Regional reports on actual waste management situation – Fossalto and Ist

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1 General framework of waste management in Croatia

This Deliverable represents the baseline – report for the involved territories, provided in the framework of WP3, in order to have a clear figure of the actual situation on waste collection and management in terms of strengths, weaknesses, opportunities and threats, as a powerful tool for any future plans and interventions.
Existing data collection in targeted territories is carried out through the knowledge of waste management both at national and at local level.
The knowledge of waste management is aimed at getting a starting baseline and obtaining the following essential information:

1) The institutions in charge of waste collection;
2) The treatment plants (management companies, capacity in terms of t/y, location, typology of treatment);
3) Produced and treated waste quantities (overall, i.e. municipal mixed waste and more specifically from organic/food/kitchen, garden and plastic packaging)

2 General framework of waste management in Croatia

Information was taken from the 3 documents:

1) Decision on the adoption of the Waste management plan of the Republic of Croatia for the period 2017-2022 (OG No. 3/17) available at the website : https://www.mzoip.hr/en/waste/strategies-plans-and-programmes.html
2) Waste management in Croatia: Factsheet, available at the website: http://ec.europa.eu/environment/waste/framework/pdf/facsheets%20and%20roadmaps/Factsheet_Croatia.pdf
3) Answers provided by Čistoća to a questionnaire prepared by ENEA (mr. Lorenzo Cafiero) and DRIOPE (mr. Vanja Lipovac)

2.1 Population, surface, waste production and composition

According to a census (2001) shown in [1], general statistical data concerning Croatia are reported in Table 1:

Table 1. - Croatia general statistical data [1

Surface territory	57000 km^2
Inhabitants	4437000
N° households	1477000

The last data about waste production and management go back to 2015 [1]. Municipal waste production amounts to 1653918 tonnes, or 386 kilogrammes per capita. A slight but not meaningful inconsistency by comparing waste per capita production with data reported in Table 1, can be noted, given that these data are referred to different years. Figure 1 describes the annual municipal waste production since 1995 (source: Croatian Agency for the Environment and Nature (hereinafter: CAEN)) from which one can observe that starting from 2008 this datum has stabilised around 1.6 Mt y^{-1}.

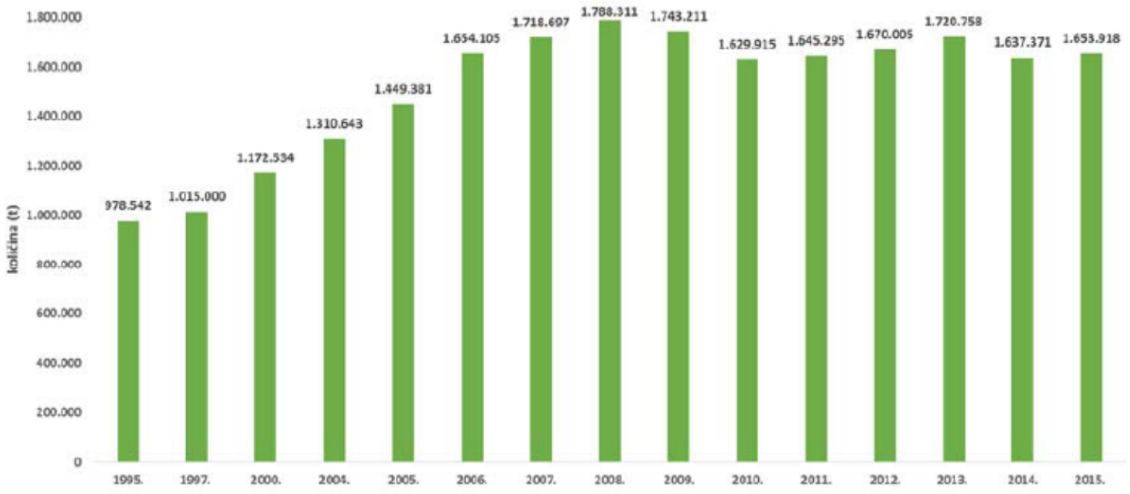

Figure 1 – Yearly municipal waste production since 1995 (source: Croatia Factsheet, [1]-[5])

The waste per capita production is strongly dependent from the province. Touristic territories show higher values than the national average. Zadarska province has a 640 kg in^{-1} and Splitsko-dalamtska, 542 kg in^{-1} as one can see from figure 2.

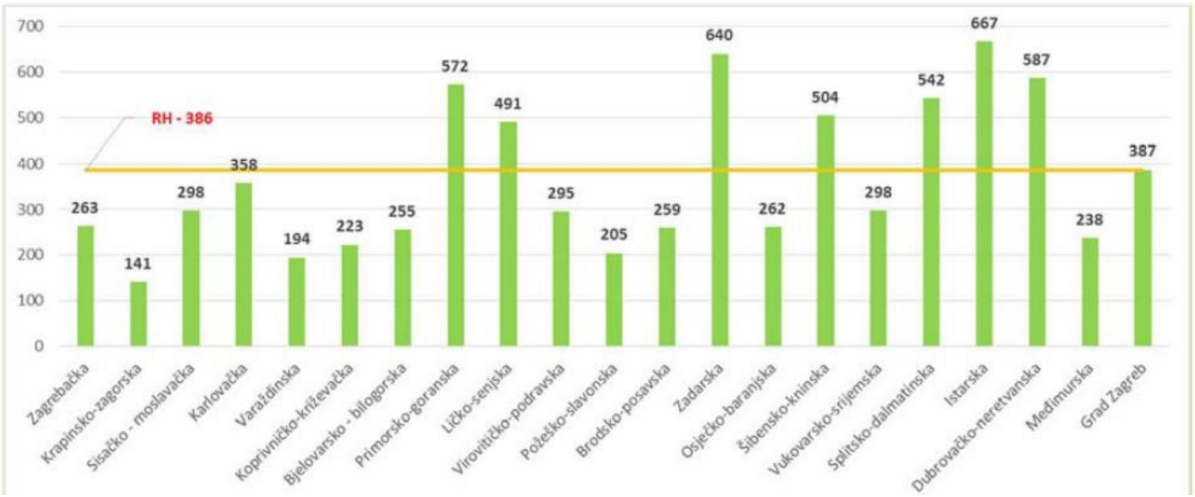

Figure 2 – Municipal waste production per capita referred to the various counties in 2015 (source: Croatia Factsheet, [1]-[5])

The estimated municipal waste composition is reported in Table 2.

Table 2. – Estimated municipal waste composition [1]

Waste category	Percentage (%)
Metals	2.1
Wood	1.0
Textile/clothing	3.7
Paper and cardboard	23.2
Glass	3.7
Plastic	22.9
Gum	0.2
Skin/bones	0.5
Kitchen waste	30.9
Garden waste	5.7
Other waste (soil, dust, sand, undefined)	6.3
Total	100

(source: Croatia Factsheet, [1]-[5])

One can observe that overall biowaste (kitchen, yard) represents the largest fraction followed by paper and plastic which come from packaging.

2.2 Waste collection organisation

According to the Croatian Factsheet [2], municipalities (in legal terms, usually referred to as 'local self government units', hereinafter LSGUs) are responsible for waste collection. This is also confirmed by Čistoća. Waste collection is physically performed by companies owned by the Municipality. These companies are competent to set fees for their services, and also collect them. Fees are usually dependent on the size of waste containers and the frequency of their collection. € 7 per month for a household is a typical fee level for collection and management of municipal waste. In the Ist island which has been foreseen as location for the pilot action, residents are given 80, 120 or 240 containers for municipal mixed waste.

Separate waste collection concerning just municipal waste [1] concerns the following categories: plastics, paper and cardboard, metal and glass. In particular, a very efficient refund scheme concerning PET beverage containers exists since 2006. It applies for volumes > 0.2 l and amounts to 0.5 kuna (= ca. €0.07). A return rate of bottles is given as 94%, with more than 70% of the returned bottles being PET.
According to the Croatian Factsheet [2] there is no legislation covering the introduction of separate collection for biowaste. However, the Croatian waste management plan [1] reported pilot experiences of biowaste separate collection in a few areas of the country which were organised by 96 municipalities or LSGUs.
In table 3 a list of "environmental contribution fees" established for each waste category in the framework of Extended Responsibility Producer (ERP) schemes is reported.

Table 3. – Environmental contribution fees payed by the consumer for each category originating from packaging waste and belonging to ERP schemes (€ t^{-1})

Material		Charge per t (ca.)
PET		€ 54
Aluminium cans		€ 54
Iron cans		€ 30
Paper, cardboard		€ 50
Multi-layered packaging with dominant paper/cardboard component	For beverages:	€ 54
	For other purposes:	€ 99
Plastic bags		€ 198
Wood		€ 20
Textile		€ 20
Other polymer materials		€ 99
Glass		€ 20

Source: Croatian Factsheet [2]

Other ERP schemes are forecast for End of Life Vehicles, WEEE, waste oils, waste tyres, and waste batteries / accumulators, asbestos and C&D Waste. The only category which results to be excluded by ERP schemes is biowaste. This circumstance appears as much remarkable as it represents the largest fraction in the municipal waste composition. This is one of the main reasons why no separate collection for biowaste (apart from some pilot experiences) is established.
While separate waste collection is locally managed by LSGUs, ERP schemes have been set up by a state institution named "Environmental Protection and Energy Efficiency Fund" (hereinafter EPEEF). The EPEEF is responsible for the realisation of all recycling and waste treatment infrastructures in the country.

2.3 Waste treatment

Table 4 reports a list of the main waste treatment options linked to the waste categories.

Table 4. – Waste treatment options

Waste treatment option	Waste category
Landfill	Municipal mixed waste
Recycling (recycling yards distributed in various localities in the country)	Plastic, Paper, metals, glass packaging from separate collection
Mechanical and biological treatment (in waste management centres in various localities)	Municipal mixed waste
Incineration with and without energy recovery	
Composting facilities	Biowaste from separate collection

The fate of the main streams of municipal waste categories is described in Table 5.

Table 5. – Fate of the main municipal waste streams referred to year 2015

Waste categories envoyed to various treatments	Quantities (t)	Percentages (referred to municipal waste production)
WASTE COLLECTION		
Municipal waste production	1653000	100%
Collected municipal mixed waste	1263000	76%
Separately collected municipal waste (paper, glass, plastic, metal)	391000	24%
WASTE TREATMENT		
Landfilling	1318000	80%
Temporary depositing	33000	2%
Material recovery	298000	18%
Energy recovery	288	0.02%

Incineration without energy recovery	56	0.003%
RECOVERY		
Material (metals, plastics, paper, glass, …)	255000	15%
Mechanical biological treatment	8800	0.5%
Anaerobic digestion	5600	0.3%
Composting	27432	1.7%

Elaboration from waste management plan [1]

Examining Table 5, one can see that the practice of landfilling is still the main option for waste treatment. In order to improve the fraction destined to material recovery, biowaste collection and material recovery through composting and anaerobic digestion has to be promoted.

2.3.1 Infrastructures

Given the figures above, an analysis of waste management infrastructures highlights that facilities for composting and waste packaging materials are present in the country.
Regarding composting facilities, a geographical distribution of is reported in the following map (Figure 3). The overall composting infrastructure consists of 11 facilities and it is possible to observe that most of them are located in the north and north east counties, thus far from the Dalmatian archipelagos. The closest one is Perusic plant, 65 km as the crow flies and 155 km through the public road network.

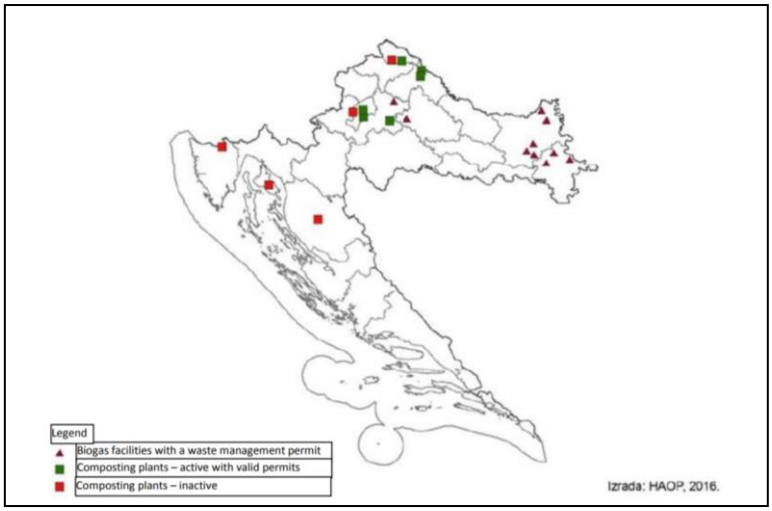

Figure 3 – Composting facilities distribution in Croatia

For what concerns infrastructures for preparation to recycling, named “recycling yard”, they consist of supervised fenced areas intended for separate collection and temporary storage of smaller quantities of special types of waste (e.g. waste paper, metal, glass, plastic, textile, bulky waste, edible oils and fats, detergents, paints, medicine, EE waste, batteries and accumulators, construction waste from smaller household repairs etc.). The country has 84 recycling yards and Zadar possesses three recycling yards. A complete distribution in the geographical area is represented in the map of **Pogreška! Izvor reference nije pronađen.**.

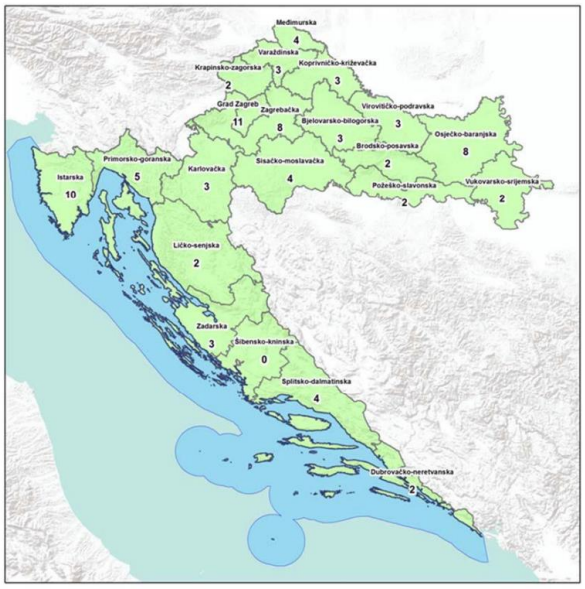

Figure 4 – Recycling yards distribution

3 Existing data of the Croatian targeted territory in Coratia

3.1 Geographical aspects

The pilot experience will be carried out in the Dalmatian island of Ist, in the center-northern area of the archipelago, as one can see from Figure 5.

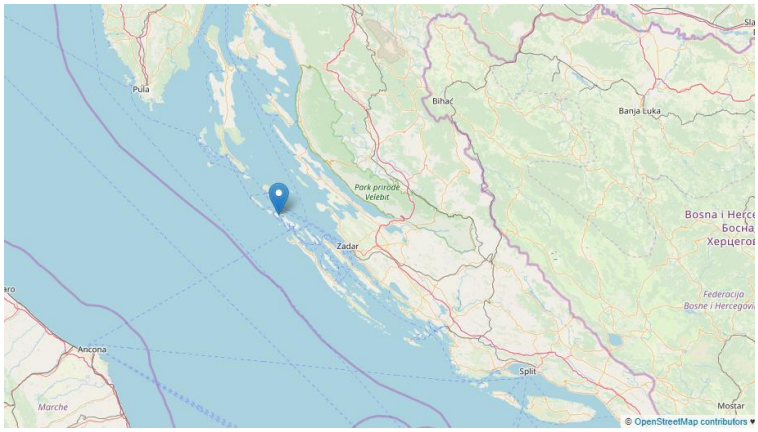

Figure 5 – Position of Ist island in the Dalmatian archipelago

The island has barely 250 inhabitants but its population does sensitively increase on summer because of the tourists number. There are hills, olive groves and vineyards in its interior. Ist is provided with sandy beaches,cisto bays and sandbanks and offers to tourist activities of sports fishing, diving and nautical ones. Anchorage is available in the Mljaka bay where guests are offered accommodation in private holiday houses. Therefore, no large touristic infrastructures (hotels, campsites, restaurants) are present in the island.

Figure 6 – A satellite image of Ist Island where the residential area is shown.

3.2 Stakeholders

Main stakeholders in the island are ČISTOĆA and the harbor authority at Mljaka bay. This last one is a very important touristic infrastructure which is in charge to receive tourists of nautical activities. Accommodation instead, is managed by small bed and breakfasts available in complementary businesses, mostly houses.

As targeted territory for the pilot action, Ist island offers the following benefits:

1) ČISTOĆA manages its own infrastructures;
2) ČISTOĆA organizes a waste collection based on a door-to-door system;
3) a well-equipped harbor for touristic boats is operating.

Moreover, given that the area owned by ČISTOĆA was once a military base, the infrastructure is provided with electric power, water network, and other various services.

3.3 Waste management

Waste management activity consists of waste separate collection and temporary waste deposit. No treatment plants are present in the island. All waste categories are transferred by ship travels to the continent. Waste management is in charge to ČISTOĆA.

3.3.1 Waste collection

Waste collection concerns following waste categories: plastic packaging (EWC 150102), paper and cardboard (EWC 200101) bulky waste (EWC 200307), unsorted waste (EWC 200301). Residents are provided with 80, 120 and 240 L plastic containers and also with dedicated bags for paper and plastic collection, blue one for paper and a yellow bag for plastic. Collection frequency occurs twice on a weekly basis and is carried out by a Čistoća d.o.o. employee. Collected wastes are taken to a deposit station on the island where they are stored in press containers and thus prepared for transport to mainland via a ship concessionaire. Waste is temporarily stored at the transshipping station on the island until the container is filled, and then transported to the mainland. As part of the public service, bulky waste collection is also provided to service users.
A mobile recycling yard is brought to the island once a year for collecting special categories of waste. The transport of mixed municipal waste from the doorstep is carried out with “Piaggio” trucks with a total load capacity of 3.5 t and an average consumption of 7.5 l per 100 km. The average distance travelled by

trucks to the collection points is approximately 10 km. Inhabitants of Ist are also provided with composters for composting biodegradable waste in their own garden. Despite this, it emerged that people prefer to deliver their biowaste to an equipped temporary deposit licensed by Čistoća. In this case, residents are provided with plastic containers of 120 l capacity for waste collection. It also emerged that, as an alternative to composting, often people choose to use kitchen waste as food for animals. This last practice can be considered as analogous to autocomposting and the project can propose a tax reduction also for residents who treat their kitchen waste in this way. This will be the object of a change in the rules for tax collection activity.

The temporary waste deposit (or "reloading station") is equipped with the following containers:

- Retractable container (Rolo) - capacity 30 m^3 (3 pcs)
- Compression container - capacity 20 m^3 (2 pcs)
- Metallic container – capacity 7 m^3 (3 pcs)

The average life of the container is 8 years.

The waste transfer from Ist island to the continent occurs in the following way. For the waste pickup on Ist Island container hookloader "Abrol Kiper" is used with a total load capacity of 26 t and an average consumption of 32 l per 100 km and an automatic container-lifter with a total capacity of 18 t with an average consumption of 26 l per 100 km. The number of planned trips by the ship's concessionaire is 11 times a year, and the distance traveled by the ship on each trip is 65 km.

3.3.2 Waste treatment

All separately collected waste is handed over to authorized collectors, who further submit it for recycling or further treatment, depending on the type of waste that is collected by the collectors. The unsorted (mixed) municipal waste and bulky waste is disposed of at the official "Diklo" landfill in Zadar, where it is disposed of at the landfill body. There is no landfill gas collection system at the landfill, only gas evaporation wells. Recycling facilities for the separately collected fraction lay in the continent, even if not at Diklo or in Zadar territory.

3.3.3 Waste production

Waste production represented by all collected waste categories is reported in the following Table 5. By examining data, one observes that unsorted waste has a very high percentage and no biowaste is separately collected. Given this evidence the strategic aim of the project, which is to try to lower the fraction of unsorted waste by effectively valorising both kitchen and yard waste and reducing the waste ship trips to the mainland, emerge as particularly strategic for the territory.

Table 5. – Waste production in Ist island referred to 2018

Waste category (European waste catalogue number)	**Production referred to 2018 (t/y)**	**Waste category distribution**
Mixed municipal waste (200301)	131	75%
Plastic packaging (150102)	4.28	2%
Bulky waste (200307)	38.66	22%
Paper and cardboard (200101)	1.42	1%
Total	175.36	

3.3.4 Costs

Waste collection is a public service and it is fully public. The state does not participate in the co-financing of the separate collection of waste.

Yearly waste management costs are the following:

- Waste collection cost, which is a variable cost, amount to 26,700 € (200,000 HRK)
- Maintenance costs for waste transport vehicles amount to 4,000 € (30,000 HRK)
- Personnel costs which are attributed to salaries amount to 11,000 € (85,000 HRK).

If we refer the total cost (47,000 €) to the number of residents, we obtain a specific cost of 167 €/inh., which appear very high for such a small island without industrial activities. These costs are mainly due to the waste transport to the mainland and to the excessive amount of mixed waste. This fraction can be lowered by the contribution of small scale composting practices subtracting the biowaste fraction. The specific cost referred to 1 ton of the MSW production is 238 €.

4 General framework of waste management in Italy

Municipal waste production, according to Italian National Agency for Environment Protection amounts to 29.59 Mt in 2017. Detail are reported in the Figure 7 hereinafter.

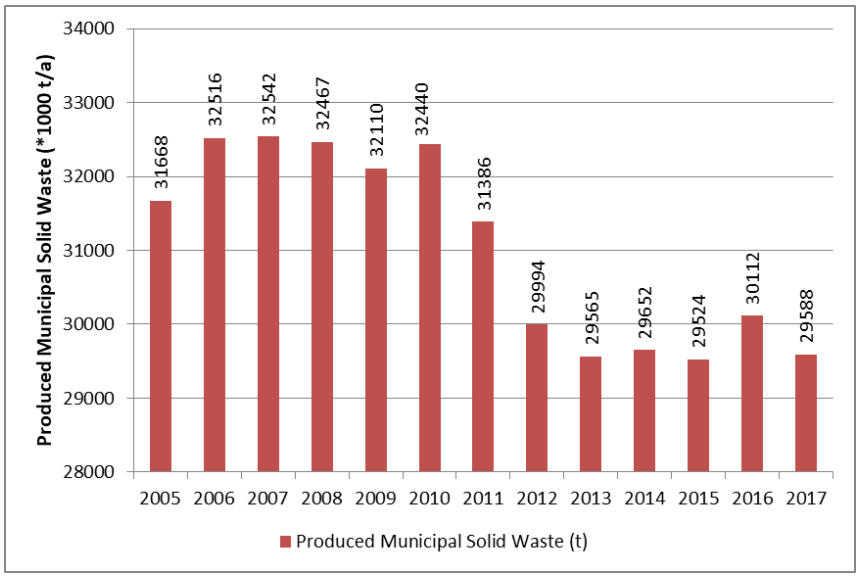

Figure 7 – Municipal solid waste production in Italy in the years 2005-2017

One can observe that Municipal solid waste production in Italy experienced a rapid decrease from 2010-11 to 2012 because of the economical crisis dated back to 2008. The amount of MSW destined to the various management options is represented in Figure 8.

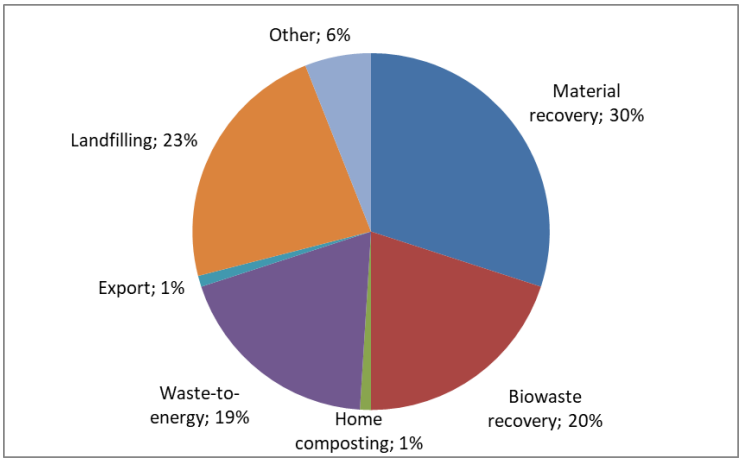

Figure 8 – Fate of the waste among the different waste management options in Italy, 2017

Waste separate collection in Italy achieved 55% overall in 2017. However, the national target foresees a national objective equal to 65% by 2012. Figure 9 shows the detail of waste separate collection by the main waste categories. The collection of the organic fraction performs a satisfactory result because it is estimated to cover at least 80% of the total potential production. Plastics instead, does not manage to achieve 50% with respect to the quantity of input on the market, because of the very strict requirements of the recycling conditions, the strong heterogeneity of the polymeric composition, and waste plastics contamination.

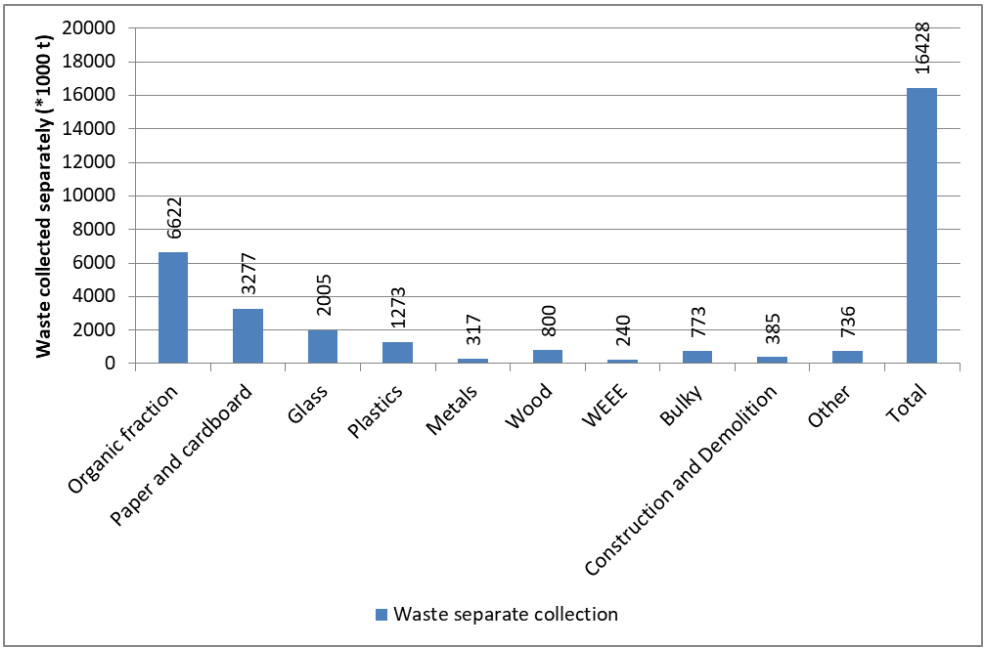

Figure 9 – Separate collection data in Italy, 2017 . "Other" category encompasses a series of waste minor typologies, such as: medicines, fat oils, waste deriving from street sweeping and destined to material recovery facilities, solvents, inks, paints

Packaging waste collection and treatment is organized by packaging producers through the mechanism of the Extended Responsibility Producer principle; mixed and organic waste management is payed by the State. Facilities installed for waste treatment are distributed in the following way:

- Composting: 285 facilities performing an input capacities of 6.12 Mt/y;
- Aerobic-anaerobic digesters: 31 facilities, performing an input capacity of 2.93 Mt/y;
- Waste-to-energy: 49 facilities performing an input capacity of 6.11 Mt/y;
- Mechanical biological treatment facilities: 130 facilities, performing an input capacity of 17.65 Mt/y.

5 Existing data of the Italian targeted territory in Italy

5.1 Geographical aspects

The situation of the Italian targeted territory is being collected through questionnaires. In this section a first group of answers provided by the municipality of Fossalto is reported.

Fossalto is a little hilltop village located at the foot of the mountain chain named “The Appenines” about 50 km far from Adriatic Sea.

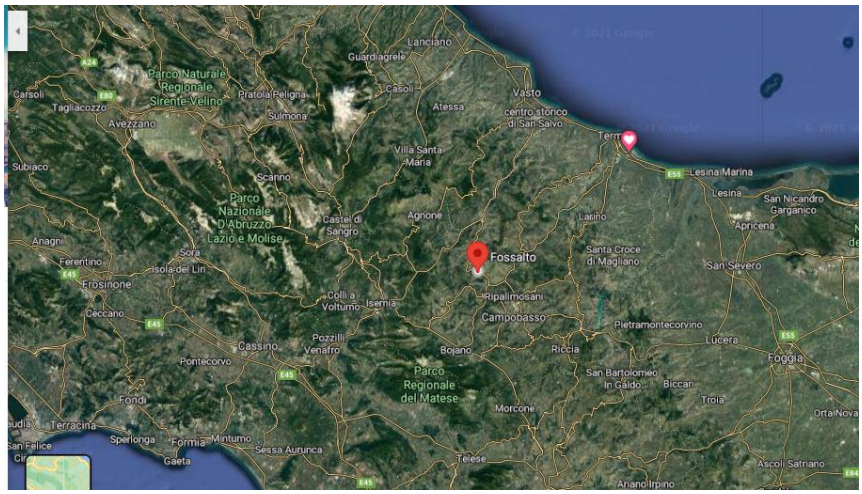

Figure 10 – Position of Fossalto in the Italy map

Fossalto belongs to Campobasso county in Molise region. The municipal territory extends 28 km^2 with a total population of 1258 inhabitants. Fossalto owns an historical center and a 2 km rural district named “Sant’Agnese”. Young people with an age less than 20 years amounts to 155 and the average age of the population is 50 years old (source Italian National Institute of Statistics, 2020..

5.2 Stakeholders

Stakeholders from institutions or industrial activities are not present in Fossalto . In particular, no restaurants, campsites or hotels are settled.

5.2.1 Schools

The village school has classes of pupils up to 13 years old but without catering services.

5.2.2 Restaurants

Commercial activities bound to catering which potentially can be interested to organic waste management are reported in the following table. We can observe that these activities do not resemble the one provided by a restaurant and offer a limited number of seats for their customers.

Table 6 commercial activities bound to catering services settled in Fossalto

Activity	Description	Address
Canella Antonio	Cafeteria	Via Umberto I, 82
Nonno Peppe	sale of take away food	Via Garibaldi, 27
Purple	Pub and sale of take away food	Via Umberto I, 68
Apo	Cafeteria	Strada Provinciale 47

Households which are not settled in an urban context, are located in a rural area. These households use compostable waste partly as feed for pets and courtyard animals partly as feed in a domestic composter.

5.3 Waste management

The waste management is directly organised by the municipal administration and not through a municipal or private company. Separate collection concerns the following waste fractions: organic (EWC 200108), paper and cardboard (EWC 200101), glass (EWC 150107), mixed packaging (EWC 150106), mixed waste (EWC 200301). Biomass from wood cutting and prunings (EWC 200201) is not collected. The involved households in Fossalto historical centre are 187 with 401 residents and in Sant'Agnese district are 57 with

140 residents. Then, the municipal separate collection of organic waste concerns only some households. The rest of households settled in the countryside use compostable waste partly as feed for pets and courtyard animals partly as feed in a domestic composter. Various fractions are transported to the facility of Montagano (CB) in the locality of Colle Santo Ianni; the facility is managed by Giuliani Environment Srl and encompasses the following treatments for 60 municipalities in Molise: composting, mechanical and biological treatment (MBT), landfilling. The composting plant has an input capacity of 14.400 t/y with a biocell technology. The MBT has an input capacity of 55.000 t/y, while the Landfill 39.000 m3/y. Montagano facility is located 30 km far from Fossalto.

In 2019 according to the report of Arpa Molise, the regional environmental protection agency, Fossalto produced a total amount of 278.49 t of urban waste achieving a separate collection rate of 53%. The mixed waste fraction was equal to 128.84 t. Figures of year 2020 were communicated directly by the major of Fossalto. Both figures of years 2019 and 2020 are reported in **Table 7**

Table 7 . – Figures of waste production (t) and waste separate collection (t) in Fossalto in years 2019 and 2020

Year	Organic waste (EWC 200108)	Paper and cardboard (EWC 200101)	Glass (EWC 150107)	Mixed packaging (EWC 150106)	mixed waste (EWC 200301)	Total collected waste	Separate collection rate (%)
2019	45.46	27.1	40.49	36.60	128.84	278.49	53
2020	43.14	17.7	43.68	43.54	133.8	281.86	52

5.3.1 Waste collection organisation

Waste collection occurs by a door-to-door system. The frequency for various fractions and seasonal period, as well as the relative cost is reported in the following **Table 8**.

Table 8 . – Treatment and disposal costs of waste fractions collected in Fossalto

Waste fraction	Collection frequency	Collection season	Treatment and disposal cost (€/kg)
Organic	3 times in a week	July- August	80

	Twice in a week	Jan- June and Sept-jan	
Paper and cardboard	Twice every month	All the year	44
Glass	Twice every month	All the year	25
Mixed packaging	Once every month	All the year	52
Mixed waste	Once every month	All the year	97.96

5.3.2 Waste treatment

The Italian National Agency of Environmental Protection (ISPRA) published figures concerning composting and MBT mass balances of Montagano facility. They are briefly reported in

Table 9 . – Mass balances of composting and MBT facility of Montagano (2019)

Treatment typology	**Input capacity (t/y)**	**input (t in 2019)**			**output (t in 2019)**	
Composting	14400	**Organic waste**	**Yiard waste**	**Sewage waste**	**Soil improver (with sewage)**	**Residues**
		8327	522	1236	1268	1004

Treatment typology	**Input capacity (t/y)**	**input (t in 2019)**	**output (t in 2019)**	
MBT	80.000	**Mixed waste**	**Products**	**Stabilised fraction landfilled**
		23170	4486	18684

As we can observe, the soil improver produced by the composting facility is made up with organic waste from kitchen waste and sewage which for the Italian Law (Decree 75/2010) cannot be higher than 35%. This soil improver from sewage may be sold and distributed as a product.

5.3.3 Waste management costs

The waste transport from Fossalto to Montagano occurs three times every week (in July-August) and twice (for the rest of the year) for the organic fraction and once a week for the remaining waste fractions. Each path costs 10 €. Every transport implies the coverage of two paths: the way from Fossalto to Montagano and back from Montagano to Fossalto. Taking into account these hypothesis, we can report in the following paragraph an estimation of collection costs for each fraction.

Table 10. – Estimation of the waste transportation costs of Fossalto waste collection services

Waste fraction	Collection frequency	Collection season	Weeks considered	N° of trips in a week	Transportation costs (€)
Organic	3 times in a week	July- August	8	6	2240
	Twice in a week	Jan- June and Sept-jan	44	4	
Paper and cardboard	Twice every month	All the year	52	2	1040
Glass	Twice every month	All the year	52	2	1040
Mixed packaging	Once every month	All the year	52	2	1040
Mixed waste	Once every month	All the year	52	2	1040
total					6400

As far as the waste organic fraction is concerned, we can suppose that the introduction of the electromechanical composter can contribute an yearly spare cost of 2240 deduced by the transportation costs.

The treatment costs for Fossalto municipality have been estimated combining data from previous tables

Table 11 . Estimation of yearly treatment costs (€) of Fossalto Municipality

Waste fraction	2019	2020
Organic	3636.8	3451.2
	1192.4	778.8
Paper and cardboard	1012.25	1092
Glass	1903.2	2264.08
Mixed packaging	3636.8	3451.2
Mixed waste	12621.17	13107.05
total	20365.82	20693.13

If we sum the treatment to the collection costs we obtain every year an amount of 27.000 €. We also observe that the disposal cost of mixed waste is the highest; if home composting in rural areas coupled with municipal composting through the use of the electromechanical composter can help to reduce considerably the amount of mixed waste and consequently its disposal cost.

6 SWOT analysis

6.1 Target territory of Ist Island

	Helpful to achieving the objective	Harmful to achieving the objective

Internal origin (attributes of the organization)	Strengths kitchen waste deliverance to animals is part of everyday life in Ist Island. This can be considered a home composting initiative already in operation. Local harbour authority can take over the organic waste delivered by touristic boats and promote a small scale composting initiative.	Weaknesses Landfilling is still the predominant option of waste disposal. Difficulty in the involvement of tourists who stay in a B&B and tend to dispose of their waste not separately.
External origin (attributes of the organization)	Opportunities A small territorial area combined with a very modest population number (ca. 250 residents) makes the territory the ideal site to promote a community spirit and start up the community composting	Threats Waste management in the Island is entrusted to just one employee. In order to guarantee the success of small composting initiatives, it is advisable to enforce the personnel with more two people so that to ensure the continuity of service. Distance of the island from the mainland and reduced accessibility of the island to ensure repair and maintenance operations of the electromechanical composter

6.2 Target territory of Fossalto

	Helpful	Harmful

	to achieving the objective	to achieving the objective
Internal origin (attributes of the organization)	<u>Strengths</u> Fossalto is a village where all citizens know each other and this develops a sense of community. kitchen waste deliverance to animals is part of everyday life in the rural areas A separate collection based on the door-to door system Good level of awareness in public administrators to promote an environmental policy to enhance small scale composting activities giving benefits to the citizenship	<u>Weaknesses</u> Burden some problems and delays connected to the local public administration: i.e., set up of local regulation procedures and permit release times to start up the local composting initiatives. lack of awareness of the population to respond to the initiatives connected to a new waste management policy which implies the resident's involvement. lack of quality of separately collected organic waste excessive percentage of residual mixed waste
External origin (attributes of the organization)	<u>Opportunities</u> Diffusion of rural areas where households own a garden or courtyard where install composters. This variety allows to promote communities to conduct different experiences of composting and different waste typologies management discrete level of scattering of resident population in the territory among: rural, and urban districts. As the population is not concentrated in a unique area, high costs of waste pickup are implied and this favours a local treatment solution as the small scale composting	<u>Threats</u> Small scale composting initiatives might represent a competition against local companies involved in the waste management (composting treatment plant set in Montagano). Business of such companies depend on the waste quantity treated every year.

7 Bibliography

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