

Authors and Editors

Margriet Samwel
Olivia Radu
Ana Kreysing
Domnica Ionescu

The Challenges of Solid Waste Management in Rural Romania

Findings of a survey in four Romanian villages



WECF | Women in Europe for a Common Future

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Autors and Editors:

Margriet Samwel
Olivia Radu
Ana Kreysing
Domnica Ionescu

Layout by Domnica Ionescu

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WECF, Women in Europe for a Common Future

The Netherlands / Germany / France

Email: wecf@wecf.eu

www.wecf.eu

WECF The Netherlands

PO Box 13047
3507-LA Utrecht
The Netherlands
Tel.: +31 - 30 - 23 10 300
Fax: +31 - 30 - 23 40 878

WECF France

BP 100
74103 Annemasse Cedex
France
Tel.: +33 - 450 - 49 97 38
Fax: +33 - 450 - 49 97 38

WECF e.V. Germany

St. Jakobs-Platz 10
D - 80331 Munich
Germany
Tel.: +49 - 89 - 23 23 938 - 0
Fax: +49 - 89 - 23 23 938 - 11

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BIC: SSKMDEMM
Stadtsparkasse München, Munich

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WECF, The Netherlands, France, Germany

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About WECF

WECF is a network of 100 women's and environmental organisations in 40 countries. Our network spans Western Europe and the EECCA region (Eastern Europe, Caucasus and Central Asia). WECF has three offices: in the Netherlands, Germany and France. WECF strives for a Healthy Environment for All. We use women's potential in balancing environment, health and economy. WECF's activities are based on its partners own visions and needs. Therefore WECF implements solutions locally and influences policy internationally.

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1. Introduction

Before the collapse of the communist regime in 1989 there was very little plastic waste in Romania. Food and drinks were sold in glass containers and were recycled, and plastic packaging, tetrapaks and plastic bags were uncommon. These newer plastic containers began to be widely used following the opening of the country, and were not accompanied by any system for recycling or collection. Solid waste management is a hot issue and one, which needs to be addressed urgently. Municipal waste collection and disposal is carried out either directly through specialised departments within the local municipalities, who have overall responsibility, or is outsourced to solid waste services on a contract basis. In general, waste collection services exist and operate mainly in the urban areas. Hence there are only few sanitation services available in rural areas. It is estimated that only 11,4 % of the rural population benefits from solid waste collection services (mainly the rural localities which are in the proximity of cities). In this project region, only 2.5% of the rural population benefits from a waste collection service¹.

Since Romania is a EU member state, the requirements of the Waste Framework Directive (2008/98/EC on Waste) should be fulfilled². Paragraph 1 of the general requirements of the waste directive asks the member states to apply the following waste hierarchy as a priority order in waste prevention, management legislation and policy:

- (a) prevention
- (b) preparing for re-use
- (c) recycling
- (d) other recovery, e.g. energy recovery
- (e) disposal.

When applying this waste hierarchy, Member States shall take measures to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste.

Although waste reuse, recycling or other recovery is a requirement after the EU law, rural people currently do not have their waste collected or recycled.

On 16 July 2009 the Commission called all Member States to remind them of their obligations on solid waste collection and to gather data on compliance. Those found to be in breach of the legislation and might face legal action. Sub-standard landfills are a hazard to public health and the environment. They have the potential to create polluting or toxic emissions and odours, pollution of soil and water, and to contaminate the groundwater. Romania has been given an extended deadline until the 16 July 2017³ with annual increasing targets for the amount of waste disposed in some non-compliant sites.

The combination of ubiquitous plastic packaging and a non-existent recycling or collection system produces an environmental problem, particular in rural communities. The lack of a proper waste management becomes an obvious problem in the countryside: roadsides, hedges, village borders and fields are covered with litter, mainly plastic packaging and animal manure. Local contamination of drinking water wells puts citizens' health at risk through diarrhoea and waterborne diseases, or increases living costs as people are forced to buy bottled water to guarantee at least their children's health whereas often the incomes are too low to afford this for everyone. Landscapes and environment are not only devaluated by plastic waste, but also by indiscriminate disposal of animal manure, dead animals and leftover products of the slaughtering process. Most dangerously, the dumping of animal waste pollutes groundwater and rivers.

Up to now, there has been little or no support from local, regional or national authorities for solving the waste problems in the target villages. Therefore citizens help themselves as best as they can. Hence in springtime and autumn the whole country sides appears to "burn": the houses, fields and the backyards are cleaned up by burning waste such as plastics, rubbish and plant matter.

2. Goal of the survey on inventory and management of waste in Romanian villages

In 2007 WECF and local partner NGOs started a 2-year project called “Safe Sanitation, Health and Dignity, SSHD” in four Romanian villages. The project received financial support by the Fondation Ensemble France and the Dutch Ministry of Foreign Affairs. As the villagers experienced solid waste as a problem, one of the project components was to carry out an inventory about the type of waste found in the four project villages and about how the villagers currently manage their waste. The findings of the inventory could serve as a base for decision-making for further pilot projects in the villages and for raising awareness on waste issues on all levels. Since in general metals are collected by local people, sold and recycled, we did not include this type of waste in the survey.



3. The four target villages

1. Village of Garla Mare, (pop. 3500)
Mehedinti province
2. Village of Vrata (pop. 1500)
Mehedinti province
3. Village of Pietrele (pop. 2300)
Giurgiu province
4. Village of Beiu/Storobaneasa (pop. 3735)
Teleorman province

Garla Mare and Vrata are neighbouring villages in the South-West of Romania in the province Mehedinti, on the border of the Danube. The distance between the villages is only 5 km.

Since 2002 WECF and Romanian partners carried out some pilot projects mainly on water and sanitation in the village of Garla Mare. Urine diverting dry toilets were constructed in a school, the town hall and some households. Vrata joined the project in 2007.

Neither village has a central water supply or sewage system, and both share a high unemployment and poverty rate. Superficially, Garla Mare looks wealthier than Vrata: several public buildings have been renovated or newly constructed. But in Garla Mare a part of the Roma minority suffers severe poverty. In Vrata people cultivate watermelons. In both villages citizen cultivate vegetables, cereals and maize and keep livestock for subsistence use. The two villages bordering on an internationally protected wetland on the Danube riverbank, are mainly valued for their rich bird life. The closest town is Drobeta Turnu Severin, 80 km away; 3 times per day a bus links these two villages with that town.

The village of Pietrele is located approximately 80 km in the south of Bucharest. The village has no central water supply or sewage system. The village creates an impression of being more developed compared to the two villages in Mehedinti. Houses and gardens are better maintained. However the inhabitants of Pietrele also have to deal with a high unemployment rate.

The villages of Beiu and Storobaneasa with 3735 inhabitants, are registered as one community and located 20 km away from the town of Alexandria and 100 km to the southwest of Bucharest. Like in the previous villages no centralised public facilities are installed. The unemployment rate is lower than in the other project villages since the travel to Bucharest is less time consuming than for the other target villages.

All the target villages lack a legal system of waste disposal. The villages rely for their drinking water on individual or public wells and for their sanitation on pit latrines. Garla Mare, Vrata and Beiu/Storobaneasa use for their water coverage groundwater from 8 to 30 meter depth, which is severely polluted with nitrates and microorganisms.

The nitrate limit of the EU directive for drinking water of 50 mg/l is exceeded by more than 8 times. The villagers in Pietrele use groundwater from 60-meter depth for their drinking water, which is apparently better protected against the infiltration of pollutants. The nitrate concentration of all the tested wells just keeps within the limit of 50 mg/l.



Photo 1. The lack of a proper waste management is visible in the countryside (Source WECF)

4. Method of investigation

The citizens of each village were sampled by randomly choosing a house in every neighbourhood. The questionnaire had both fixed answers and possibilities for additional remarks on the subject mentioned (see annex). The interviews were carried out or coordinated by the local NGOs. The answers were translated from Romanian into English and sent to WECF for further investigation and reporting. Most figures are given in percentages of the specific answer given by the respondents, or the findings of the answers are explained in the text. In Garla Mare, Vrata, Beiu/Storobaneasa 40 citizens and in Pietrele 28 citizens were interviewed.

5. Findings

5.1. What types of waste are found in the target villages?

In general remote villages tend to produce less plastic waste than citizens in towns. Self-subsistence families will also have less plastic waste than urban citizens who have to buy all their food in shops.

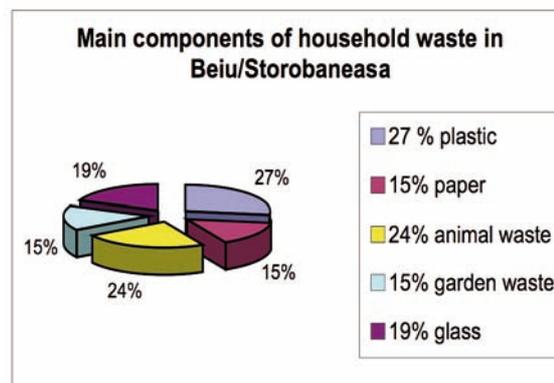
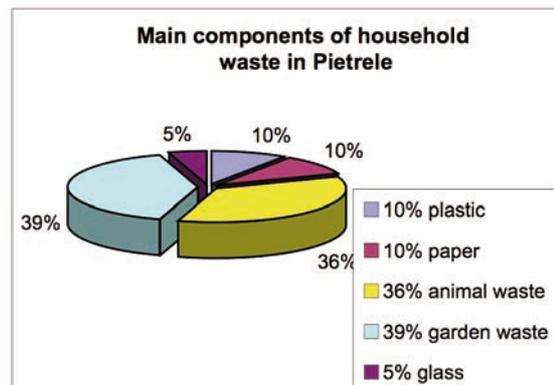
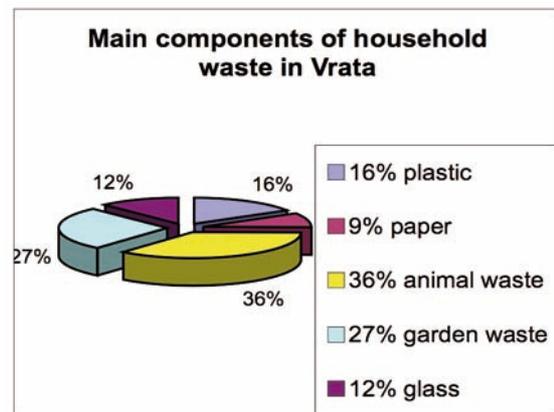
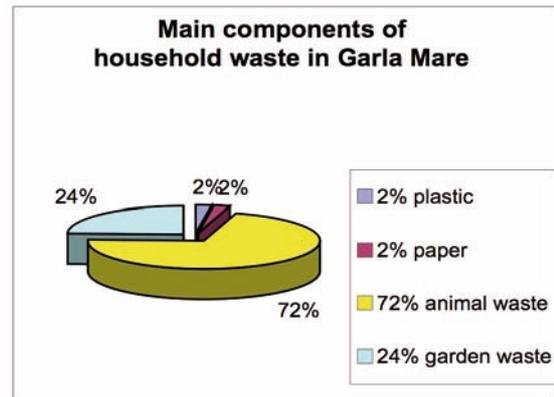


Figure 1. Main components of waste mentioned by the respondents of the 4 target villages

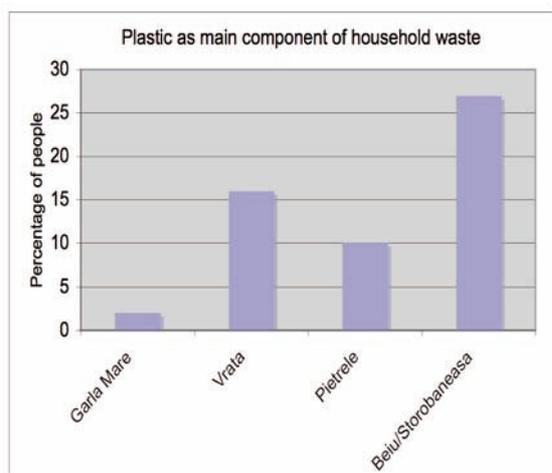


Figure 2. Percentages of people who mentioned plastics as main component of their household waste

Furthermore the economic condition of the consumers, the accessibility of shops and the perception of the quality of drinking water will influence the behaviour of buying packaged products as well. In the four target villages shops for buying groceries and drinks are easily accessible. The questionnaire asked respondents to specify the main components of their household waste. In Beiu/ Storobaneasa 27% of the respondents mentioned plastics as the main component of their solid waste, in Vrata 11%, in Pietrele 4% and in Garla Mare only 1% mentioned plastics as the main component of their waste (fig. 1 and 2).

To obtain a better insight into the amount of plastic waste in the villages, the interviewed citizens were asked how many plastic bottles they buy weekly. In Pietrele half of the interviewed people did not buy any bottles. This low use of plastic bottles could be related to the relatively good quality of drinking water in Pietrele, which the other 3 target villages are lacking. In Beiu/Storobaneasa 7 out of the 40 interviewed people did not buy any bottles. However in Beiu/Storobaneasa families were found who bought more than 20 bottles per week. In Vrata and Garla Mare every respondent bought plastic bottles; more than 50% bought 1-5 bottles a week, 25% bought 11-15 bottles (table 1).

No. of bottles	0	1-5	6-10	11-15	>20
Garla Mare (38 respondents)	0	23	10	5	0
Vrata (26 respondents)	0	20	5	1	0
Pietrele (21 respondents)	15	6	0	0	0
Beiu/Storobaneasa (40 respondents)	7	24	5	1	3

Table 1. Overview of the respondents and the weekly bought number of plastic bottles

Moreover, 80% of the interviewed villagers of Garla Mare said, that animal waste is the main component of their waste. In Vrata this was true for 60% of the villagers, in Pietrele for 53% and in Beiu/ Storobaneasa for 35%. In Beiu/ Storobaneasa the least amount of animal waste is produced, which is correlating with the fact that 8 people mentioned not to have any husbandry; in Garla Mare everyone had livestock, in Vrata only one person didn't. In Garla Mare all respondents have poultry and like in Vrata more than 50% of the respondents mentioned to have pigs (fig. 5).

5.2. Who is responsible for waste disposal?

Since Romania is a member state of the EU, the regulations of the EU have to be fulfilled. The basis for environmental care and the waste management legislation, is law no. 137 of 1995. According to article 24, the local administrative authorities, the natural and legal persons whose scope of activity includes activities covered by the regulations stated in article 22, have the following obligations⁴:

- Request an environmental agreement or permit
- Storing domestic, industrial, agricultural and other waste only on surfaces authorized for such purposes
- Siting and constructing waste storages according to the prerogatives granted by law
- Recovering reusable waste and turning them to account through specialized units
- Using only certified waste on farming lands. Competent environmental protection, health and agricultural authorities should do the certification

The questionnaire asked the villagers who they thought was responsible for safe waste management in the community. In Pietrele, Beiu/Storobaneasa and Vrata most of the respondents were aware that the local administration is responsible for safe waste management in the community; in Garla Mare only 4 out of the 40 interviewed people gave the correct answer.

5.3. What are the villagers doing with the waste?

In 2005 an investigation on finding an affordable approach for managing the solid waste in the village was carried out in Garla Mare⁵. The waste in Garla Mare is first stored in the courtyards. After some time the men bring the waste to one of the (unauthorised) rubbish dumps. Transport is hard. People carry bags of waste on their back, in a wheelbarrow or use a horse carriage. Because of these hard transport conditions citizens dump their waste just outside the village. The border of the village is full of small rubbish dumps (fig. 3). Since the dumps are used every day, they 'move' over time and the paths outside the village change their course, if necessary. Many of the circumstances identified in 2005, are relevant for the other 3 target villages of this survey.

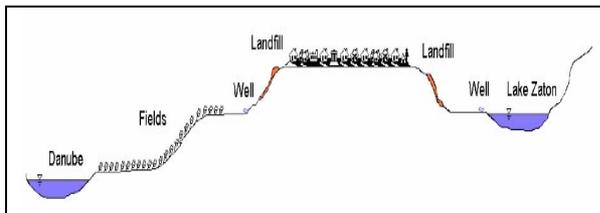


Figure 3. Picturing the circle of waste around Garla Mare.

The results of this survey showed the same picture. Most of the people are dumping their waste somewhere on a landfill. Although none of the target villages have an authorised landfill, between 30%-50% of the respondents think that the used landfill is indeed authorised.

Besides the disposal on unauthorised landfills, between 5%-25% of the respondents dispose their waste on fields. Visiting the borders of lakes and small tributaries flowing to the Danube around

Garla Mare shows that the borders are partly used as animal manure-dumping places. Almost 20% of the respondents from Garla Mare mentioned they dispose waste along water borders. Surprisingly the villagers of Vrata, who are also living nearby water borders, do not have this habit. An explanation could be that the citizens of Vrata use the nearby waters also for bathing; the villagers of Garla Mare use the Danube and not the nearby tributaries of the Danube or lakes to go swimming.



Photo 2. Water borders are partly used as animal manure dumping places (Source WEFCF)

In Pietrele none of the villagers dump their animal waste at a water border; only 3 out of 40 interviewed people from Beiu/Storobaneasa do so. In Pietrele the landscape is very stony and a water border is less easy to reach than in the other investigated villages.

Incinerating of household wastes

Given that there is no waste collection system in the village it is very challenging for the villagers to keep their homestead free of waste. Therefore besides disposing waste in the environment, many of the rural citizens burn their waste. It can be done in the yard, somewhere outside the house or in the stove. Since there is no gas network in the target villages available for heating or cooking, all the villagers have a stove, which is mainly heated with wood. For removing waste and producing some energy, it could be attractive to burn waste in the stoves or yards.

The respondents were asked if they burn waste and if yes, what kind of wastes. In Garla Mare 97% of the respondents burn wastes, 80% of them burn plastics, and it happens outside their houses. Only one respondent burned inside the yard and in the stove. In Vrata 90%, in Pietrele almost 50% and in Beiu/Storobaneasa 55% burn their waste (fig. 4). About 40% to 50% of the respondents burn plastic waste. In Beiu/Storobaneasa almost 20% of the respondents burn plastics in their stoves, in Pietrele none and in Garla Mare two and Vrata one respondents did so. In Garla Mare all respondents knew that burning plastics could affect their health. In the other target villages 20% to 30% said it does not affect the health or did not know. Besides plastics, garden waste and paper waste is burned in all the target villages.

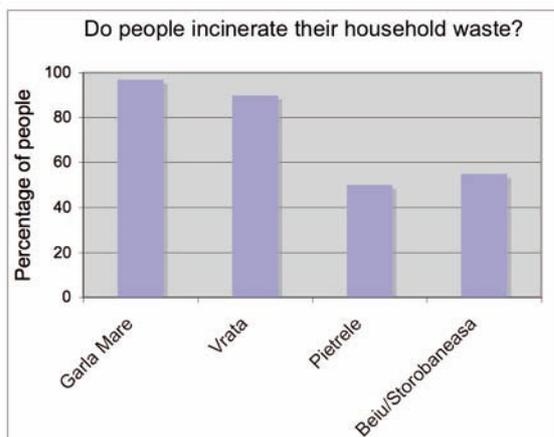


Figure 4. Percentage of respondents who are burning their household waste

5.4. How is animal manure managed?

Having one or more pigs or poultry in the backyard is a tradition for many Romanian families, although having husbandry means also feeding the animals with a lot of corn before it can be slaughtered, entailing considerable financial outlay. Often the animal food is all or partly produced by the family. However the size of the household yards or fields does not always match the comparatively big amount of manure available for fertilising purposes. Often the transport of the manure is a barrier for its usage in the fields. Further in some areas the pig manure is considered not to be beneficial for the agriculture. Hence mostly a very poor management of animal manure and in particular pig manure is practised.

The citizens were asked what they do with the several types of manure.

Pig manure

In Garla Mare and Vrata 65% of the interviewed villagers have one or more pigs (fig. 5); however more than half of the pig owners waste the pig manure. In Vrata only 40% and in Garla Mare 53% of the interviewed pig owners use the dung as a fertilizer (fig. 6); the other pig owners waste the pig dung.

The interview showed that in Beiu/Storobaneasa and Pietrele fewer pigs are kept than in the two other villages. In Pietrele 90% of the interviewed pig-owners use the pig manure for fertilizing purposes.

In Beiu/Storobaneasa all the pig owners use a part of the pig manure for fertilizing, but all the pig owners said also they waste a part of the pig dung.

Cow and horse manure

In Vrata, Garla Mare and Pietrele 20% to 30% of the interviewed citizens have at least one cow; in addition 30% to 40% of them have a horse or donkey (fig. 5). Cow and horse dung are locally considered to have much more value than pig dung. Except in Beiu/Storobaneasa all the cow and horse/donkey owners use cow and horse manure as fertilizer in their gardens or fields. In Garla Mare and Pietrele none of the animal owners wasted cow or horse dung but use the dung for fertilizing; in Beiu/Storobaneasa respectively 75% of the cow owners did so (fig. 6).



Photo 3. In Garla Mare and Pietrele none of the animal owners wasted cow or horse dung but use the dung for fertilizing (Photo WECF)

Poultry (chicken and goose) manure

Chicken and geese are kept frequently in the target villages. 60%-100% of the interviewed peoples have some poultry (fig. 5).

In Beiu/Storobaneasa the fewest and in Garla Mare the most poultry owners were found. In Vrata and Pietrele more than 90% of the respondents use poultry manure for fertilising, however in Beiu/Storobaneasa half of the poultry and all the pig owner said they waste that manure.



Photo 4. Keeping pigs or poultry in the backyard is for many families in Romania a tradition (Source WECF)

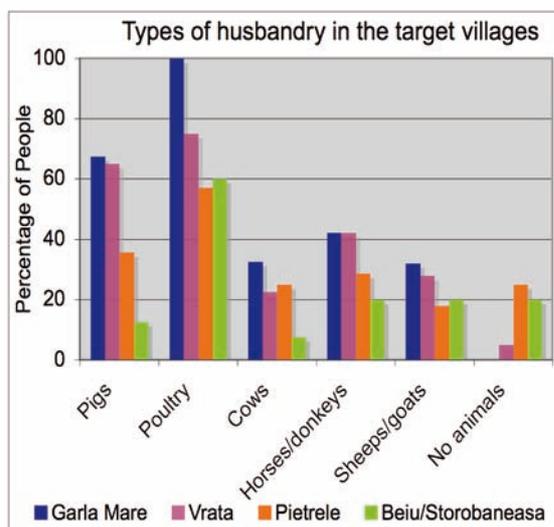


Figure 5. Percentage of people in the target villages having the different types of husbandry

Sheep and goat manure

Keeping sheep and goats is equally popular as having cows and horses in the target villages. 20%-30% of the interviewed villagers have those animals. In this survey the sheep owners were not asked what they are doing with that dung.

Do the villagers want an animal manure collection system and manure platform?

As mentioned above the villagers face great challenges in dealing with their animal waste.

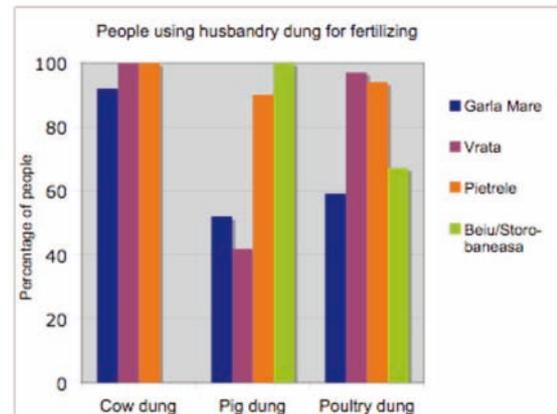


Figure 6. Percentage of cow, pig and poultry owner who use the dung for fertilizing the fields

WECF asked them if they would like to have an appropriate manure collection system and a platform for the manure in their village. The respondents in Garla Mare (87%), in Vrata (80%) and in Beiu/Storobaneasa (65%) were highly interested in having such a system. In Garla Mare nobody answered the question with no. In Vrata and Beiu/Storobaneasa 4 respectively 6 persons out of the 40 interviewed answered with no.

The interest in a manure collection system in Pietrele is much smaller than in the 3 other target villages. More than 70% of the people would not like to have a manure collection system in their village. Taking the high rate of using the manure, including pig manure for fertilising the fields in Pietrele, the low interest in a manure collection system among the citizens is clear. Apparently the villagers of Pietrele manage the animal manure themselves.

The citizens of Garla Mare and Vrata don't have the habit of using pig dung. Moreover all the pig owners in Beiu/Storobaneasa waste a part of the available pig dung. In this survey the reason for this habit was not asked, but it could be that the size of the available fields is not large enough for taking all the produced animal manure up or too much labour is required to bring the manure to the fields, that are often far away from the houses and dispersed. Furthermore, pig manure is not regarded as a good fertilizer in Garla

Mare – the citizen consider it too 'sour', spoiling the soil and burning the plants.

5.5. How is garden waste managed?

All the citizens of the target villages have a garden. On the question "What are you doing with your garden waste?" the possibilities of incinerating, fertilizing, leaving the leftover on the fields or wasting them, were given. The percentages of people burning their garden waste were: 87% in Garla Mare, 58% in Vrata, 25% in Beiu/Storobaneasa and only 13% in Pietrele. In Pietrele 78% use their garden leftover for fertilising the fields or leave it on the fields (fig. 7).

Although in Romania more than 50% of the inhabitants live in rural areas, the habit of composting organic waste is not widespread in the new EU member state.

In this survey a question about the habit of composting was included. In some villages it was noticed that the citizens did not know what composting was, and the interviewers had to explain the theme.

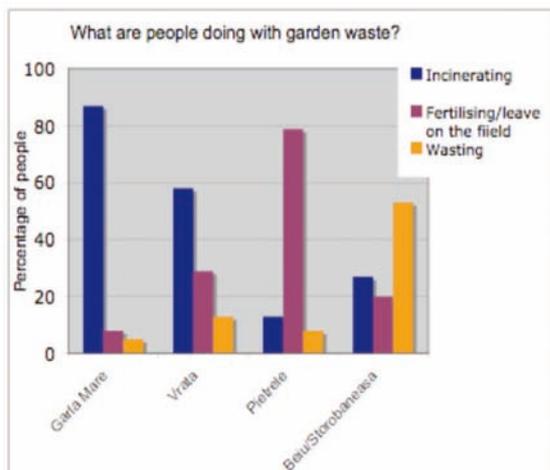


Figure 7. Percentage of people related to the type of garden waste management

Respondents in Garla Mare were less familiar with composting practices: only 1 out of the 40 respondents does it. In Beiu/Storobaneasa half of the respondents do compost, which marks the highest distribution of this habit among the target villages. In Vrata 7 out of 40 respondents compost organic waste and in Pietrele 30% of the respondents do composting.



Photo 5. Incinerating organic waste in one of the target villages (Source WECF)

5.6. How is hazardous waste managed?

Questions about the habits of the citizens related to waste consisting of pesticides, oil and medicines were in the survey concluded.

Pesticide packages and leftovers

Pesticides for agriculture gardening are quite usual in the countryside. A lot of the groundwater is polluted with those substances and the users are not always aware of their environmental toxicity. Moreover in Romania little is done to inform about handling empty packages or pesticide leftovers. The questionnaire asked the people: "What is done with the empty pesticide packages and pesticide leftovers?" In Garla Mare almost 40% of the respondents mentioned they reuse pesticide leftovers or they don't have those; 15% of the respondents said they incinerate the packages and leftover. In Vrata almost 40% and in Beiu/Storobaneasa 23% of the respondents incinerate pesticide packages and left over; in both villages 15% of the answering people said to waste the pesticide packages/left over. In Pietrele 95% of the respondents answered not to have pesticide leftover; in Beiu/Storobaneasa and Vrata about half of the respondents do so as well (fig. 8).

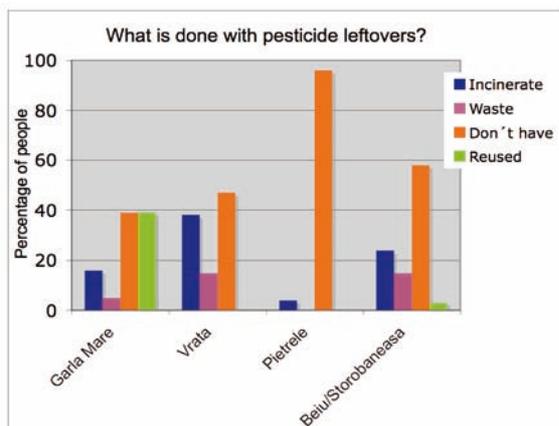


Figure 8. Overview of what the respondents are doing with pesticide leftovers

Oil waste

Leftover oil can be hazardous for the environment, in particular in communities where no special collection possibility is organised, like it is in the four target villages. The survey did not differentiate leftover oil from the kitchen and motor oil from tractors or cars.

The survey posed the question "What do you do with leftovers of oil?"

In Beiu/Storobaneasa almost half of the respondents said to have waste the leftover of oil. Many of the interviewed citizens said they do not have leftovers: in Pietrele 75% of the respondent said so. In Vrata 25% and in Garla Mare almost 40% of the respondents use the leftover as food for pigs. Another option for getting rid of the leftovers was for the respondents in Vrata and Beiu/Storobaneasa (resp. 20% and 15%) the incineration of oil.

Surprisingly in Garla Mare 35% of the interviewed citizens use the leftovers of oil for making soap. In Vrata only one person mentioned this option. In Pietrele and in Beiu/Storobaneasa no soap-makers were identified.

Leftovers of medicines/pharmaceuticals

In Garla Mare and in Beiu/Storobaneasa more than half of the respondents, in Vrata 25%, mentioned to waste the leftovers of their medicines, whereas 35% of the respondents in Vrata and 75% in Pietrele mentioned not to have leftovers. Incineration was for approximately 30% of the respondents the solution to remove leftovers of medicines. The only exception being Pietrele, where 7% burned left over medicines.

5.7. Interest in an appropriate waste collection system and willingness or affordability to pay

The citizens of the 4 villages were asked if they would like to have an appropriate waste collection system in the village and if they are willing or able to pay for it.

All the respondents in Garla Mare and except one person in Vrata answered that they would like to have a waste collection system. 45% respective 70% were willing to pay a small amount for a waste collection system. In Pietrele the respondents were reluctant, most of them don't know if they want or don't want a waste collection. The willingness for paying is very low, only one of the respondents answered yes; the others still don't know.

In Beiu/Storobaneasa 75% liked having a waste collection, although 30% were not willing to pay for the service (fig. 9).



Photo 6. Would the villagers like to have an appropriate waste collection system in the village and are they willing or able to pay for it? (Source FVC)

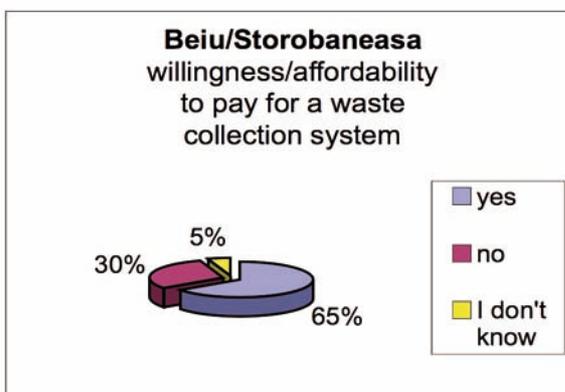
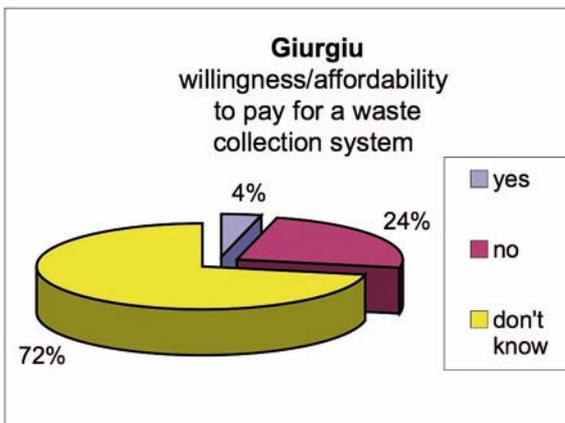
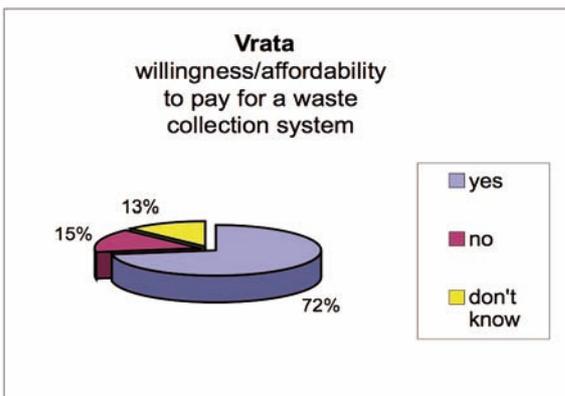
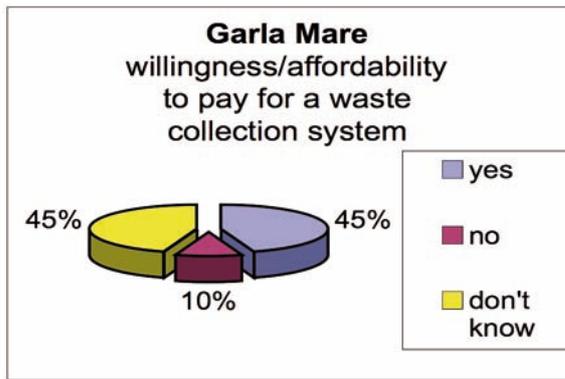


Figure 9. Overview of people's willingness or affordability to pay for a waste collection system

6. Summary and conclusion

General

- In all the four target villages there is no waste collection system and citizens themselves have to find solutions to manage their waste
- Although waste is a visible problem in the villages a quarter or more citizens are not willing or able to pay for a waste collection system
- In the four target villages burning of recyclable resources such as organic waste, paper and plastics is widely practised
- There are differences of habits in producing and disposing waste among the target villages

Garla Mare (county Mehedinti)

- From the four investigated villages the most livestock is kept in Garla Mare, such as chicken, pigs, cows, sheep, horses or donkeys
- The citizens of Garla Mare in particular waste their pig manure and plastics; not only on illegal dumping places, but also along the water borders
- Burning of organic waste is widely practised
- All the respondents are aware about the health risks caused by burning plastics
- All the citizens would like to have a waste collection system
- 3 out of 40 respondent don't want to have an animal waste collection system
- Composting is not practised
- The citizens of Garla Mare are champions in recycling oil by making soap of the oil leftover

Vrata (county Mehedinti)

In general the inhabitants of Vrata face the same problems as those of Garla Mare, but even though they are neighbours the two villages differ in some aspects

- In Vrata people have fewer poultry, cows and sheep, but more goats than in Garla Mare
- The citizens of Vrata waste less plastic bottles and less animal manure
- They incinerate less garden waste than their neighbour village and compost more

- Only one respondent mentioned making soap of oil leftovers
- The citizens of Vrata are most likely to incinerate their hazardous waste such as medicines, pesticides or oil

Beiu/Storobaneasa (county Teleorman)

From the four target villages the citizens of this village are the best connected with Bucharest, the capital of Romania

- They have the most plastic bottles, plastic and glass waste of all the target villages
- The villagers of Beiu/Storobaneasa have the fewest livestock such as pigs, cows and sheep. But, at least only a third part of the animal manure is wasted or incinerated
- The citizens of Beiu/Storobaneasa are most likely to incinerate waste in their stoves and to compost garden waste

Pietrele (county Giurgiu)

- From the 4 target villages the inhabitants of Pietrele have the fewest waste of plastics and hazardous waste
- The most respondents without livestock were found in Pietrele
- In Pietrele the fewest interest in having a waste collection system and in having a manure collection system was stated
- The citizens of Pietrele are most likely to use manure of their livestock, including pig manure

7. Recommendations

National, regional and local level

- In order to stop the ongoing deterioration of the Romanian landscapes and environment, an affordable and sustainable waste management system should be developed and implemented as soon as possible for the villages
- Civil society and citizen organisations should play a crucial role in developing an affordable and sustainable waste management system. Public participation must be guaranteed and a transparent financing system should be developed
- Access to financial and technical support for the local administration should be increased for the villages

Organic waste

- Organic waste, paper and plastic should be collected separately and recycled locally where possible or regionally
- The administration for environment and agriculture should raise awareness among the villagers on the value of organic leftovers and support the citizens in developing appropriate organic waste management systems in particular for animal manure and autumn leaves

Plastics and hazardous waste

- In order to stop the mismanagement of resources, a recycling and/or reimbursement system for plastics should be made available. Furthermore strategies for avoiding plastics should be promoted
- A compressing machine that reduces the volume of plastic waste (bottles) should be installed in each village or region. The plastic should be transported to the nearest recycling fabric by the municipality
- The producers and/or the traders of pesticides and other hazardous waste should introduce a return system for packages and hazardous leftovers
- Raising awareness and the management of hazardous waste, including dead animals and slaughter leftovers should be started and implemented as soon as possible.

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Annex

Questionnaire for solid waste management in the village

Number of interview: Name of interviewer:
Date of interview: Name of village:

Profile of respondent's household:

Name (optional)	M/F	Age	Size of household	Age of children living in the household

1. Solid Waste

- 1.1 What is the main component of your household waste (glass, plastic, paper, animal waste, other)?
- 1.2 How is solid (household) waste disposed off?
- 1.3. Where is the waste or garbage ultimately disposed off?
- 1.4. If the garbage is disposed at unauthorised places, are you interested in having an appropriate waste collection system in your village?
- 1.5. If yes, are you willing and able to pay a small amount of money for proper waste collection?
- 1.6. How much plastic waste do you have weekly?
- 1.7. Are you burning any waste?
- 1.8. If yes, what kind of waste do you burn (paper, plastic waste, like bottles or bags, other)?
- 1.9. If yes, where do you burn it (outside the house, in the oven, or else?)
- 1.10 Do you think that burning plastic can affect your or your children's health?

2. Animal manure

- 2.1. Which animals do you have and how many of the several species
If you have:
- 2.2. What do you do with the pig manure
- 2.3. What do you do with the cow dung
- 2.4. What do you do with the horse dung
- 2.5. What do you do with the chicken/goose manure
- 2.6. Do you do any composting? And if yes, how?
- 2.7. Would you like to have an appropriate manure/dung collection in your village?

3. Garden waste

- 3.1. What is the size of your yard
- 3.2. What do you do with garden waste?
- 3.3. Are you burning any garden waste?
- 3.4. If yes, which garden waste do you burn?
- 3.5. Do you do any composting of garden waste?
- 3.6. Would you be interested in composting animal manure, garden waste and/or vegetable and fruit leftovers (in order to have good compost for your field or garden)?

4. Other waste

- 4.5. What do you do which left-over of pesticides
- 4.6. What do you do which left-over of oil
- 4.7. What do you do which left-over of medicines
- 4.8. What do you do which left-over of paint

5. Any comments by the interviewer:

WECF The Netherlands

PO Box 13047
3507 LA, Utrecht
The Netherlands
Phone: +31 - 30 - 23 10 300
Fax: +31 - 30 - 23 40 878

WECF France

BP 100
74103 Annemasse Cedex
France
Phone/Fax: +33 - 450 - 49 97 38

WECF Germany

Sankt-Jakobs-Platz 10
D - 80331 München
Germany
Phone: +49 - 89 - 23 23 938 - 0
Fax: +49 - 89 - 23 23 938 - 11

E-mail: wecf@wecf.eu
Website: www.wecf.eu



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