AI4 WASTE

FOSTERING AWARENESS AND INNOVATION IN ADULT EDUCATION

2023-2-PT01-KA210-ADU-000184346

TOOLKIT

Case Study #1 of

Zero Waste Management

This publication was developed by the ERASMUS+ project consortium the Erasmus + project AI4Waste: Fostering Awareness and Innovation in Adult Education with the number 2023-2-PT01-KA210-ADU-000184346 coordinated by Lipor - LIPOR – Associação de Municípios para a Gestão Sustentável de Resíduos do Grande Porto, Portugal.

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SUMMARY

Rapid population growth, phenomena such as industrial development and urbanisation in developing countries where Turkey, has also been brought about in the solid waste problem. The collection of waste management in urban areas, the system of transport and storage are inadequate (Yılmaz and Bozkurt, 2010). Today, world cities produce about 1.3 billion tons of solid waste annually and its volume is expected to increase to 2.2 billion tons by 2025 (Hoornweg and Bhada-Tata, 2012). The production of waste in parallel with the rising population has become difficult to manage as a global concern (Ayeleru et al., 2018). Waste generation rates will be more than double in low-income countries over the next twenty years. The environmental sensitivity is not fully realised and the excessive consumption culture has an important place in this problem. In particular, minimising this situation affecting waste generation will be an important step in waste management. Waste generation and recovery, which constitute the first principle of waste management, can be realised in this way. This principle which accepted all over the world has also started to be implemented in our country; but far behind the rates of developed countries (Akdogan and Gulec, 2007). When we look at our country, many of the cities also have difficulties in separating, collecting and disposing of their waste. It is aimed to waste manage by zero waste projects which are widely implemented in the present day. However, the institutions and organisations that support these studies, especially the universities that are active in this field, serve as examples in the development of this consciousness. In a way, universities can be considered as small-scale cities, which are established in quite large areas today, where there are many human activities and they have quite different effects on the environment (Adeniran et al., 2017). The importance of universities in promoting sustainable development is emphasised in many important declarations such as the Talloires Declaration (1990), the Halifax Declaration (1991), the Swansea Declaration (1993), the Kyoto Declaration (1993), Students for a Sustainable Future (1995) (Mason et al., 2003). With this understanding, waste management in universities should be handled and implemented in an integrated manner within the scope of sustainability in order to minimise all environmental negativities including consumption of resources and all emissions and wastes formed. Waste management, recycling and based on the efficient use of resources is a sustainable element. With the recovery, significant savings will be achieved in both raw material costs and generation costs of the products (Burlakovs et al., 2018). The large amount of waste to landfill areas brings about many environmental problems such as air, water and soil pollution (Zelenika et al., 2018). By preventing these problems from occurring, it will be ensured that the resources that form the basis of sustainability will be used effectively. In addition to this, burning and composting as a result of incineration are the methods that provide sustainability (Akdogan and Gulec, 2007). Most modern societies are applied integrated waste management systems to recycle and recover of the waste. But as well as the optimal recycling or resource recovery with the notion of zero waste, in addition to requires the elimination of unnecessary waste generation in the first step of designing a product (Zaman and Lehmann, 2013). In order to make the waste management healthy and accurate, it is necessary to know the waste composition. After this, it is decided how to dispose of waste and how it is to be evaluated in terms of economic and sustainable development (Kemirtlek, 2018).

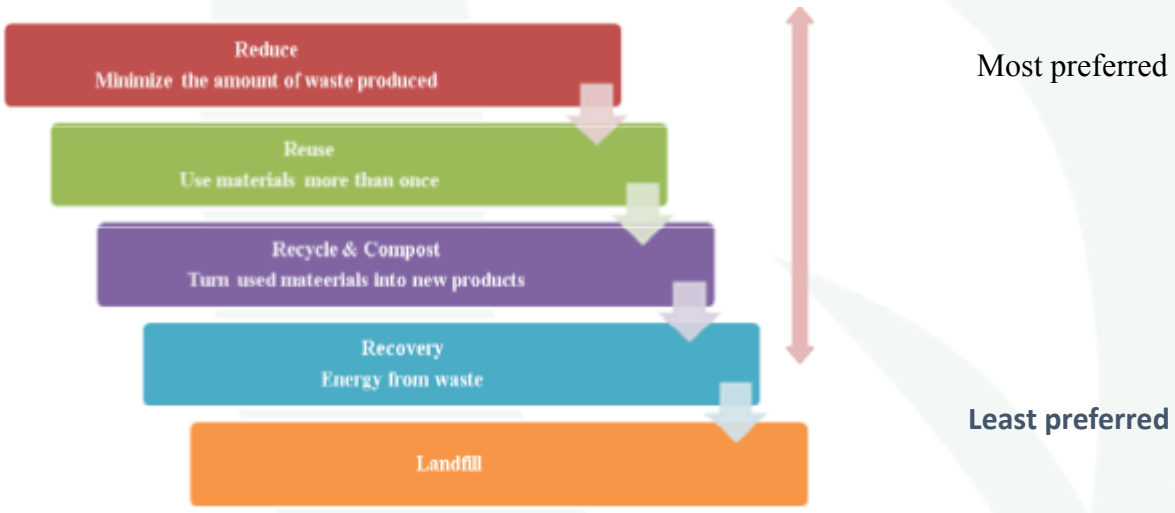
Waste collection system

The wastes that have been produced up to now in the OMU were transferred to Yılanlı Dere, which is located away from the settlements in Samsun province, without being separated with garbage trucks by the municipalities. Zero waste management 193 Due to the fact that waste management systems could not be installed completely, the waste collection, separation and storage operations could not be performed at the desired target. Collected wastes in here were continued to pollute the environment as waste were buried on land. With the zero waste works, separation containers have been provided to collect the wastes generated in our university separately according to their types. Temporary storage areas have been created in the appropriate areas determined within the university for the wastes accumulated in separation containers. The waste collected from the temporary storage areas at the waste collection centres is agreed with licensed firms and the recycling of waste is aimed at more environmentally friendly systems. In addition, efforts are made to realise the training of individuals by the competent people and leaders, to create a vision on zero waste and to transfer them to the way of life through sustainability.

Waste characterisation and recycling potential

For the wastes produced in the OMU, the first aim is to prevent waste and to use resources more effectively and efficiently. If the waste generation is inevitable, firstly, reducing the amount of waste, waste parsing the wastes at the source, sending them to the recovery facilities and providing value added to the economy by obtaining raw materials or energy are among the other objectives. Finally, it is aimed to ensure that the nonrecyclable wastes are properly disposed of without harming the environment and human health (Figure 4).

Figure 4 Zero waste hierarchy (see online version for colours)

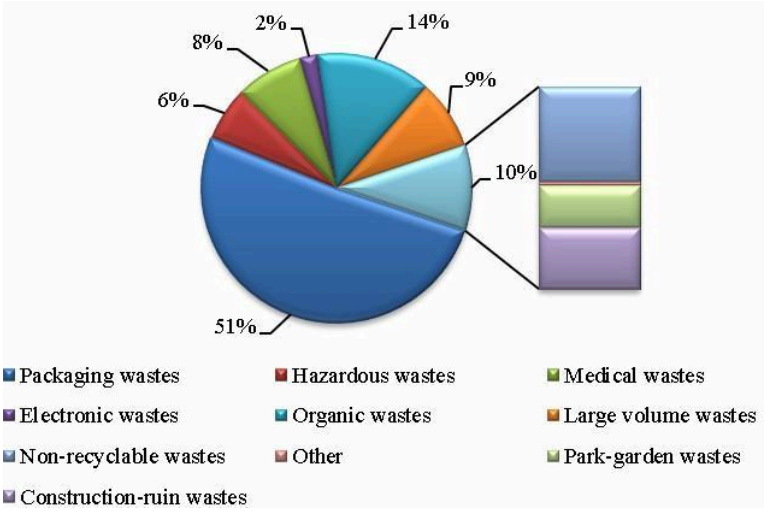


Percentages of waste on type and quantity scale in the university

As of 2018, zero waste works have been started in OMU and quantity inventories of the generated wastes are obtained from each unit and calculated on a weekly basis according to type. The percentages of the total amount of waste calculated by the obtained data in the total amount of waste are as shown in the graph in Figure 5.

According to the preliminary data obtained at the OMU, it was calculated that the total of 8,597 kg (kg/week) waste production per week. The majority of the total amount of waste is composed of packaging wastes at a rate of 51%. Packaging wastes with high recycling potential are collected in separation trays located at the university, and thus wastes recycled to the economy and the environment.

Figure 5 According to types, waste distribution rates in the OMU, September-2018 (see online version for colours)



CONCLUSIONS

Waste management is one of the most important issues in the world. Increased waste generation is one of the direct effects of rapid urbanisation, economic growth and consumption. The amount of waste is a negative notion which shows the inefficient and misuse of the resources of the societies. Waste production is not only a source of environmental and human health impacts, but also a serious threat to the consumption of valuable natural resources. Therefore, sustainable waste management is an important issue that should not be ignored for the protection of human health and the environment. To date, various waste management strategies have been developed under the heading of sustainable waste management, such as integrated waste management. Especially the conservation of resources, pollution control and integrated waste shortcomings experienced in the progress of recovery issues and problems in the management approach, different methods applied in the past people have been pushed beyond the planning application. Subsequently, zero waste management, which we think of as an emerging and innovative method has emerged as an integrated waste management system in the last decade. It is necessary to ensure the continuity of zero waste management which is spreading rapidly and developing many strategies. With every step taken towards the full education and contribution of all stakeholders, sustainable waste management will reach a much more successful level. In our country, there is an adaptation process with waste management and zero waste work suddenly while talking about landfill sites and regular storage. This is also present in our university as in our country, but the value and importance of the project has been explained through trainings and this process has been tried to be accelerated. While preparing an integrated waste management regulation, studies are being carried out to disseminate this notion. In these studies, it is necessary to monitor the system in order to ensure complete establishment, training and sustainability, otherwise the sustainability of the system will be difficult in countries such as Türkiye.

Co-funded by
the European Union