Selective Collection
Of The Organic Waste In Tourist Areas

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www.biowaste-scow.eu

Introduction

Biowaste Management Challenges

One of the main challenges in countries of the Mediterranean Basin is sustainable waste management, in particular the management of biowaste. As biowaste represents the largest fraction of MSW (Municipal Solid Waste), it is therefore of particular importance. In the countries of the Mediterranean Basin, food waste represents the predominant fraction of biowaste, reaching up to 30%-50% of total MSW production.

Strategies aiming to prevent and divert biowaste (and food waste, in particular) from disposal can have significant outcomes, in particular addressing urgent environmental threats within this area:

Effective and economically sustainable collection schemes for biowaste represent the first step to produce quality compost, that can be used to mitigate soil erosion, desertification and enhance organic content in agricultural land improving its production as well as the fixation of carbon in soils.

Diversion of biowaste for recycling has a direct effect in reducing the environmental impacts of waste disposal due to landfilling of MSW; it limits the emission of greenhouse gasses (GHG) and leachates that may pollute ground water. It also reduces the use of landfill space.

Additionally, the introduction of separate collection schemes and models promote the development of a strong waste management sector with the creation of green jobs, even propitiating the effective regulation and involvement of the current informal recycling sector.

In summary, the prevention of biowaste is the first objective of any management plan. This should be followed by correct management of this fraction (in terms of quality and quantity of the collected flow and selection of sustainable management models), which result in improved environmental problems in the Mediterranean Basin. This includes reducing desertification and improving the productivity of agricultural soils (applying quality compost to soils), reducing global warming (avoiding the disposal of biodegradable materials to landfills and enhancing the soils' role as a carbon sink) and reducing reliance on landfill. Generally speaking, the aim of biowaste recycling can be considered to be the backbone of a modern and sustainable management solution for MSW.

A common and coordinated strategy within the Mediterranean Basin is therefore welcome. It can lead to faster adoption of measures and MSW management practises that aim to achieve the above mentioned environmental and socio-economic benefits, as well as contributing to support the North and specially Southern countries of the Mediterranean area in finding

sustainable waste management solutions. This includes improved management of waste according to specific waste arisings, cultural and cooking habits and potential needs for assuring long term sustainability of agricultural land. This is set against a backdrop of increasing population and worsening effects due to climate change.

BIOWASTE MANAGEMENT PROBLEMS	BIOWASTE MANAGEMENT CHALLENGES
• Lack of organic carbon in soils • Soil erosion and desertification • Low fertility, loss of agricultural land • Chemical fertilisers/pesticides use • Landfill impacts: biogas, lixiviates, space occupation, etc. • Methane impacts on climate change • Loss of recyclable materials by mixed collection	• Acting at the first stages of the management chain • Closing the cycle of biowaste • Introducing appropriate drivers and specific targets • Promoting high quality biowaste separated at source • Implementing efficient and adapted collection schemes • Deploying biowaste recycling capacity and economically and technically sustainable facilities • Ensuring quality compost to be applied to soils • Developing awareness, training and know-how transfer activities • Fostering monitoring and benchmarking

The SCOW Project

The European 3-year (2013-2015) Project SCOW (Selective Collection of Organic Waste) in tourist areas and valorisation in small-scale composting plants has been developing low cost, technically simple and high quality organic waste stream collection and recycling models for implementation in the Mediterranean Basin, in territories with touristic areas and agricultural activity. SCOW's goal was to define an innovative and sustainable biowaste management system through effective collection and waste treatment into decentralised small-scale

composting plants, located near biowaste generation sites, and, at the same time, where the compost can be applied, as we are talking about areas with extremely low content of organic carbon in the soil.

At the end of the project 14 composting plants and approximately 400 composting modules have been implemented in Catalonia, Corsica, Liguria, Upper Galilee, Palestine and Malta. It means attending a total population of almost 14.000 people and 600 economic activities, developing a total treatment capacity of 8185 tons per year (totally reached in 2016 when facilities will be in full operation):

- 7741 tons of biowastes plus bulking agent composted in facilities.
- 4785 tons considering only foodwaste and farm wastes (without bulking).
- 4000 tons considering only foodwaste (without bulking)

The strategy for separate collection of the biowaste was adapted for each territory, depending of the density of the population, its seasonality, the geography, the climate and also the cultural circumstances. At the end, the project designed different models to achieve the maximum efficiency for source separate collection of biowaste: from in-situ treatment (community composting) to road containers and door-to-door collection. Specific vehicles for collection and/or mixing were also designed and built or adapted in some cases. The priority always was to reach the maximum quality of the biowaste collected, essential for the correct operation and efficiency of the treatment facilities.

Although a general model of simple composting facility was designed, it had to be adapted to the circumstances of each area and to the characteristics of the biowastes generated and collected. The composting systems that are being used varies from the classical home and community composters to electromechanical composters for those areas where there was not possible to build a composting facility. For small facilities three composting systems were adapted:

- Turned windrows and maturation heaps for municipal biowaste, manures and agricultural wastes in Palestine (West Bank), developing their own composting machinery by local manufacturers.
- Static forced aerated yards for municipal biowaste composting in Pallars Sobirà (Catalonia).
- Closed and dynamic drums, designed and built locally, in Upper Galilee for foodwastes and green wastes generated in kibbutzs.
- The close drum system is complemented in some zones with composting “modules” (community composters with 1 m3 capacity) serving groups of few households or a single business as well as educational centres and other public facilities.

The project addressed one of the main challenges of the Mediterranean Basin that is the waste management and particularly of the biowaste (the most generated stream especially in the southern countries of the basin). The project has improved local sustainability, economy (creating new waste management job opportunities) and organization, while at the same time, it can strengthen the competitiveness of the territories (particularly the agricultural sector). In terms of sustainability, the application of quality compost contributes to improve land structure, functions and fertility, closing the cycle of this material. It also helps to reduce desertification (applying compost to soils), global warming (avoiding the entrance of biodegradable materials to landfills and capturing carbon in soil) and landfilling capacity needs (reducing waste entrance).

As one of the main objectives of the project is that the experience can be replicated in other Mediterranean areas reducing the impacts at source with a separate collection and treatment of biowaste, introducing the idea of self-sufficiency and closure of the organic matter cycle. In this sense a lot of outputs are addressed to disseminate the knowledge gained (such us methodologies and protocols, data collection, recommendations):

A. **Database of Good Practices**
B. **Guidelines and protocols for model definition**
C. **Handbook on small-scale composting facilities management**
D. **Handbook on compost marketing**
E. **Educational and communication materials.**
F. **Protocols for developing campaigns and collection staff training**
G. **Protocols for training the facility managers. Protocols for the use of modular composters.**
H. **Policy recommendations: Manifesto for proper food waste management in Med Area**
I. **Med Compost Network www.medcompost.net**
J. **Webgis http://scowproject.envipark.com**
K. **SCOW Website: www.biowaste-scow.eu**

All these outputs are available on the SCOW website: www.biowaste-scow.eu

Protocols to implement a biowaste management model with small-scale facility

***See list of documents and resources above listed**

Initial study and agreements

Activity	References*
Legal/strategy Framework (local, regional, national, international and licenses to manage and treat waste)	K, A, B, H, I
Regional and local waste management (production, selective collection, treatment, landfilling, type of wastes, etc. Authorities in charge of the management)	K, A, B, H, I
Features of the selected zone to implement the model (type of producers, density, distances, etc.)	K, A, B, H
Arrangements with the involved stakeholders and authorities (including final compost users). Agreements signature	K, A, B, H

Design of the model

Activity	References*
Selection of the best and suitable model taking into account the initial assessment and needs of the zone	K, A, B, C, D, H, J, I
Estimation of the tones collected throughout the year, quantity and type of the users involved (households, large and singular producers, others) ant their necessities	K, A, B, C, D
Design of the collection model and material/equipment needed. Cost assessment (implementation and operation)	K, A, B, J, I
Design of the treatment system and equipment needed. Cost assessment (implementation and operation)	K, A, B, C, D, J, I

Activity	References*
Feasibility study of costs and incomes/grants. Consider compost selling. Comparison with the landfilling option.	K, A, B, C, D, J, I
Environmental assessment of the model and estimation of other benefits (jobs creation, improvement of organization, link to farmers, etc.)	K, A, B, C, D, H, J, I

Implementation and start-up

Activity	References*
Calendar and planning for the implementation	K, A, B, C, D, F, G
Construction project of the facility. Take into account the calendar of construction and permits obtaining	K, A, B, C, D, G
Procurement tenders and process for the facility, equipment and other material. Take into account the calendar needed	K, A, B, C, D, G
Construction of the facility, accesses and supplies	K, A, B, C, D, G
Detailed design of the collection system (including equipment, personnel, routes, collection protocols, transferences, TIC, etc.)	K, A, B
Procurement tenders and process for the equipment and other material (bins, bags, etc.). Take into account the calendar needed	K, A, B, F
Reception of the material and equipment. Take into account the calendar of production and transportation	K, A, B, F
Procurement tenders and process for collection service development. Or arrangements and contract revision with the actual collection company	K, A, B, F
Design of the communication activities and campaign	K, A, B, E, F

Activity	References*
Procurement tenders and process for communication activities development and material production	K, A, B, E, F
Development of communication actions. Training of the educators and mentors	K, A, B, E, F
Start-up of the collecting service. Training of the personnel, operation protocols definition	K, A, B, F
Start-up of facility operation. Training of the personnel, operation protocols definition	K, A, B, C, D, G
Modular composters: delivery and training of the users	K, A, B, C, D, G

Operation, follow up and improvements

Activity	References*
Operation of the collection system and facility	K, A, B, C, D, I
Definition of the strategy for Compost marketing	K, A, B, C, D, I
Compost production, marketing and application	K, A, B, C, D, I
Definition of monitoring protocols, data collected and indicators	K, A, B, C, D, I
Application of the monitoring protocols, data collection. Monitoring forms and platforms	K, A, B, C, D, I
Assessment of the model functioning and application of adaptations and improvements	K, A, B, C, D, I
Sharing and comparison of the results and indicators with other models	K, A, B, C, D, I, J