DECISIVE

A DECentralized management Scheme for Innovative Valorization of urban biowastE

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Deliverable D3.10

ORDP – Data Management Plan

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Distribution List

- On the project Portal
- On the DECISIVE Intranet (http://decisive.psutec.com/)

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1. Executive summary

As stated in the proposal, the WP 3.3 takes part in the "Pilot on Open Research Data[1]" as suggested in the H2020 guidelines. It aims at making final results and when possible, intermediate results of this WP (mainly in the form of spatial datasets) available for free to access, reuse, repurpose and redistribute.

This deliverable aims at defining the specific data management plan (DMP) for the WP 3.3 which is a key element to comply with the Open Research Data requirement. This document follows the guidelines on the "FAIR Data Management in Horizon 2020"[2]. It describes the data that will be produced by the WP3.3, the file formats and the metadata standard used and the sharing and the archiving strategy.

The DMP for the overall project has been described in D8.4 and the DMP described here is specific to the WP 3.3.

This document is the first version of the DMP. It will be updated over the course of the project to add details on the data that will be published or if there are some changes in the consortium policies or consortium composition.

2. ADMIN DETAILS

Project Name: DMP for the work package 3.3 of the DECISIVE Project, funded by Horizon 2020 ("spatial approach for designing the decentralized urban biowaste valorization network") - DMP title

Grant Title: 689229

Principal Investigator / Researcher: Irstea

Description: The growing attractiveness of cities leads to increasing population, thus rising energetic and food demands in urban areas. This makes urban waste management increasingly challenging, both in terms of logistics and environmental or health impacts. To decrease the cities' environmental impacts and to contribute to a better resilience of urban areas towards energy or food supply crisis, waste management systems have to be improved to increase recycling of resources and local valorization. In this context, The DECISIVE project proposes to change the present urban metabolism for organic matter (foods, plants, etc.), energy and biowaste to a more circular economy and to assess the impacts of these changes on the whole waste management cycle. Thus, the challenge will be to shift from an urban "grey box", implying mainly goods importation and extra-urban waste management, to a cooperative organization of intra- and peri-urban networks enabling circular local and decentralized valorization of biowaste, through energy and bio products production. Such a new waste management paradigm is expected to increase the sustainability of urban development by: 1-promoting citizens awareness about waste costs and values; 2-promoting renewable energy production and use in the city; 3-developing an industrial ecology approach that can promote the integration between urban and peri-urban areas, by providing valuable agronomic by-products for urban agriculture development and so improving the balance of organic products and waste in the city; 4-developing new business opportunities and jobs. In order to achieve these objectives, the project DECISIVE will develop and demonstrate eco-innovative solutions, addressed to waste operators and public services.

The work package 3.3 of the project, handled by Irstea, is focused on *a spatial approach for designing the decentralized urban biowaste valorization network*. It also takes part in the "*Pilot on Open Research Data*" as suggested in the H2020 guidelines. Therefore final results and when possible, intermediate results of the 3.3 work package (mainly in the form of spatial datasets) will be free to access, reuse, repurpose and redistribute.

Funder: European Commission (Horizon 2020)

[1] https://www.openaire.eu/opendatapilot

[2] Europea Commission, H2020 Programme, Guidline on FAIR Data Management in Horizon 2020 - V3.0, 2016

3. DATA SUMMARY

The DECISIVE project proposes to change the present urban metabolism for organic matter to a more circular economy (food waste, partly in connection with further digestible biowastes to heat and power from biogas and further material products, resulting from SSF processes) and to assess the impacts of these changes on the whole waste management cycle. One objective of the project, addressed by the work package 3.3, is to **design the decentralized urban biowaste valorization network** based on **a spatial analysis**.

In a first step, **data will be gathered** about:

- Locations and if possible characteristics of the sources of organic matter
- Locations and characteristics of the potential output for the products coming out of the process (energy, digestate, by-products)
- Location of rural, peri-urban and urban farms in the target areas
- Location of the current biowaste treatment systems (incineration, landfilling, biological, etc.)

Information will be either collected from existing database (OpenStreetMap, some official database like BD Topo or SIREN in France, etc.) or created based on surveys.

In a second step, those data, completed with other information (AD[3] or SSF[4] characteristics, rules and legislation, social and economic factors, infrastructures), will be incorporated in a **multi-criteria analysis tool** to optimized the location of a network of AD and SSF sites.

The spatial data are saved in **Shapefile** format, an open and interoperable format recognized as the de-facto standard for all GIS vector data or saved in **GeoTIFF** for raster data. The final sizes of the different datasets remain unknown at this stage of the project but they should be small enough to remain easily manageable.

The project data may be useful from an operational and methodological point of view. In the cities used as case studies, the results may be already exploited as decision tools by local authorities to design new biowaste networks, but those data may also serve as guidelines for the replication of the method in other contexts.

4. FAIR DATA

4.1. Making data findable, including provisions for metadata:

All the data published in the framework of the work package 3.3 of the DECISIVE project and included in the "*Pilot on Open Research Data*" procedure will comply with the **INSPIRE Directive**[5].

Therefore, all data will be provided with a **standard XML metadata**. The metadata will be published on metadata catalog like the *European Union Open Data Portal* to insure their good discoverability.

The metadata will contain in particular:

- Clear information about the content of the data (title, abstract, etc.) to insure a good understanding of its content
- A set of keywords including keywords from officials thesaurus (GEMET[6], etc.) and tailor made keywords to optimize the searching process
- Date of creation and revision, contacts of creators

[3] AD : Anaerobic Digestion

[4] SSF : Solid State Fermentation

[5] http://inspire.ec.europa.eu/

[6] https://www.eionet.europa.eu/gemet/

The metadata will be created manually for each dataset with GIS software (ESRI-ArcGIS or QSphere: a plugin for QGIS Software). In the case of versioning, the version of the data will be clearly expressed in the file name as defined by the file naming schema of the Decisive Project (Deliverable 8.4, ex: *DECISIVE-WP3.3- title-partner_name-Vxx* , where **Vxx** indicates the version number: V01, V02, etc.) but also in the title and the abstract of the metadata.

All dataset will have a **unique resource identifier** (DOI) provided by the repository *Zenodo*[7].

4.2. Making data openly accessible

The final results of the work package 3.3 will be openly accessible in the selected repository (Zenodo). The intermediate data will also be published in the same repository, except if:

- The owners of the data sources or raw data request to keep it close
- The data contain some personal information

Note: The data processing will heavily modify the raw data. Therefore, the final results will show only anonymized information.

Method for data sharing and data repository:

The data and the metadata will be available through Zenodo (www.zenodo.org), a general-purpose open access repository created by OpenAIRE. All data will be published in open and standard formats to allow a good interoperability.

4.3. Making data interoperable

All data and metadata will be published based on open and standard file format:

- GIS vector data are saved in Shapefile format. It is recognized as the standard format for spatial vector data and it is based on open specifications for data operability among most of the GIS software.
- GIS raster data are saved in GeoTIFF format.
- Metadata files are saved in XML

The data vocabulary used in attribute tables will be specific to the theme of the project (waste management, energy, network, etc.). Therefore, a definition of the technical names or concepts will be included in the metadata or in a side document (PDF).

Moreover, to comply with the INSPIRE Directive; some of the keywords used in the metadata will come from official thesaurus like GEMET.

4.4. Increase data re-use (through clarifying licenses)

- Timeframe for data sharing

Data will be shared as soon as the *Communication and Dissemination* and the *Work package 3* leaders have given their agreement. The data will be maintained during the project timeframe and they will remain available after the project on the repository (Zenodo).

- Expected reuse

The project data may be useful from an operational and methodological point of view. In the case studies areas, the results may be already exploited as decision tools by local authorities to design new biowastes networks. But the data may also serve as guidelines for the replication of the method in other contexts.

- Ownership and Licensing

The data will be owned by Irstea and will be published under *Creative Commons license*[8] with at least an attribution (CC **BY**) or attribution and non-commercial (CC **BY-NC**). However, the final

[7] https://www.zenodo.org/

[8] https://creativecommons.org

selection of the license is still under discussion and may be different according to the dataset. In the case of information based on third-party data with a copyleft license, the license will be adapted in consequences.

5. ALLOCATION OF RESOURCES

- Responsible for data management

The data management of the WP3.3 is handled by the GIS service of Irstea. This service is responsible for:

- the data capture or gathering (if others partners are involved)
- the quality control
- the metadata creation or edition
- the storage and backup
- the publication in the selected repository

- Resourcing

To comply with the FAIR requirement[9], the Decisive project will have to cover the cost of data management, storage backup and publication:

Resources	Description	Cost
Human resources	*Format the data, create the metadata, publication in repository, etc.*	20 man-day (estimation)
Storage and backup	*Running cost of Irstea IT services*	Not assessed yet
Repository	*The repository Zenodo is free of charge*	Free of charge

After the end of project, the data will remain available on the repository (Zenodo) without added cost as the services is free of charges.

6. DATA SECURITY

- Data security

No sensitive data will be published.

- Storage and backup

Data and the metadata will be stored in the external repository *Zenodo* which will insure their long term preservation. Moreover, the data will be stored additionally in an own Irstea platform with a secure NetApp® data storage system. The data will be daily saved and replicated to an external data center that guarantees the preservation of long-term data as described in D8.4.

7. SUMMARY OF DMP TECHNICAL CHOICES

Topics	Description
GIS data	Shapefile format for vector data GeoTIFF format for raster data
Metadata	XML format Compliant with INSPIRE Directive
Repository	Zenodo (www.zenodo.org)
Additional backup	Irstea platform

[9] European Commission, Guidline on FAIR Data Management in Horizon 2020 - V3.0, 2016

8. ETHICAL ASPECTS

Until now, no ethical or legal issues were identified.

- No sensitive or personal data will be published.
- If sensitive or personal information is used, from a survey for example, a *Consent Form* will be required as defined by the Deliverable 8.4. Moreover, the spatial analysis will make the data anonymous or impossible to link to any raw data.

9. OTHER

Data will be compliant with the INSPIRE Directive[10].

[10] http://inspire.ec.europa.eu/