




## SwitchMed II in Lebanon

Demonstrating Sustainable Consumption and  
Production and Circularity Practices



نُدَوَّر  
nudawwer

## Food Circle Summary Report

Project Implemented by: 

July 2022 to July 2023

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### **United Nations Environment Programme**

The United Nations Environment Programme (UNEP) is the leading environmental authority in the United Nations system. UNEP uses its expertise to strengthen environmental standards and practices while helping implement environmental obligations at the country, regional and global levels.

UNEP's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

### **SwitchMed Programme**

The SwitchMed programme is funded by the European Union (EU) and implemented by UNEP. It aims at achieving a Circular Economy in the southern Mediterranean by changing the way goods and services are produced and consumed. In order to achieve this, the SwitchMed provides tools and services directly to the private sector, supports an enabling policy environment, and facilitates exchange of information among partners and key stakeholders.

### **Nusaned**

Nusaned is a Lebanese-based Non-Governmental Organization (NGO). Their aim is to empower and enable marginalized Lebanese communities by supporting sustainable development through a community-based approach. By offering access to food security, shelter, and continuous opportunities for creating productive economies, Nusaned works on building sustainable communities that are self-sustaining.

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# 1. Background

## 1.1 SwitchMed

The policy component of the **EU-funded SwitchMed programme**, led by **UNEP**, aims to develop and implement policies to switch to **Sustainable Consumption and Production (SCP) and Circular Economy (CE)** practices in Lebanon and 7 additional countries across the southern shore of the Mediterranean Sea.

Under SwitchMed I in Lebanon UNEP provided advisory services to the Ministry of Environment in the production and endorsement<sup>1</sup> of the Sustainable Consumption and Production National Action Plan ([SCP-NAP](#); SDG 12.1) with a focus on the industrial sector along the Litani Basin and Qaraoun Lake.

During SwitchMed II, considering the local context in Lebanon and as an entry point for piloting circular loops and SCP patterns, UNEP established a partnership with the civil society organization, Nusaned, to test SCP and CE practices and collect insights through a community-based demonstration project in the Mar Mikhael-Gemmayze area in Beirut. The project aims to develop impactful methodologies to:

- (i) **establishing circular loops with a focus on plastics and food waste**
- (ii) **reinforcing the greening of restaurants**

## 1.2 Sustainable Consumption and Production and Circular Economy?

Circular Economy is a concept and a model of consumption and production that builds upon value retention loops and involves several interconnected circular processes which are the 9 Rs: reducing by design, refuse, reduce and reuse, repair, refurbish, remanufacture, repurpose, and lastly recycle<sup>2</sup>.

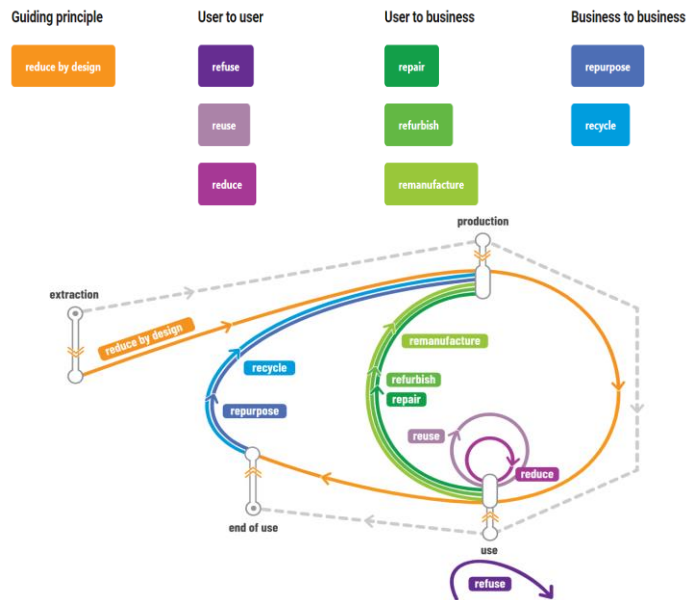


FIGURE 1 CIRCULARITY BUILDS UPON VALUE RETENTION LOOPS, AS SHOWN ON THE UNEP CIRCULARITY APPROACH

<sup>1</sup> The SCP-NAP was endorsed by the Lebanese Ministry of Environment and Ministry of Industry.

<sup>2</sup> <https://www.unep.org/circularity>

Sustainable Consumption and Production is about “doing more and better with less<sup>3</sup>”; which means maximizing the proper use of services, products, and resources to get the best possible outcomes with the least number of raw materials being wasted in the production phase. As for the consumption phase, shifting to sustainable practices involves changing consumers behaviour which will affect the ways of production.

SDG 12: Sustainable Consumption and production was adopted by the United Nations in 2015 as part of the 2030 Agenda for Sustainable Development<sup>4</sup>. It aims to ensure sustainable consumption and production patterns by reducing waste and pollution, increasing resource efficiency, and promoting the sustainable use of natural resources. The goal targets to promote responsible and sustainable management of resources and encourage environmentally friendly technologies and practices. The ultimate objective of SDG 12 is to achieve a sustainable future where economic growth, human well-being, and environmental protection are balanced and interdependent.



FIGURE 2 SUSTAINABLE DEVELOPMENT GOALS OF THE 2030 AGENDA

<sup>3</sup> [UNEP sustainable consumption and production policies](#)

<sup>4</sup> <https://sdgs.un.org/2030agenda>

## 2. Food Waste Challenge

Globally, in 2019, approximately 931 million tonnes of food waste were generated, enough to mitigate the global challenge of meeting the increased demand for food due to the growing world population, according to UNEP's [Food Waste Index](#) report. Food is grown, processed, transported, distributed, prepared, consumed, and even disposed of. Our current food systems – all activities from production to consumption and disposal of food – account for up to 37% of all greenhouse gas emissions.

Estimates suggest that 8-10% of global greenhouse gas emissions are associated with food that is not consumed. When food is disposed of in landfills, a considerable portion of this waste transforms into methane, a potent greenhouse gas with a global warming potential 25 times greater than that of carbon dioxide.

### 2.1 UNEP's Resolutions on Preventing and Reducing Food Waste

Being the custodian for the Food Waste Index ([SDG 12.3.1b](#)), UNEP is committed to promoting sustainable practices and innovative solutions to reduce food loss and waste in accordance with the United Nations Environment Assembly (UNEA) Resolution ([4/2](#)) 'Promoting sustainable practices and innovative solutions for curbing food loss and waste'. As part of this commitment, UNEP focuses on capacity building and advocacy facilitating experience and knowledge exchange to improve the enabling conditions necessary to achieve the goal of halving food loss and waste.

UNEA Resolution ([2/9](#)) on 'Prevention, Reduction and Reuse of Food Waste' emphasises the importance of collaborative efforts especially with other international organizations.

### 2.2 Food Waste in the Context of Lebanon

In Lebanon, the issue of food waste is a pressing concern, as outlined in UNEP's [State of Food Waste in West Asia](#). On average, each person in the country produces approximately 105 kg of food waste annually at the household stage, leading to a staggering total of 717,491 tonnes of food waste each year. This significant volume of food waste represents a valuable opportunity to alleviate hunger and address Lebanon's increasing food insecurity.

[Restaurants in Beirut are major contributors to food waste](#), generating a substantial 1,620 tons annually. This not only contributes to the waste problem but also results in the release of 4,110 tons of CO<sub>2</sub> emissions. This waste constitutes 0.15% of Lebanon's total organic waste, with Lebanese restaurants producing 34 kg more organic waste daily compared to others serving international cuisines. In 2019, the amount of restaurant food waste per capita (27.65 kg/year) ranked second, following households (104.66 kg/year) and surpassing retailers (15.64 kg/year).

The limited state of waste management infrastructure in Lebanon, combined with inadequate waste segregation practices at the household and business levels, presents a significant challenge which is compounded by the multi-faceted crises the country is facing. However, there is an opportunity to turn these challenges into positive outcomes by embracing SCP and circular practices, with focus on waste segregation, food waste measurement, redistribution, reuse, and composting, providing socio-economic and environmental benefits within the context of food waste in Lebanon.

### 3. Nudawwer - Pilot Project

UNEP collaborated with the Lebanese NGO “Nusaned” to implement the pilot project *Nudawwer* in Beirut. *Nudawwer* refers to a circular or continuous movement in Arabic and the root of the word may also be associated with recycling. Throughout the project duration (July 2022 – December 2023), the emphasis is on drawing lessons learned from the testing phase to instil circularity, particularly the concepts of prevention and reduction, rather than just promote recycling practices within the community.

The project is a community-based pilot in the Mar Mikhael - Gemmayze area in Beirut which seeks to address the challenges of reduction and prevention of food waste and packaging waste to divert them from landfills using concepts of the circular economy. Through awareness raising and capacity building activities, this project is introducing circular elements and sustainable consumption and production patterns into the neighbourhood to induce behavioural change and allow green businesses to thrive. *Nudawwer* addresses primarily SDG 12 (Sustainable Consumption and Production). The results of the project will serve as a foundation and blueprint for replication and scaling up across the country to influence policy action.

Both concepts of CE and SCP are interconnected and introducing such concepts to restaurants’ practices, and to the community, will reduce stress on the raw materials being used, diverge plastics and food waste from landfills and allow a healthier environment to flourish. For *Nudawwer*, the aim is to address (1) *User to User (Reuse and Reduce)*, (2) *User to Business (Repair)*, and (3) *Business to Business (Recycle)* components.

By creating a replicable model, *Nudawwer* seeks to promote the adoption of more sustainable practices and policies, with the potential for national impact, leading to a more significant contribution to the global efforts of preventing waste and circularity. This approach will ensure that the project's efforts have a far-reaching impact.

Shifting from a linear economy model to a circular economy model is achieved through “transforming every element of our take-make-waste system: how we manage resources, how we make and use products, and what we do with the materials afterwards”. With this approach, *Nudawwer* aims at achieving its objectives and contributing to the policy making strategies. This model has been created using the “UNEP Building circularity platform<sup>5</sup>” as a reference and exemplifies what *Nudawwer* will be achieving whereby UNEP will be playing an integral role in assisting in dissemination and policy recommendations at the national level.

#### **Mar Mikhael - Gemmayze Neighbourhood**

The project leveraged the dynamic restaurant scene in the *Mar Mikhael-Gemmayze* area in Beirut, to test SCP/CE elements that enable the establishment of a customized methodology to inspire circular practices and long-lasting behavioural change to prevent food waste and plastic waste pollution.

The neighborhood that the *Nudawwer* project is mainly residential and commercial. This area of Beirut is known as a lively bar and restaurant area, amongst the residential and business buildings. *Mar Mikhael-Gemmayze* are located at the eastern boundary of Beirut in the *Medawar* district which has a total population of 8,112<sup>6</sup>. They lie in a strategic location south of the Beirut port and are considered a main connection from the Beirut central district to the eastern suburb of Beirut.

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<sup>5</sup> <https://buildingcircularity.org/>

<sup>6</sup> [https://maps.mapaction.org/dataset/fe6fcedd-a678-44e4-831e-84699e1d8a5a/resource/8fa96dd0-b4cf-4709-8ddb-730c9b402d67/download/ma011\\_beirut\\_population-300dpi.pdf](https://maps.mapaction.org/dataset/fe6fcedd-a678-44e4-831e-84699e1d8a5a/resource/8fa96dd0-b4cf-4709-8ddb-730c9b402d67/download/ma011_beirut_population-300dpi.pdf)



## 4. Nudawwer Food Circle

The aim of the food circle is to understand the challenge of food waste in the neighbourhood and test methods to reduce and treat organic waste through addressing restaurants in the neighbourhood. The food circle focuses on involving restaurants in reducing food waste through sorting at the source and composting the unavoidable food waste, while raising awareness with the staff and clients.

### 4.1 Different phases of the Food Circle Component

The implementation of the food circle component is structured around four phases:

- (i) Undertaking an **in-depth assessment** of the “food waste” challenge at global, regional, and local level:

The project’s assessment phase began in the early stages of the project, July 2022 and extended till end of July 2023. The project adopts the waste hierarchy defined in the EU waste framework directive<sup>7</sup> which aims at preventing and reducing the negative impacts caused by the generation and management of waste and to improve resource efficiency. The assessment phase further allowed the implementing partners to get acquainted with UNEP’s work on food waste and reporting mechanisms.

- (ii) Develop a detailed **roadmap for implementation**:

Based on the outcomes of the assessment phase, an initial roadmap was developed to guide the project implementation. During the project implementation the roadmap was periodically updated and adjusted to best respond to the specific circumstances and contexts. Showing such flexibility is important to allow the concerned stakeholders to best respond to the needs, challenges, and opportunities.

- (iii) **Test / implement** the roadmap:

The core of the pilot phase lies in its **testing and implementation phase** bringing together various participants to implement and trial activities in line with SDG 12, with the goal to showcase the potential for SCP and circular practices within a neighbourhood in Beirut, considering the local context. As part of the project progress monitoring, assessment surveys were conducted in May 2023 to collect data on the knowledge, attitudes, and behavioural change of the restaurants. Monitoring involves the systematic collection and analysis of data to assess the progress and performance of the project. These surveys are a valuable tool as they directly gather information from the target individuals, allowing for a comprehensive examination and analysis of data.

- (iv) **Showcase** insights to inspire replication:

The different phases of the project implementation allowed to gather lessons learned and identify policy recommendations. This phase is key to inspire uptake and replication and allow the project to assure national ownership and sustainability.

The activities that were undertaken during the testing phase of the **food circle** are showcased in figure 3.

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<sup>7</sup> [https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index\\_en.htm](https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm)



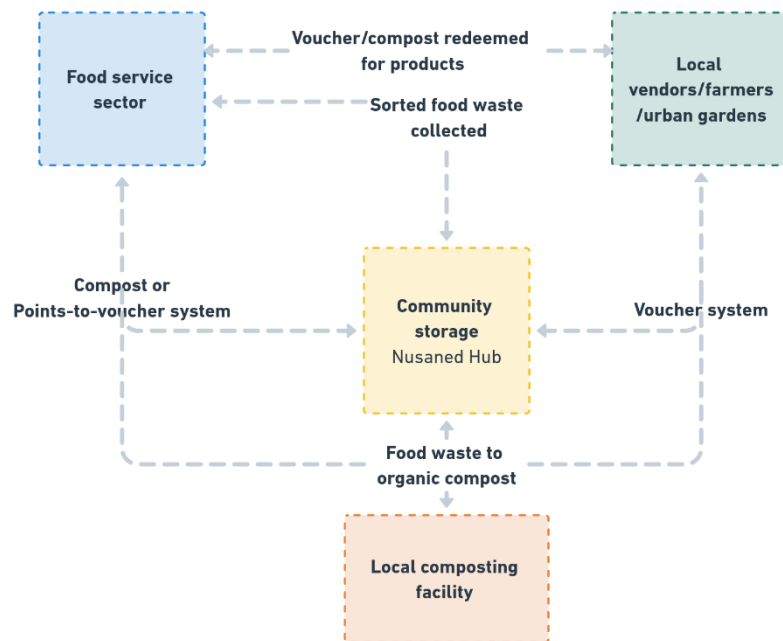


FIGURE 3 FOOD CIRCLE ACTIVITIES

## 4.2 Food Circle Good Practices

For the Food Circle Component, Nudawwer's model is a circular system that involves 10 restaurants<sup>8</sup>, in Mar Mikhael-Gemmayze in preventing and reducing food waste. Till end of June 2023, the system put in place diverted 20,564 kilograms of organic waste from landfill. The food waste was used to produce 550 kilograms of compost, which will be distributed among the restaurants, with a portion aiming to utilise the compost in-house and the remainder shared with their local farmers.

The system is designed with an aim to be self-sufficient, local, and environmentally conscious, as all the actors both provide and receive valuable resources, be it compost, vouchers, or promotional and educational awareness campaigns.

Nudawwer pilot project has adopted the lean start-up method which begins by “searching” for the business model and adapting the activities to the needs of the beneficiaries through testing, revising, and discarding hypotheses, continuously gathering beneficiaries’ feedback, and rapidly iterating on the process.

Among the good practices from the pilot exercise are:

### (i) Conduct weekly walk-through audits

Perform a walk-through audit on a weekly basis to gather data about the operational performance to identify strengths and weaknesses and address the risks that may arise. During the walk-through audit key observations about the operational performance were classified into: (a) general aspects, (b) service delivery by the internal team, (c) service delivery by partners and suppliers, (d) financing, marketing and (d) communications.

<sup>8</sup> Dar Beirut, Green Junkie, Baron, Le Petit Gris, Mayrig, Stairway, Starbucks, Kaake square, Salad Bar and SIP

**(ii) Engage in meetings/interviews with staff and beneficiaries**

Besides the weekly walk-through audits, it is advised to also follow-up on though meetings and interviews with beneficiaries and partners to allow each side to be on the same level of updated information. A strong interaction and exchange of information and data will allow to investigate areas of operational performance improvement.

**(iii) Train and inform involved stakeholders**

Selected stakeholders have received awareness training and one-on-one follow-up from the project implementation team. They have further been given access to information and good practices. Depending on the local context, sorting at the source may be a practice that is not widespread which may require additional effort to ensure that proper sorting at the source is being done, as is the case in Lebanon. Awareness raising on the importance of sorting at the source is crucial, with a focus on prevention and reduction at the household level and involving the private sector, as well.

**(iv) Implement regular waste composition analysis**

Monthly waste composition analyses allow gathering insights into the types and quantities of materials being discarded. This data provides essential feedback on whether restaurants are effectively separating recyclable and compostable materials. After which, personalized recommendations is given for each restaurant that may refer to altering ingredients in a certain recipe or being more attentive when throwing away waste.

**Waste Composition Analysis** allows for a further analysis of the mixed waste stream to identify materials that should not reach the Municipal Solid Waste (MSW). The materials found are sorted into different categories, weighed and recorded to provide recommendations based on the findings.

Example of the Waste Composition Analysis

Chart of waste composition in December



Non-organic materials and food found in general waste stream in December



Chart of waste composition in January



Non-organic materials and food found in general waste stream in January

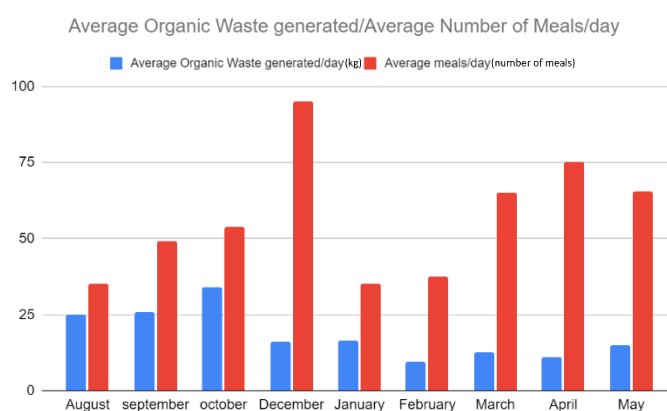


### (v) Leverage meal tracking for continuous improvement

Implementing a meal tracking system to monitor the number of meals produced in relation to the amount of organic waste generated is instrumental in optimizing the food waste reduction process. This data-driven approach highlights strengths and weaknesses in the waste management roadmap, allowing for adjustments that maximize efficiency and sustainability.

**Meal Tracking Analysis** compares meals prepared to the waste generated during their preparation. The waste factor shows statistically how much waste was created with every meal produced. With the numbers of prepared dishes, the sum of each day is graphed as “average meals/day” compared to the weight of waste produced each day, which is graphed as “average waste/day”. These values are used to find the waste factor: the weight of waste produced divided by the number of meals produced.

Example of Meal Tracking



**The amount of waste produced per meal in August 2022: 25 kg of waste/ 35 meals = 0.71 kg of waste/meal compared to the amount produced in April 2023: 11 kg of waste/ 75 meals = 0.15 kg of waste/ meal (78% decrease from August)**

### (vi) Ensure Compost Quality Control

Quality control of the produced compost is crucial. Collaborating with the Lebanese Agriculture Research Institute (LARI) ensures a rigorous analysis and comparison of the compost's key constituents to the optimum composition standards in Lebanon. This commitment to quality guarantees that the compost benefits both the environment and local agriculture, contributing to sustainable practices.

## 5. Food Circle Lessons Learned

Based on the food circle and UNEP experiences, the following lessons learned should be highlighted:

- Restaurants are fuelled by the ongoing global trend towards adopting sustainable operations and preventing, reducing food waste is an action that can be done without substantial changes to their operations and without incurring any costs to the restaurants. Conversely, socio-economic and environmental benefits are expected in return.
- Raising awareness among both restaurant customers and the local community on the socio-economic and environmental benefits accompanied by reducing and preventing food waste is key. Utilizing digital media and in-person engagement can effectively communicate the importance of preventing, reducing and recycling food waste.
- Providing trainings, information and best practices to restaurant staff and owners is crucial, as well as constant follow-up. It enhances awareness of food waste prevention and proper sorting practices, which are essential for the success of waste diversion programs.
- The initial placement of composting units in an urban area highlights the importance of considering the environmental impact of such operations. Composting can produce odors and other potential nuisances and placing them in densely populated residential areas can lead to concerns about air quality and overall environmental health.
- The points-to-voucher system to be redeemed at local MSMEs can be an effective way to encourage participation and engagement in a community CE program to encourage prevention, reduction, reuse and recycling while supporting the local economy.
- Restaurants may be hesitant to share private information such as number of meals offered, number of customers. It is important to incentivise restaurants to share this information as it is instrumental in analysing and improving sustainable consumption and production practices. Sharing aggregated data tracking with a comparative chart showing reduction in food waste from other restaurants, has proven to be an effective measure to motivate other restaurants to share their data.
- Implementing a meal tracking system allows for the quantification of changes in consumption and production practices. This data can help tailor waste reduction strategies and improve the efficiency of restaurant operations.
- Consistent and meticulous data collection from daily and monthly operations is essential for project success. This data offers insights into performance, enabling the identification of strengths, weaknesses and actions to be taken.
- Ensuring the quality of the produced organic compost through testing and collaborating with relevant quality control authorities and adherence to national standards is necessary to maintain the integrity of the product.
- The adoption of a CE model offers urban businesses increased access to financing, rendering them more appealing to investors and lenders, paving the way for innovation and the development of sustainable technologies that suit the local context. Consequently, CE not only guarantees economic growth but also enhances competitiveness within urban environments while ensuring the creation of more employment opportunities.