SOCIETY + COMPOST EARTHWORMS= COLLECTION CENTERS: A SUCCESS STORY IN THE TRANSFORMATION OF URBAN ORGANIC WASTE IN PUEBLA, MEXICO.

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INTRODUCTION

In 2015 the production of municipal solid waste (MSW) in Mexico reached 53.1 million tons, of which, 54.4 % corresponded to organic waste. However, said organic waste is disposed of in landfills without being separated (Figure 1), therefore hindering its subsequent treatment (SEMARNAT, 2020). The free community collection center of Puebla is a facility where people take their organic waste (Alarcón, 2020; SEMARNAT, 2020) to be treated later by vermicomposting, in addition, it represents a solution to the concern regarding the handling of said organic material. Therefore, the social and environmental impact of the free community collection center for organic waste in Puebla, Mexico was measured.

Figure 1. Mexico is drowning in garbage (QUO, 2017).

MATERIALS AND METHODS

Number of participants and weight of organic waste. The number of people who made use of the collection center during a three-month period was measured (Figure 2). Moreover, the incoming organic waste was weighed by the use of a scale (150 kg ± 1 kg).

Survey to determine the area of influence of the organic waste collection center in Puebla, Mexico. A survey was performed to discover social participation in the collection center, determining the number of neighborhoods in the city of Puebla, including the quantity of participating neighborhoods in the city of Puebla, as well as the average number of family members engaging in the program to obtain the average amount of organic waste generated by family per week.

Figure 2. Participant leaving his organic waste in the collection center in Puebla, Mexico.

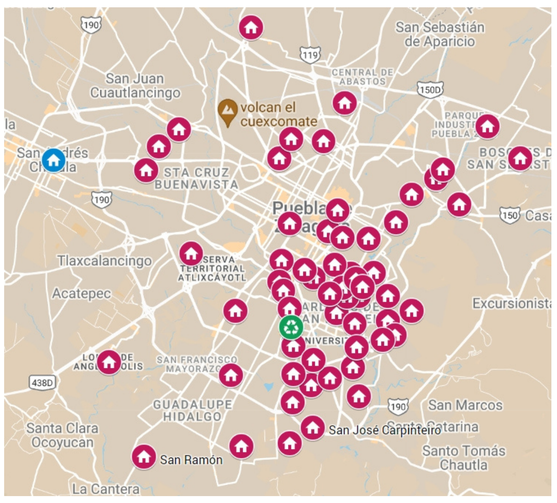

Figure 3. Area of influence in the organic waste collection center in Puebla, Mexico

Projection of organic waste collected in one year. Based on the data from the weighing of the organic waste, an annual projection of the reception of aforementioned waste in the collection center was calculated, using the linear regression method, as well as the prediction of the production of vermicompost and liquid extract from the vermicompost.

RESULTS

Figure 4. Transformation by vermicomposting of collected organic waste.

132 families utilize the services of the collection center which represents a participation of approximately **528 people** who make up the project. In addition, each family generates an of average **12.3 kg of organic waste per week,** which **in one year** is equivalent to **640 kg** of organic waste per family with an impact on **61 neighborhoods** of Puebla and its surroundings (Figure 3).

1.6 tons of organic waste is collected weekly at Puebla´s collection center. Hence in one year it is estimated that **88.5 tons of organic waste** are received and can be transformed into **29.5 tons of vermicompost** and **10,000 L of liquid extract** of vermicompost (Figure 4).

Due to the separation of the origin of the waste, the quality of the vermicompost increases.

CONCLUSIONS

The implementation and operation of a community collection center for organic waste in Puebla is socially viable by virtue of an increasing trend of citizen participation due to concern for the care of the environment by the citizenry.

The environmental impact of the Puebla collection center is encouraging, since in one year it has prevented 88.5 tons of organic waste end in landfills.

The organic waste collection center is a system of receiving organic waste which is correctly separated since its origin, which facilitates its subsequent treatment by vermicomposting and obtaining a quality product (vermicompost and liquid extract).

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