on its origin and polymer composition. There are different kinds of polymers, such as PET, HDPE, LDPE, PP, PS, and PVC, each posing a different impact on the environment. Recycling technology also differs based on the type of plastic [2].

Marine ecosystems are particularly impacted by plastic waste. Through rivers, every year, about 11 million metric tons of plastic end up in the oceans, where it breaks down into microplastics that stay there for hundreds of years [6]. Microplastics are present in isolated ecosystems, including Arctic ice and deep-sea sediments, indicating their widespread distribution and durability [7]. Plastic pollution harms not only marine

habitats but also soils, agricultural productivity, and terrestrial environments by releasing toxic chemicals [8]. These materials can become part of everyday impacting human health life through food, air, or direct skin contact [9] [10]. The chemicals present in plastics like BPA and phthalates, can cause severe health effects [11].

Besides the environmental impacts, plastic pollution causes billions of dollars of loss every year, especially in tourism, fisheries, and the marine industry. "Ghost nets" or abandoned fishing gear, get caught in marine life and lower fish yields [12]. The tourism sector must pay fees for cleaning up beaches and coastal areas [13], and waste management systems have to deal with high costs because recycling and inefficient landfilling [14].

A key focus of contemporary research on plastic waste management is the evolution of consumption and waste systems via the incremental substitution of single-use plastics (SUPs) with reusable or compostable alternatives. This systemic change goes beyond just replacing individual products. It needs supporting infrastructure like deposit-return schemes, washing and refilling logistics, and material recovery facilities [15]. This transition has many benefits. For the environment, it stops plastic from leaking into rivers and landfills, reduces greenhouse gas emissions, and stops long-term microplastic contamination [16]. For businesses, it reduces repeated purchases and waste-management costs—particularly in the HoReCa sector, while also creating new jobs in the recycling and reuse industries [17]. For consumers, it builds trust and strengthens the image of businesses and municipalities as environmentally responsible actors [18].

Plastic waste management has become a central policy priority across Europe, given its environmental externalities and economic implications. In Albania, the issue is framed within an EU-aligned legal context, with particular emphasis on single-use items that dominate urban waste streams. As Albania aligns with the EU Single-Use Plastics Directive (EU) 2019/904, bans on items such as plastic cutlery, plates, straws, and expanded-polystyrene packaging induce operational change while enhancing investment in reusables, eco-certifications, and alternative packaging that can strengthen tourism competitiveness. The legal framework in Albania (Law No. 10463/2011, "On Integrated Waste Management") is in line with EU definitions. It prioritises plastic waste because of its size and the risks it poses for the environment [19]. About 9.2% of urban waste in Albania is plastic, and a major part of it comes from single-use packaging [1]. Phasing out single-use plastics in Albania is not only environmentally beneficial; it also advances circular-economy practices aligned with EU policy objectives. The planned introduction of extended producer responsibility (EPR) will further reallocate waste-management costs from municipalities to producers and importers, indirectly easing burdens on businesses and consumers and accelerating the transition to a circular economy. The next section will investigate this issue further, focusing on a particular context in Albania, the HoReCa sector along the Shkumbini River.

---

### 3. Study methodology

---

The study area in this research is the Shkumbini River basin, a crucial hydrological system in Albania, spanning roughly 181 kilometres from its origin in the Valamara Mountains to its discharge into the Adriatic Sea near Divjaka. The river flows through a variety of landscapes, such as mountains, farmland, and cities. This means that it crosses many different human activities that create and change the flow of plastic waste. There are

more than 250,000 people living in the basin area, which is about 2,445 km<sup>2</sup>. Some of the cities and towns in the area are Prrenjas, Librazhd, Elbasan, Peqin, Rrogozhina, and Divjaka, each carrying different waste management issues.

There were several reasons why the Shkumbini Basin was chosen as the study area. First, it represents a hotspot for pollution traveling to the Adriatic Sea, with rivers acting as pipes for plastic to flow from land to the sea. Second, the basin is home to cities and administrative units that have different abilities to collect, transport, and recycle waste. This makes it possible to study how social, financial, and institutional factors affect plastic waste outcomes. Elbasan is an urban municipality with a larger population and more industrial activity than rural municipalities like Prrenjas and Librazhd, where service coverage is often incomplete. This variety gives us a chance to look at different ways that plastic waste is made and moves. Third, the Shkumbini is a very diverse ecosystem that supports fish, plants along the riverbanks, and irrigation systems for farming. Plastic pollution threatens these functions by making the water less clean, blocking irrigation channels, and breaking up habitats. The river is important to society because many settlements have relied on it for water, farming, and transportation for a long time. Plastic waste not only damages the environment, but it also lowers the cultural and aesthetic value of the river, making it less appealing to tourists in places like Librazhd and Elbasan.

In terms of plastics, the Shkumbin River is one of the most polluted river basins in Albania. ETMI (2025) baseline studies show that plastics make up more than 70% of all riverbank litter. BeMed+ (May 2024) monitoring recorded 1,185 litter reports over four days, including 558 unitary items (PET bottles, LDPE bags, cups, food packaging), 31 bulky items (furniture, tires, construction plastics), and 596 accumulation zones where waste was uncountable. Observed spatial patterns show everyday consumption: PET bottles and LDPE bags dominate overall volumes; single-use food-service items (cups, plates, straws) cluster near city centers; and hygienic plastics (wet wipes, diapers, masks) point to improper disposal in household and healthcare settings. ETMI found that the plastic densities of hundreds of items per 100 meters were like those of rivers in Southeast Asia that are very polluted. These plastics are carried downstream to the Adriatic Sea, where Albania sends up to 8,000 tonnes of them each year [2].

**Table 1** – Plastic Waste in the Shkumbin River (ETMI 2025 & BeMed+ 2024)

Category	Description	Observations/Reports
Unit waste	PET bottles, plastic bags, cups, packaging	558 cases (May 2024)
Bulky waste	Plastic furniture, tires, construction parts	31 cases (May 2024)
Accumulation area	Large, uncountable volumes	596 zones (May 2024)
Composition	Plastic share in river waste	>70% (June 2025)
Most common types	PET, LDPE, PP, hygienic-sanitary	Present in all segments

**Source:** (ETMI 2025 & BeMed+ 2024)

## 4. Method and data

This study utilizes a mixed-methods approach, predominantly focusing on quantitative data from the HoReCa sector, supplemented by qualitative insights derived from interviews with business owners and managers. The main goal is to look at the costs and benefits of cutting down on single-use plastics (SUPs) and switching to more eco-friendly options. In summary, the methodology includes:

- a. **Qualitative survey and data collection:** Primary data were collected through semi-structured questionnaires distributed to five representative HoReCa businesses in Elbasan and Librazhd. They were used to collect data on the number of customers, SUP items usage, and monthly costs. This information was used to figure out the economic baselines for the current use of plastic and to test out different scenarios using compostable or reusable materials. This information was supplemented with qualitative interviews. Managers and staff from five representative HoReCa businesses took part in interviews sections. The interviews gave us information on behavioral factors, perceived obstacles to sustainable alternatives, and Albania's SUP regulations. These interviews also highlighted seasonal plastic usage variance, logistical issues (e.g., storage, disposal), and fine concerns, providing valuable qualitative insights to supplement quantitative data. Table 2 presents the basic profile of surveyed units, showing diversity in size, location, and seasonality.
- b. **Comparative cost analysis:** The study looked further at how much the selected companies spent on SUPs and alternatives each month and each season. To give a more accurate picture of the finances, hidden costs like waste transport, storage space, and possible legal liabilities were also included. To achieve this analysis adaptation from international studies (e.g., BeMed projects, Mediterranean tourism sector) were modified for the Albanian context to emphasize best practices and viable policy options.

**Table 2** – General Data of Surveyed HoReCa Units

Unit	Typology	Location	Employees	Clients/Day	Seasonality
Sopoti Caffe	Café	City center	5	100	All year
Imperial Hotel	Hotel	Rural/touristic area	20	200	All year
Bar Restorant Moglica	Restaurant	Rural/touristic area	10	120	All year
Balkan Hotel	Hotel	Rural/touristic area	18	180	Mainly tourist season
Vila Zeneli	Restaurant	Rural/touristic area	8	90	All year

**Source:** Authors' field survey and interviews (March–May 2025).

This design keeps the focus of the analysis on the HoReCa sector's practices and economic effects, rather than on the costs of the municipal system.

## 5. Results of the questionnaires and interviews

Interviews conducted with managers and employees from five HoReCa businesses (two hotels, two restaurants and one café) in Elbasan and Librazhd confirmed that single-use plastics (SUP) are used in the daily operations of the sector. All interviewees reported regular use of plastic bottles, cups, straws, plates and bags, with monthly expenses ranging from 40,000 to 120,000 ALL (400-1200 EUR), depending on the size of the business and the number of customers. Seasonal differences were also evident: urban hotels and cafés reported relatively constant use throughout the year, while rural and tourism-oriented restaurants recorded a significant increase in consumption during the tourist season. Managers emphasized that the main reason for the continued use of plastic is its low cost, wide availability and convenience. However, they expressed concern about the difficulties associated with storing and disposing of large quantities of plastic waste, noting that the lack of storage space and the need for frequent disposal make operations less efficient.

Regarding alternatives, most interviewees expressed a preference for biodegradable and compostable products (such as paper cups, wooden cutlery, and cardboard bags), which are perceived as better for the environment and more acceptable to consumers. However, their higher price—40–70% above plastic alternatives—was seen as a heavy financial burden, especially for small enterprises with limited profit margins. Managers emphasized that consumers expect prices to remain stable, which limits the ability to pass on these additional costs to them, necessitating state intervention through subsidies or fiscal incentives.

A recurring theme during the interviews was the awareness of the hidden costs associated with the use of plastic: costs for waste collection and transportation, the need for additional storage space for bulk packaging, and the fear of potential fines due to the increasingly rigorous enforcement of national legislation restricting SUPs. Despite the challenges, all businesses expressed interest in adopting more environmentally sustainable practices, provided that systemic mitigating measures are implemented. These include deposit-based return programs for bottles (DRS), municipal investments in recycling infrastructure, and consumer awareness campaigns to drive behavioral change. These findings highlight that the HoReCa sector has a high level of awareness of the environmental impacts of plastics and shows a willingness to transition, but the main obstacles remain the nature of economic costs and infrastructural deficiencies that limit the implementation of changes. Table 3 summarizes by theme the results of the process.

**Table 3** – Thematic matrix of interview results

Theme	Key Insights	Implications
Current Use of SUPs	All five businesses (2 hotels, 2 restaurants, 1 café) rely daily on plastic bottles, cups, straws, plates, and bags. Monthly spending ranges from 40,000–120,000 ALL, with seasonal peaks in tourist-oriented establishments.	Plastic use is structural to operations; any intervention must account for seasonality and demand patterns.
Barriers to Change	Plastics are cheap, convenient, and widely available, but storage and disposal create logistical burdens. Biodegradable alternatives cost 40–70% more, making them unaffordable for small businesses. Customers resist price increases.	Economic constraints are the primary obstacle; businesses need cost-sharing mechanisms (e.g., subsidies, pooled procurement) to adopt alternatives.

Theme	Key Insights	Implications
Hidden Costs Awareness	Businesses recognize indirect costs: waste collection/transport, extra storage space, and risk of fines under stricter SUP regulations.	Indicates growing pressure to transition and readiness to adopt change if systemic solutions are provided.
Willingness to Transition	All businesses expressed interest in environmentally friendly practices but stressed the need for enabling measures such as deposit–return schemes (DRS), municipal recycling investments, and consumer awareness campaigns.	Policy action should focus on infrastructure investment, financial incentives, and behavior change campaigns to enable a sector-wide shift.

Source: The Authors

## 6. Insights from a cost–benefit analysis and HoReCa sector case studies

Literature shows through a cost–benefit analysis (CBA) that preventing one ton of plastic leakage is estimated to generate €70 in benefits [20], including avoided collection, transport, and landfill costs, fewer riverbank clean-up operations, potential revenues from recyclables (PET, aluminum, glass), and improved tourism aesthetics. Among the strategies considered to achieve this, reusable systems combined with deposit–return schemes (DRS) provided the strongest performance, with program costs of €35 per ton and realized benefits of €49 per ton, resulting in a net positive balance of +€14 per ton. This option offers multiple co-benefits: it reduces SUP leakage by up to 80–90%, achieves high return rates for PET and glass containers, and is broadly supported by HoReCa businesses and urban consumers provided that adequate infrastructure is in place. Source separation with material recovery facilities (MRFs) ranked second-best, achieving near break-even performance (–€1.5 per ton) but representing a critical long-term investment for Albania’s recycling capacity and alignment with EU circular economy targets. Other measures—biodegradable products, single-use glass recycling, and awareness campaigns—were found to be important but insufficient on their own, with negative net balances ranging from –€32 to –€0.5 per ton. Table 4 summarizes the finding from selected literature sources.

**Table 4 – Cost–Benefit Summary of Plastic Reduction Options for the HoReCa Sector**

Option	Program Cost (€ / ton)	Capture Rate (%)	Realized Benefit (€ / ton)	Net Balance (€ / ton)	Remarks
Reuse + DRS (PET/Glass)	35	70	49	+14	Strong financial case; reduces SUP leakage by 70–90%
Source Separation + MRF	40	55	38.5	–1.5	Near break-even; builds long-term infrastructure
Biodegradables + Composting	60	40	28	–32	Requires composting facilities; expensive for SMEs
Single-Use Glass (Recycling)	45	50	35	–10	Viable only when integrated into reuse systems
Awareness Campaigns	10	15	10.5	–0.5	Low-cost but supportive measure, not sufficient alone

Source: Adapted from World Bank (2018), UNEP (2021), BeMed (2022), ETMI Baseline Study (2025)

These data were further contextualized using field survey data from five HoReCa units in Elbasan and Librazhd (two hotels, two restaurants, one café). The surveyed establishments serve 80–150 customers per day (cafés/restaurants) and 200–250 customers per day (hotels) during the tourist season, with a marked rise in SUP use during peak summer months (Table 2). Monthly plastic-related expenditures ranged from 40,000 to 120,000 ALL (400-1200 EUR) per business, depending on size and location (Table 5).

When compared to “green” alternatives—glass bottles, cardboard cups/plates, and wooden cutlery—the cost difference was significant: switching would increase monthly expenses by 40–70%, raising average monthly costs from about 66,500 ALL to nearly 158,000 ALL (665 EUR-1580 EUR) (Table 6). However, plastics also carry hidden costs, including 5,000–10,000 ALL (50-100 EUR) for transport, 3,000 ALL (30 EUR) for storage, and potential future fines. When these externalities are accounted for, the effective cost of plastic use rises to approximately 74,500 ALL (745 EUR) per month, narrowing the cost gap and strengthening the case for transition (Table 7).

Beyond the economic analysis, interviews revealed that managers acknowledge the logistical challenges of storing and disposing of large amounts of SUP waste and express growing concern about regulatory pressure. Most respondents favoured systemic solutions—such as DRS programs, municipal investments in recycling infrastructure, and consumer awareness campaigns—that would enable them to adopt reusable and recyclable alternatives without jeopardizing profitability.

**Table 5** – Monthly Plastic Consumption and Costs in ALL

Unit	Plastic Bottles (20 ALL)	Plastic Cups (2 ALL)	Plastic Plates (4 ALL)	Fork/Knife (3 ALL)	Plastic Bags (5 ALL)	Straws (1 ALL)	Total Monthly Cost ALL)
Sopoti Caffè	30,000	6,000	0	0	1,500	2,400	39,900
Imperial Hotel	72,000	9,000	12,000	9,000	3,000	3,000	108,000
Bar Rest. Moglica	36,000	4,800	7,200	4,500	2,250	1,800	56,550
Balkan Hotel	60,000	7,200	9,600	7,200	3,000	2,400	89,400
Vila Zeneli	24,000	3,600	4,800	3,600	1,500	1,200	38,700

Source: Authors' calculations based on interview data (2025)

**Table 6** – Monthly Costs for Green Alternatives

Unit	Glass Bottles (50 ALL)	Cardboard Cups (5 ALL)	Cardboard Plates (7 ALL)	Wooden Forks (6 ALL)	Cardboard Bags (10 ALL)	Paper Straws (3 ALL)	Total Monthly Cost (ALL)
Sopoti Caffè	75,000	15,000	0	0	3,000	7,200	100,200
Imperial Hotel	180,000	22,500	21,000	18,000	6,000	9,000	256,500
Bar Rest. Moglica	90,000	12,000	12,600	9,000	4,500	5,400	133,500
Balkan Hotel	150,000	18,000	16,800	14,400	6,000	7,200	212,400
Vila Zeneli	60,000	9,000	8,400	7,200	3,000	3,600	91,200

Source: Authors' calculations based on market prices and interview data (2025)

**Table 7** – Financial Comparison: Plastics vs. Green Alternatives

Material	Average Monthly Cost (ALL)	Hidden Costs (ALL)	Total Effective Cost (ALL)
Plastic	66,510	+8,000 (transport + storage)	≈ 74,500
Green Alternative	158,760	0 (no waste transport)	≈ 158,760

**Source:** Authors' calculations based on field data and cost estimates (2025).

**Note:** Calculations assume 30 days of operation per month.

Overall, these results confirm that no single measure is sufficient to tackle SUP leakage. The most effective pathway is a hybrid approach that places reuse systems and DRS at the center, reinforces them with MRF-based recycling infrastructure, and complements them with HoReCa-specific interventions (eco-certifications, refill systems) and public awareness campaigns to build consumer trust. This integrated model not only reduces SUP leakage immediately but also positions the HoReCa sector as a leader in Albania's circular economy transition, improving its competitiveness in tourism markets and aligning with EU SUP and extended producer responsibility directives.

## 7. Conclusions

This study has demonstrated that plastic pollution in the Shkumbin River basin constitutes both an environmental and economic challenge, with the HoReCa sector situated at the core of the issue and its resolution. Businesses in Elbasan and Librazhd provide evidence that using single-use plastics (SUPs) like bottles, cups, plates, and straws every day costs a lot of money each month, has hidden waste management costs, and can hurt a company's reputation. Plastics may seem like a good deal in the short term, but they create long-term problems for cities, local ecosystems, and the tourism economy.

The comparison of alternatives shows that no one option is enough on its own. Biodegradable products are still expensive and useless without composting infrastructure. Single-use glass only becomes competitive if there are deposit-return schemes (DRS) in place. Awareness campaigns are cheap and well-received by the public, but they don't do much good unless they are backed up by changes to the system. The best results come from a strategy that includes reusable systems, better recycling infrastructure, and targeted actions in specific areas, like banning single-use plastics and setting up refill stations. These steps can cut SUP leakage by 80 to 90%, bring Albania in line with EU rules, and make HoReCa businesses leaders in eco-friendly tourism.

A gradual and integrated transition is needed. Reuse and recycling should be the main parts of the system, with incentives, education, and legal compliance with EU policies as support. This change not only helps HoReCa businesses have a smaller impact on the environment, but it also makes them more competitive, builds customer trust, and gets the industry ready for the stricter rules that will come from the EU and national governments. So, dealing with plastic pollution in the Shkumbin River basin is not only good for the environment, but it is also a good chance for long-term economic growth.

---

## Literature

---

- 
- [1] Eurostat. (2022). Recycling rates in the European Union. Retrieved from <https://ec.europa.eu/eurostat>
- 
- [2] IUCN. (2020). National guidance for plastic pollution hotspotting and shaping action. Gland, Switzerland: International Union for Conservation of Nature.
- 
- [3] Milieukontakt Albania. (2024). Final evaluation of the Low Plastic Zone initiative. Tirana: Milieukontakt Albania.
- 
- [4] European Environment Agency (EEA). (2021). Plastics, the circular economy and Europe's environment. Luxembourg: Publications Office. <https://doi.org/10.2800/473368>
- 
- [5] OECD, 2022 OECD. (2022). Global Plastics Outlook: Economic drivers, environmental impacts and policy options. Paris: OECD Publishing. <https://doi.org/10.1787/de747aef-en>
- 
- [6] Jambeck, J. R., Geyer, R., Wilcox, C., Siegler, T. R., Perryman, M., Andrady, A., ... & Law, K. L. (2015). Plastic waste inputs from land into the ocean. *Science*, 347(6223), 768–771. <https://doi.org/10.1126/science.1260352>
- 
- [7] Tekman, M. B., Wekerle, C., Lorenz, C., Primpke, S., Hasemann, C., Gerdtts, G., & Bergmann, M. (2020). Tying up loose ends of microplastic pollution in the Arctic: Distribution from the sea surface, through the water column to deep-sea sediments at the HAUSGARTEN observatory. *Environmental Science & Technology*, 54(7), 4079–4090. <https://doi.org/10.1021/acs.est.9b06981>
- 
- [8] Rillig, M. C. (2012). Microplastic in terrestrial ecosystems and the soil? *Environmental Science & Technology*, 46(12), 6453–6454. <https://doi.org/10.1021/es302011r>
- 
- [9] Wright, S. L., & Kelly, F. J. (2017). Plastic and human health: A micro issue? *Environmental Science & Technology*, 51(12), 6634–6647. <https://doi.org/10.1021/acs.est.7b00423>
- 
- [10] Leslie et al., 2022
- 
- [11] Talsness, C. E., Andrade, A. J. M., Kuriyama, S. N., Taylor, J. A., & vom Saal, F. S. (2009). Components of plastic: Experimental studies in animals and relevance for human health. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1526), 2079–2096. <https://doi.org/10.1098/rstb.2008.0281>
- 
- [12] Richardson, K., Hardesty, B. D., & Wilcox, C. (2019). Estimates of fishing gear loss rates at a global scale: A literature review and meta-analysis. *Fish and Fisheries*, 20(6), 1218–1231. <https://doi.org/10.1111/faf.12407>
- 
- [13] Newman, S., Watkins, E., Farmer, A., Ten Brink, P., & Schweitzer, J. P. (2015). The economics of marine litter. In M. Bergmann, L. Gutow, & M. Klages (Eds.), *Marine Anthropogenic Litter* (pp. 367–394). Springer. [https://doi.org/10.1007/978-3-319-16510-3\\_14](https://doi.org/10.1007/978-3-319-16510-3_14)
- 
- [14] Jambeck, J. R., Geyer, R., Wilcox, C., Siegler, T. R., Perryman, M., Andrady, A., ... & Law, K. L. (2015). Plastic waste inputs from land into the ocean. *Science*, 347(6223), 768–771. <https://doi.org/10.1126/science.1260352>
-

- 
- [15] Geueke, B., Groh, K., & Muncke, J. (2018). Food packaging in the circular economy: Overview of chemical safety aspects. *Food Packaging and Shelf Life*, 18, 100–111. <https://doi.org/10.1016/j.fpsl.2018.06.001>
- 
- [16] Ragusa, A., Svelato, A., Santacroce, C., Catalano, P., Notarstefano, V., Carnevali, O., ... & Giorgini, E. (2021). Plasticenta: First evidence of microplastics in human placenta. *Environment International*, 146, 106274. <https://doi.org/10.1016/j.envint.2020.106274>
- 
- [17] Rochat, D., Binder, C. R., Diaz, J., & Jolliet, O. (2013). Combining life cycle assessment and risk assessment to screen and compare potential impacts of products. *Environmental Impact Assessment Review*, 43, 1–8. <https://doi.org/10.1016/j.eiar.2013.05.001>
- 
- [18] BeMed. (2021). *Beyond Plastic Med: Commit to a plastic-free Mediterranean Sea*. Monaco: Beyond Plastic Med.
- 
- [19] Adhami, E. (2022). Position paper on the single-use plastic ban in Albania: Policy framework and challenges. INCA Albania / BeMed Program.
- 
- [20] ETMI 2020.[Deliverable 1: Baseline assessment of plastic pollution along the Shkumbin River. Environmental and Territorial Management Institute, Tirana.
-