

Food and Agriculture Organization of the United Nations









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MAKING EVERY VOICE COUNT FOR ADAPTIVE MANAGEMENT (MEV-CAM) GOOD PRACTICES: ENGAGE, LEARN, INSPIRE

COMPOST AS SOLID WASTE MANAGEMENT IN JORDAN

BACKGROUND

Zaatari Refugee Camp (ZRC), in Northern Jordan, is the seventh-largest refugee camp globally, and it hosts around 80 000 Syrian refugees. This new population generates 34 metric tons (MT) of waste, which is collected and trucked out of the camp daily. Disposing the solid waste has become one of the most serious environmental problems in Jordan, with much of its waste ending up in landfill.

FAO in Jordan established a 16 MT capacity waste processing facility within the framework of the *"Enhancing resilient livelihoods and food security of host communities and Syrian refugees in Jordan and Lebanon through the promotion of sustainable agricultural development"* project, funded by the European Union through its Regional Trust Fund in Response to the Syrian crisis (MADAD). The project is implemented by FAO in cooperation with the Jordan Ministry of Agriculture, World Food Programme and the International Fund for Agricultural Development. As a result, nearly 1 000 tons of waste is turned into compost annually.

Composting is an excellent way of reducing the amount of solid waste going into landfills. It is a natural breakdown process which turns raw organic materials into biologically stable organic fertilisers or soil conditioner. Compost is crucial in the agricultural sector because of its positive effect on soil and plant health, without damaging groundwater. This practice has improved the sustainability of the ZRC, provided jobs for refugees and improved soil conditions for local farmers.

MEV-CAM'S GOOD PRACTICES AT A GLANCE

This good practice was extracted by the Food and Agriculture **Organisation's Making Every Voice** Count for Adaptive Management (MEV-CAM) initiative, working alongside communities participating participating in the MADAD project in Zaatari Fefugee Camp. This document aims to show the impact of good practices on local communities, from their own perspective.

MEV-CAM will share these insights through the South-South Cooperation Knowledge Gateway, a platform designed to link the local knowledge held in these good practices with technical guidance.

WHAT HAS THIS PRACTICE ACHIEVED?



Since 2019, 89 Syrian refugees trained on composting, including 43 women and 46 men



40 green jobs created in the ZRC, including 23 women and 17 men



Waste has been reduced by around 15 percent

FIVE SIMPLE STEPS TO IMPLEMENTATION

Solid waste is discharged and moved to sorting areas, where workers separate recyclable and compostable materials from non-recyclable waste. The organic waste is then transported to the compost yard. At this point, the organic waste is cut and shredded. Chunks of around two centimetres is the optimum size for composting, increasing the surface area and facilitating better aeration.

The compost is then spread out on the ground to dry - this is called the compost yard. The optimal moisture content is around 60 percent. This takes around a week in rainy weather, five-six days in cloudy weather and several hours in the sun. To check the moisture, take a handful of compost and press it slightly for a few seconds. If the sample is sticky and shiny, with no gaps between components, this means the moisture content is very high. If the sample is slightly sticky and there are gaps between components, the moisture content is between 40 to 60 percent and is suitable for compost.

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Once the moisture level has been reached, it is necessary to mix and turn the compost to aerate it and facilitate the compost process. As decomposition takes place, the temperature should begin to rise. It usually reaches the hottest stage - called the thermophilic stage - within four days in winter and one day in summer. During this important stage, compost generates heat to eliminate pathogenic bacteria, and this aeration is most important to reduce and regulate the compost temperature and moisture content as microorganisms use up oxygen in their close quarters quickly. When the temperature drops in the thermophilic phase, it is necessary to turn the compost.

Check the compost pile temperature daily with a metal thermometer to monitor the compost phases and take action if required. If the temperature does not rise, then there is a problem with ventilation. If there is a strong smell of hydrogen sulfide (H2S), similar to the smell of rotten eggs, this is due to some anaerobic spots in the compost pile. This means aeration is not enough or there is high humidity in the compost. The solution is to open the composting pile and spread it for aeration and to reduce the moisture content.

Most pathogens are efficiently removed during the composting if it reaches a temperature of 55°C for three days. However, solar sterilisation can also be used at the end of the process. Before the compost is packaged, spread the compost over the ground with a depth of 20–30 cm. Spray the compost with some water, cover with transparent plastic, and weigh the edges down with sandbags to prevent air from entering. Stir and moisten the compost after two days, then leave it for another 5 days without any stirring. Twelve total days is enough to kill all pathogens. Once all pathogens have been removed, the compost is ready to be used.

TIPS FOR REPLICATING THIS PRACTICE

- Always wear cut resistant gloves, protective glasses, masks, and protective clothes.
- Be aware of items that are not composable, such as meat, fat, oil, bones, milk, and dairy products because they attract insects, plants containing pesticide residues, feces of animals because they contain pathogens, and sawdust resulting from manufactured or painted wood.
- Turning compost too often (every day) in mesophilic phase 2 disrupts the formation of the fungi and actinomycetes that do much of the composting work.

WHY SHOULD THIS PRACTICE BE UPSCALED?

Replication

- Improving solid waste management systems ensures waste is more sustainably managed, avoiding filling up landfill sites.
- Composting contributes to the health of local ecosystems and local livelihoods by creating an organic fertiliser.
- The produced compost is transferred to forestry nurseries managed by the Ministry of Agriculture to produce forestry and rangeland seedlings.
- The refugees working at the facility earn money through a cash for work programme, meaning that it provides green jobs and skills training, enabling them to earn money and invest in the local economy.

• Gender

- This waste management and composting centre in the ZRC has a sizeable gender element, with women and men participating equally.
- The enclosed and sanitary environment in the ZRC's waste management centre offers a safe working area for women who would otherwise perform manual labour due to traditional social norms.
- A total of 92 Syrian refugees (54 percent women, 46 percent men) have been hired as employees in the MRF, benefiting a total of 493 household members.
- A total of 92 Syrian refugees (50 female; 42 male) participated in training in waste management and waste sorting, in particular in the extraction of organic matters from collected waste.

Sustainability

- Composting and waste management is a sustainable practice that can be continued after the project's completion. Refugees who have been trained to sort waste and implement the composting process can pass this knowledge on to others.
- Composting requires very few inputs other than the waste itself, therefore is economically sustainable.
- Refugees can then use their knowledge on composting in their home gardens, improving their families' nutrition and food security.
- The circular economy approach to waste management connects waste management with energy generation, enlarging revenue generation, green job creation, and cost reduction of waste management with seedling generation for rehabilitating forests and rangelands in the host communities.
- Each component waste collected from the camp, compost extracted from organic wastes, and electricity generated by the biogas unit connected to a water pump inside the Waste Water Treatment Plant to pump out the treated water to be used in a water irrigation system for nurseries in the camp, and green job creation for both refugees and host communities are interconnected maximizing synergies to ensure sustainability, impacting actions towards Humanitarian-Development Nexus.

INTERESTED IN LEARNING MORE?

- <u>Production of renewable energy with waste in</u> <u>Jordan | The Global Compact on Refugees |</u> <u>UNHCR (globalcompactrefugees.org)</u>
- FAO. 2020. Compost from organic bio solids Production, socioeconomics and impact on the soil productivity. Amman. https://doi.org/10.4060/ca9916en
- FAO: South-South Cooperation Gateway
- Improving Rural Livelihoods and the Environment Through the Integral Utilization of Residues of Treated Waste Water and Organic Solid Waste for the Production of Renewable Energy and Compost in Mafraq Governorate of Jordan - TCP/JOR/3602 (fao.org)



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