



## **GENERATING RENEWABLE ENERGY AND CREATING GREEN JOBS TO IMPROVE LIVELIHOODS FOR REFUGEES AND HOST COMMUNITIES IN MAFRAQ GOVERNORATE**

Jordan has been severely impacted by the crisis in the neighbouring Syrian Arab Republic, with Mafraq Governorate in particular hosting one of the largest populations of Syrian refugees.

The project aimed to enhance the economic growth potential of the local economy of Mafraq, and particularly of Zaatari municipality, through an innovative intervention promoting private sector enterprise development and stimulating the creation of decent green jobs in an environmentally sustainable manner. Specifically, it aimed to improve livelihoods with increased green job opportunities for the most vulnerable communities in the area, and to enhance environmental conditions through integral utilization of residues of treated waste water and biosolids in order to generate renewable energy and compost.

The generation of renewable energy, in particular, was to be achieved through the adoption of sustainable and labour-intensive “waste to energy” and “waste to compost” processes.

The anticipated benefits of this action were threefold: (i) a reduction in greenhouse gas emissions, (ii) a decrease in the costs of solid and liquid waste disposal in Zaatari municipality, in particular in the Zaatari refugee camp, and (iii) the generation of green job opportunities.



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### **WHAT DID THE PROJECT DO?**

The project aimed to achieve its overall objective through interlinking clusters of activities. Specifically, these comprised (i) the generation of renewable energy utilizing solid organic waste from Zaatari municipality and solar energy (the Solar Water Heating (SWH) system), (ii) the creation of green jobs through the construction and operation of a solid waste segregation unit in Zaatari, (iii) the production of compost (organic fertilizer) compliant with Jordanian standards for the application of biosolids, and (iv) training of unskilled workers from Zaatari municipality, in particular the Zaatari refugee camp and their employment in the operation and maintenance of the solid waste segregation unit, biogas plant and the composting plant through an existing cooperative society.

### **IMPACT**

The project established an innovative model of livelihood improvement through a waste-energy-environment platform. It successfully enhanced the humanitarian-development nexus in the Zaatari refugee camp through the creation of green jobs opportunities, which, in turn, were achieved through the generation of renewable energy and production of compost from waste in a refugee camp environment.

Furthermore, a relevant impact was made in the form of the policy component, thanks to the historic agreement among the relevant ministries on the reuse of biosolids in Jordan and the activation of the process of harmonizing national standards and Ministry of Agriculture (MoA) regulations related to them.

### **KEY FACTS**

**Contribution**

USD 3 298 220

**Duration**

January 2016 – June 2021

**Resource Partner**

European Union

**Partners**

Ministry of Agriculture, Ministry of Planning and International Cooperation, National Agriculture Research Centre, Municipality of Zaatari

**Beneficiaries**

Syrian refugees in Zaatari camp and host communities in Mafraq Governorate, as well as agriculture producers, particularly pastoralists

# ACTIVITIES

- In conjunction with the local research institution National Energy Research Centre (NERC), which is part of the Royal Scientific Society (RSS) and which provided technical supervision, the project completed the design, construction, installation and test-run of a pilot biogas-based electricity generation plant in Zaatari. The electricity is produced by reusing sludge and organic waste from the camp.
- The pilot plant includes a SWH system to convert sunlight into heat. 30 solar radiation collector plates heat the 2 400 cubic metres of water in the cylindrical water storage tank. This is needed to raise the temperature of the digester in the biogas plant.
- As part of this activity, young Jordanian engineers and personnel from the Ministry of Water were trained in the technology.
- Solid waste segregation unit and a stabilization plant for the production of compost designed and constructed, with the employment of Syrian refugees.
- Syrian refugees were involved in the solid waste sorting activities carried out at the Material Recovery Facility (MRF). In the first quarter of 2020, the MRF scaled up waste inflow to its full capacity of 16 metric tonnes per day, with the number of refugees working at the facility increasing from 30 to 61.
- Organic waste was used to produce compost for research activities with the National Agriculture Research Centre (NARC) and for tree nursery activities with the MoA. The other solid waste (plastic and metals) was sorted and recycled through collaboration with the project stakeholder at the camp.
- Research into the production and use of compost from organic waste was carried out in conjunction with the NARC.
- Extensive national dialogue held with the relevant stakeholders and ministries with the aim of informing policies and decision-makers on the safe use of biosolids in agriculture. This resulted in an historic agreement to harmonize national standards and the Ministry of Agriculture regulations on the use of biosolids in Jordan.
- Tree nursery designed in Zaatari refugee camp to establish a circular economy model by using the resources generated by the project, namely the compost, biogas/electricity and treated water, to obtain tree seedlings through green jobs for refugees.
- Pioneering theoretical training carried out on biogas technology, in particular targeting Jordanian engineers and technicians.



SUSTAINABLE DEVELOPMENT GOALS

## Project Code

FAO: GCP/JOR/017/EC  
Donor: ENI/2015/368-692

## Project Title

Improving Rural Livelihoods and the Environment through the Integral Utilization of Residues of Treated Wastewater and Organic Solid Waste for the Production of Renewable Energy and Compost in Mafraq Governorate of Jordan

## Contact

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## Partnerships and Outreach

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