

Measuring Environmental Performance in Local Level in the framework of the targets set on Waste Framework Directive

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The rapid growth of world population, the urbanization trends and the economy and technology development have influenced to the life quality, and also the way of goods production and consumption resulting an increase in the amount of municipal solid waste production (MSW) (Compa et al., 2018, Gupta et al., 2015). Waste management is a complex and intractable environmental, social and economic problem for all modern societies (Cervantes et al., 2018), and with climate change and water scarcity are considered the three biggest environmental problems in the world (Gambella et al., 2019).

According to World Bank predictions, annual waste production will increase from 2.01 billion tonnes in 2016 to 3.40 billion tonnes in 2050. The average MSW production in the European Union (EU) for 2016, amounted to 483 kg / capita per year, while for Cyprus amounted to 640 kg / capita of which 46% was recycled or composted, while 25% was allocated for landfill (Eurostat, 2018) and it is estimated that 1.3 billion t/year are foods waste (including edible and inedible foods) (Loizia et al., 2019). Although MSW represent only about 10% of total waste produced in the EU is one of the most complex flows to manage due to their diverse composition, the high volume of producers and segmentation of responsibilities (COM / 2018/656).

The international concerns about the state of the environment had begun since 1960 when the scientific committees observed the image of earth from space and understands the concept of finite planetary boundaries (WWF, 2015). However, crucial key for changing habits and perception of environmental impact, was the report from World Commission on Environment and Development (WCED) in 1987 (Brundtland et al., 1987). The document «Our common Future» defined the term Sustainable Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The report aims to balance economic development, social well-being and cohesion, and environmental protection.

The achievement of the goals of sustainable development is directly related with the circular economy model in order to minimize the international environmental impacts such as climate change, the irrational use of natural resources and the waste production (Kirchherra et al., 2018). Also, there is a need to develop Strategy(ies) in the Framework of Waste Management in order to reach the targets on 2050 (Zorpas, A.A 2020). A circular economy is an economic system of closed loops in which raw materials, components and products lose their value as little as possible, renewable energy sources are used and systems thinking is at the core (MacArthur, 2015). The transition to a circular economy requires focus to the reuse, repair, renewal and recycling of existing materials and products (Korhonen, 2018). What was

previously considered "waste" can be converted into raw materials (Leipold and Petit-Boix, 2018).

As mention above one of the biggest environmental concern is the uncontrolled waste production and the inadequate management methods. Solid waste management systems are becoming more complex in many countries as well as in local authorities with the move from landfill-based to resource recovery-based solutions, following the setting of international and national targets, to divert waste from landfill and to increase recycling and recovery rates (Zorpas et al.,2015). Waste Framework Directive (WFD) establishes the legal framework for the management of waste within the European Union setting specific goals and aims to protect the environment and human health through the prevention of waste generation. Member States should take measures for the treatment of their waste in line with the following hierarchy, which is listed in order of priority: prevention, preparing for reuse, recycling, other recovery, energy recovery, and disposal (Zorpas and Lazaride, 2013).

The main aim of this research is the evaluation of the environmental performance of the Municipality of Sotira, a small newly established Municipality in the Famagusta District of Cyprus, through the management of municipal waste and comparing its results with the objectives of the Waste Framework Directive and circular economy model. For this purpose the following methods/ models were used: (a) qualitative method for the collection of primary data; (b) a quantitative and qualitative analysis of the composition of the MSW taking into account ASTM D 5231-92 / 2003 'Standard Test Method for Determination of Unprocessed Solid Waste,(Zorpas et al., 2018) c) SWOT analysis d) used of environmental performance measurement indicators. Diagram 1 shows the main result of the waste compositional analysis took place for the municipality. Home composting is considered to be the best available technique for competent authorities in order to develop and apply a complete strategy to treat organic waste (mainly food waste) (Zorpas et al., 2020).

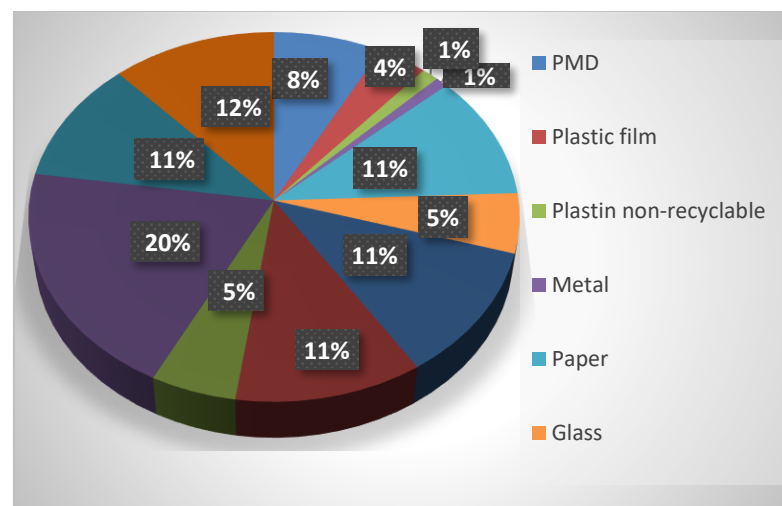


Diagram 1: Waste compositional analysis results (%)

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