

Georgia: Status of solid waste and excreta management in Khorga and Chaladidi



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and nutrient management in rural Georgian communities"*



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Survey report

Georgia: Status of solid waste and excreta management in Khorga and Chaladidi

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Summary

The survey on the status of solid waste excreta management was prepared within the framework of the project Managing Wastewater through Global Partnership - Reducing the Pollution of the Black Sea by introducing sustainable wastewater and nutrient management in rural Georgian communities implemented by WECF –Women in Europe for a Common Future and Georgian partner Rural Communities Development Agency (RCDA).

The project is funded by the United Nations Environment Programme (UNEP). See for more information <http://www.wecf.eu/english/about-wecf/issues-projects/projects/managing-wastewater.php>

The objective of the survey was to assess and identify the amount of the solid waste and excreta generated a by the households and problems impeding the effective and efficient solid waste management in Khorga and Chaladidi. The survey had also set an objective to assess the attitudes and perceptions of local people about sanitation issues contributing to solid waste management problems, and finally to public awareness on the importance of solid waste management for the well being of rural population. Out of the 677 households 85 men and women were interviewed, covering 15% of the total number of households.

Out of the 85 interviewed households 80 (94%) households in the two assessed villages have in ownership some animals. Number of responding households in the two assessed villages that own cows comprised of 79 (93%), on average one household own 3 cows, 1,4 pigs, one horse and some poultry. Livestock is kept during daytime mainly outside and during nighttime in a stable or shed.

96% of the households reported they use the solid animal waste for fertilizing the fields. This however, is done without prior proper storage and composting operations. The liquid manure is not collected and infiltrated in soil.

93% of the households have pit latrines, 7% have a flush toilet, with a septic tank located nearby the house. The assessment also revealed that 93% of the households do not have appropriate wastewater disposal systems. 80% of the surveyed households bury the fecal sludge in their yard; 20% dispose the toilet waste in the field

20 -30% of the respondents mentioned the left overs of the crop production, of plastic - and garden waste are disposed on the riverbank; 70% mentioned the plastic waste is either burned in a stove or on the field.

Only 2% of the surveyed households compost animal waste, kitchen and garden waste. All respondents mentioned not to know if they are interested in a communal composting system, while they know nothing about such communal composting system. 29% of the respondents think there is a market for selling compost, 71% do not know if there is a market.

The respondents consider human and animal excreta as the most problematic waste component.

Based on the results of the survey a rough estimation was made of the yearly amount of excreted nitrogen originated from the main sources (inhabitants, cows and pigs). The yearly amount of nitrogen originated from the habitants of the villages Chaladidi and Khorga is almost 9000 kg and is buried and infiltrated in soil; the yearly amount of nitrogen accumulated by the cows in both villages is 45,000 kg, of which the solid manure is collected on a heap or spread directly in garden and grassland and the liquid manure (stable) infiltrates in soil. The estimated yearly amount of nitrogen excreted by pigs is 7,700 kg and spread directly on garden, whereas the liquid manure is infiltrated in soil.



Map of Georgia with indication of the target region

1. Introduction

Waste is introduced into the environment due to the day-to-day activities of humans. Waste management refers to the many methods and processes of dealing with waste at every stage from generation and collection through to final disposal. Environmentally sound waste management must go beyond the mere safe disposal or collecting of wastes that are generated and seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption.

Organic wastes can represent a large proportion of the solid waste stream in any rural community. Furthermore, farm households generate large amounts of manure that can pose a threat to the environment, especially watercourses, if not well managed because of nutrient overloading.

Solid waste has become one of the biggest problems and its management is one of the major issues nowadays for our environment. The problem is not restricted to a single place rather it covers all parts of the environment which leads to overall pollution. The most obvious environmental damage caused by solid waste is aesthetic. A more serious risk is the transfer of pollution to ground water and land as well as the pollution of air from improper burning of waste. Leachate from unlined and uncovered dump sites contaminates surface and ground waters. On the other hand, lack of knowledge on the unfavorable health outcomes of solid wastes increases the occurrence of infectious diseases.



Picture 1. Plastic and other waste burnt in the field



Picture 2. Animal manure disposed in the open

2. Method

The study was conducted at the end of June beginning of July 2014 in two communities Khorga and Chaladidi. The project site is located in Khobi Municipality of Samegerelo Zemo-Svaneti region; both villages are located alongside river Khobi that flows into the Black Sea.

The population of Khorga is 1320 (358 households), and population of Chaladidi is 1245 (319 households).

As in Khorga and Chaladidi and generally in rural areas of Georgia the households generate substantial amounts of solid wastes with considerable indiscipline, the assessment placed emphasis on domestic waste. A questionnaire was elaborated and administered by WECF (see annex) and was translated into Georgian by RCDA. The questionnaire included questions about number and types of animals kept by the households; types of used sanitary facilities, the overall incidental waste flows and practices of its management.

Before the commencement of the actual data collection, the Investigator trained 7 interviewers/enumerators from different settlements in Khorga and Chaladidi for one day and the questionnaire was pre-tested.

The criteria for choosing the households were developed by the project team in cooperation with local initiative groups. The criteria included:

- (i) Willingness to participate in the survey;
- (ii) Economic status -that is generally representative of the area in terms of dwelling condition, size of farming area, organization of the household premises, and water supply;
- (iii) Location - preference was given to the households living nearby the riverbank.

General rules of surveying households included:

1. Households should not be next to each another;
2. Households should not be excluded if respondents are not immediately present but an appointment can be scheduled to interview them later in the same day

In the two target villages, data was collected from 85 households covering 13% of the total number of 677 households, through interviews and observation by trained data collectors from the project site. The investigator supervised the data collection process to ensure the completeness of the

questionnaire. The respondents of the interview were the household heads or spouses. Preference was given to the wife when both were present.



Picture 3. Typical homestead for families in the Khobi Municipality



Picture 4. In the late afternoon cows return home from a day grazing somewhere. In average a household owns 3 cows.

3. Results

3.1 Profile of the surveyed households

From a total of 85 households whose responses were obtained 47 (55%) were females and 38 (45%) males. Among the respondents the majority (87%) were unemployed, 13% were civil servants. Though half of the unemployed consider themselves being small farmers. Family size was in the range of 3-4 persons. See table 1.

Table 1. Profile of the respondents and surveyed households

Characteristics	Chaladidi		Khorga		Total	
	Number households	%	Number households	%	Number households	%
Households	40	47	45	53	85	100
Sex of respondents						
Female	22	55	25	56	47	55
Male	18	45	20	44	38	45
Age of respondents						
18-30	7	17	8	18	15	17
31-45	17	43	19	42	36	42
46-60	11	27	12	27	23	28
≥60	5	13	6	13	11	13
Family size of households						
1-3	36	90	39	87	75	88
4-6	4	10	6	13	10	12

3.2 Number and species of animals kept by the households and their stabling

Out of the 85 interviewed households 80 (94%) households have in ownership some animals. Number of responding households in the two assessed villages that own cows comprised of 79 (93%), on average one household own 3 cows. The percentage of responding households that own horses is 68%. In the two villages pigs are owned by 74% of the respondents. Chickens are owned by almost all respondents; on average one household owns 10-15 chickens, geese is owned by 54-63% of households surveyed, Turkeys are owned by 61 respondents (72%). See figure 1 and table 1.

Figure 1. Percentage of households with animals

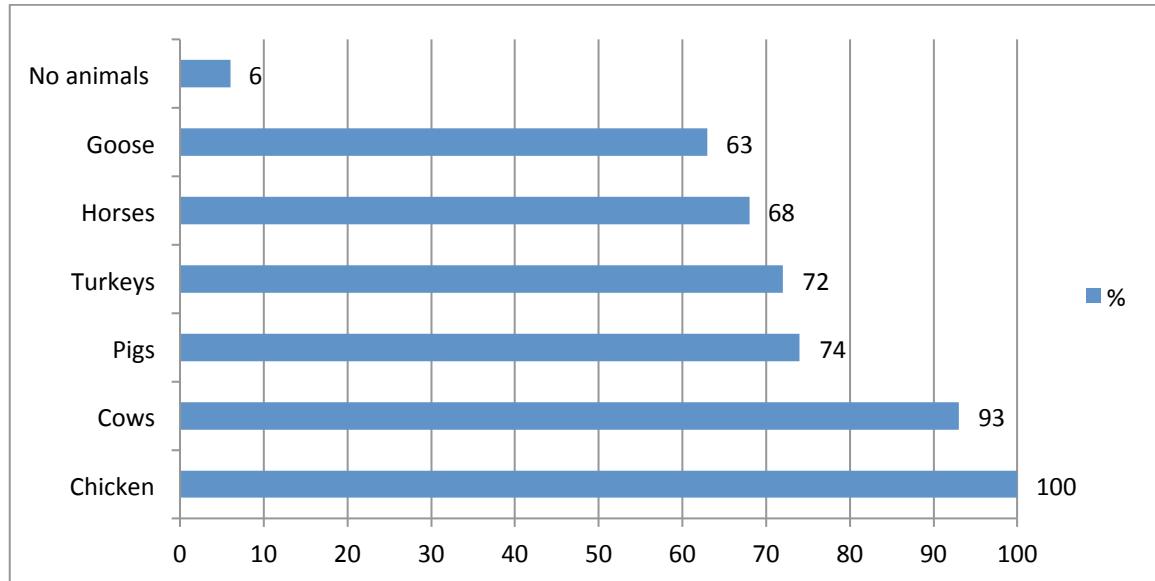


Table 2. Number of animals owned by the 85 respondents and the average of the specific kept animals per household

	Chaladidi		Khorga		Total	
	Number	Average per household	Number	Average per household	Number	Average per household
Cows	134	3	148	3	282	3
Horses	27	1	31	1	58	1
Pigs	54	1.2	64	1.4	118	1.4
Chicken	580	15	740	16	1320	16
Goose	120	3	140	3	260	3
Turkeys	160	4	210	5	370	4.5

When the question was asked about keeping the animals in stables 57 (72%) of respondents answered that in summer they keep cows, and pigs outside; 55 (95%) horses are kept outside. This implicates that the manure is spread directly in the field. 23 (28%) respondents keep the animals during the

nighttime in a stable in summer. Chickens, geese, turkeys are kept by the respondents during the nighttime in poultry sheds and in the daytime outside. The respondents mentioned, in winter the cows are kept in the stable at night, 95% of respondents keep the horses outside at day and night in winter too.

Table 3. Overview on how the animals are kept

	Summer		Winter	
	In the day	At night	In the day	At night
Cows	72% outside	28% in a stable	80% outside	100% in a stable
Horse	95% outside	95% outside	95% outside	95% outside
Pigs	72% outside	28% in a shed	80% outside	100% in a shed
Poultry	Outside	In a shed	85% outside	100% inside

3.3 Type of toilets used by the households

From a total of 85 households assessed for the type of toilet they use, 79 (93%) respondents have pit latrines, 6 (7%) respondents have flush toilet, with a septic tank located nearby the house. See table 4. The toilets observed by the investigators team are in poor condition and badly maintained with a specific smell easily accessible for rodents and insects. The assessment also revealed that 79 (93%) of the households do not have appropriate wastewater disposal systems.

Table 4. Type of toilets used by the surveyed households

Types of toilets	Chaladidi (households)	Khorga (households)	Total (households)
Flush toilet + septic tank	2 (5%)	4 (9%)	6 (7%)
Pit Latrine	38 (95%)	41 (91%)	79 (93%)

3.4 Components of household waste and its management

In general plastic wastes in landscapes, at river and sea banks are considered as the most anesthetic waste component. In the target region no public plastic waste collection has been established. Therefore the survey assessed also what household do with the plastic leftovers. The surveyed households stated, plastics are for them the main component of household waste, which is not used and thrown away. Although, 65% of respondents use plastic bottles for different household needs.

The interviewees were asked what they are doing with the different components of waste, whereas the possibilities were given: fed to animals, burned in the stove or in the field, buried in the garden or field, or disposed in the field/garden or at the riverbank, or others.

From a total of 85 households whose responses were obtained, 15 (18%) explained that they burn the plastic waste in stoves, and 45 (53%) burn the plastic waste in the field; 25 (29%) dispose their plastic waste at the riverbank.

All 85 (100%) interviewed households mentioned, to burn paper, which is not used anymore, in their stoves.

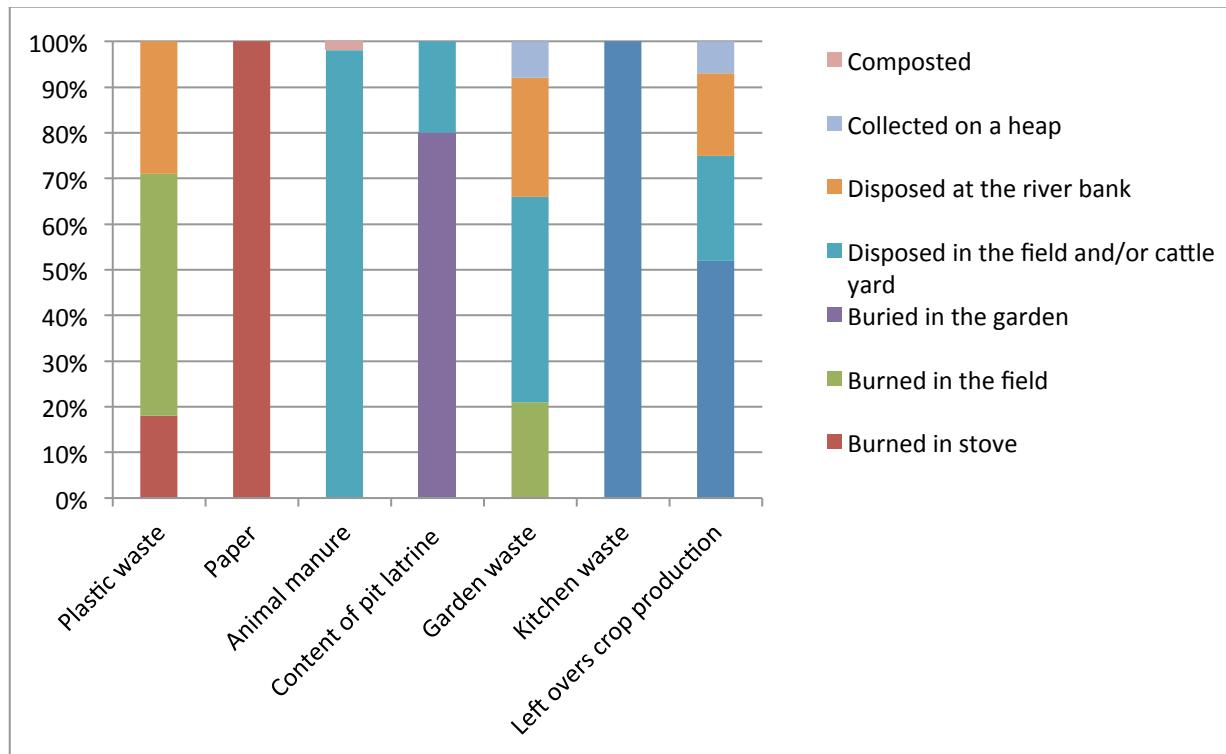
Out of 85 respondents, 40 (47%) dump animal manure in the cattle yard and 43 (50%) dispose animal manure in the field. Only 2 (2%) compost the animal waste. However, 82 (96%) of the households

reported they use the solid animal waste for fertilizing the fields. This, however, is done without prior proper storage and composting operations.

Concerning fecal and sewage sludge (contents of the pit latrine and septic tank), 80% of the respondents interviewed, mentioned that they bury the fecal sludge in the garden, 17 (20%) of the respondents dispose the toilet waste in the field. The way toilet wastes are treated may cause a threat to the environment, especially water systems.

Garden waste: the study revealed that 18 (21%) households burn garden waste in the field; 45 (53%) dispose the garden waste in the field and 22 (26%) dispose their waste at the riverbank.

Figure 2. Methods used by the households (in percentages) to handle the different solid waste components



3.5 Treatment and usage of animal and human excreta and other organic waste

On the question if the households do so, how do they treat the animal and human excreta and the other organic waste components, the questionnaire offered the choice between the waste is collected on a heap, composted, spread directly on own garden or field or it is not used.

During daytime and if the cattle are not kept inside, cows and pigs walk freely around in the village or on a pasture. Therefore in case the option “spread directly on own garden or field” is chosen, it can be assumed that the manure is dropped by the animals on the field or garden. According the answers of the respondents it seems the solid component of pig manure is not collected, but solids of cow manure (collected from the stable) is collected on a heap by 62% of the households. See the following summary and Figure 2.

Cow manure: Most of the respondents 52 (62%) collect the solid component of the cow manure on a heap for fertilising the garden or agricultural fields. Only 2(2%) of the respondents compost the cow manure and 31 (36%) spread the manure directly on the garden or yard;

Pig manure: 85 (100%) of respondents spread the solid component of the pig manure directly on the garden or yard;

Poultry manure: 83 (98%) of the respondents stated to spread the poultry manure directly on the garden or yard and in 2 (2%) of the households composted the poultry manure;

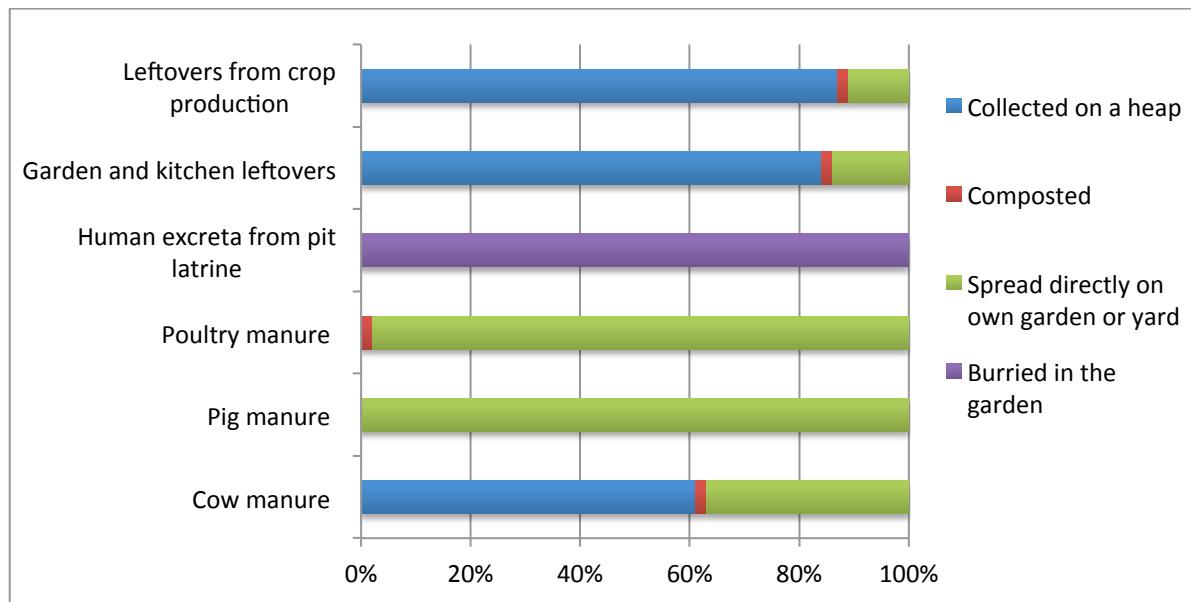
Human excreta: After the pit of the latrine is filled, 100% of respondents stated to bury the toilet contents directly in the garden or yard;

Garden/ kitchen leftovers: 71 households (84%) collect these organic wastes on a heap, 2 (2%) compost the leftovers, 12 (14%) spread the leftovers directly on the garden or yard;

Leftover from crop production: 74 (87%) of the surveyed households collect the left overs from crop production on a heap,

As observed in section 3.4 finally the leftovers of the kitchen and crop production are mainly fed to the animals. Nevertheless approximately one quarter of the garden waste and left overs of the crop production are disposed off at the nearby riverbank.

Figure 3. Treatment of animal and human excreta and other organic waste



3.6 Interest to organize a village communal composting place for organic waste and expectations

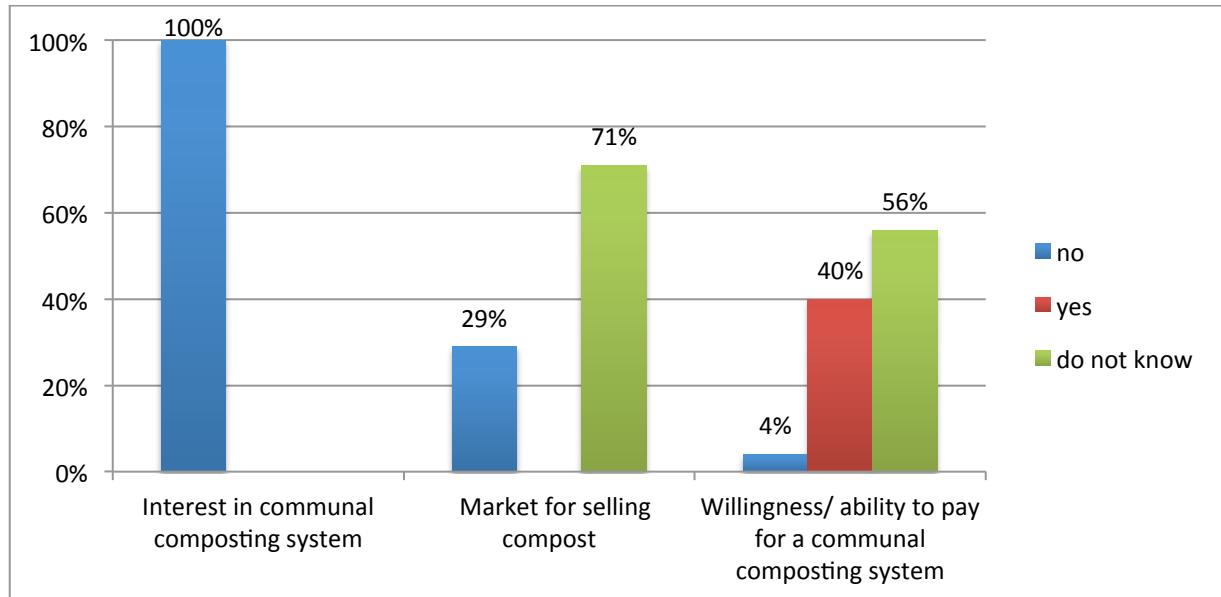
The survey assessed the interest of the communities about a communal composting system for the several organic waste components, including garden waste and the contents of the pit latrines and septic tanks. Also their willingness and/or ability to pay for a communal composting system were investigated.

Interest in communal composting system: 85 (100%) of the respondents mentioned not to know if they are interested, while they know nothing about such communal composting system;

On the question if they think there could be a **market for selling compost**, 25(29%) responded negatively, 60 (71%) had no answer;

Willingness and ability to pay: 3(4%) of the respondents are willing and able to pay for a communal composting system, 34 (40%) are not willing and able to pay, 48 (56%) of the respondents did not know if they are willing or able to pay for a communal composting systems.

Figure 4. Interest in communal composting system, opinion on market for selling compost, and willingness/ability to pay for a communal composting system in percentages



3.7 What the households are doing with leftovers from pesticide, oil and medicine

80 (94%) of respondents mentioned they do not use pesticides, 5 (6%) respondents stated to bury **leftovers from pesticides** in the field;

The survey also showed the **leftovers from oil** e.g. from tractors or other machines. 75 (88%) of the respondents burn leftovers of oil and 10 (12%) throw away;

On the question what families do with **leftovers from medicines** all the respondents (100%) said to throw away the leftovers of medicine.

3.8 The most problematic waste component experienced by the households

On the question “What is for you the most problematic component of waste in your household in the agriculture?” an overwhelming majority of respondents consider that the most problematic component of waste is

- Toilet waste
- Excreta and cattle urine

The respondents consider these organic waste components as the most problematic especially since they are producing unpleasant odour in the surroundings,

About 97% of the respondents revealed that the responsibility of waste management is left to women and girls.

3.9. Estimation of the accumulated nitrogen load in Chaladidi and Khorga

Animal and human excreta are rich in macronutrients and micronutrients. Under the precondition the excreta are adequately collected and treated, human excreta are safe to be used as a fertilizer and are beneficial for gardening and agriculture¹. Nitrogen is one of the main macronutrient applied as fertilizer on one hand and one of the major pollutant of the water resources (groundwater and surface waters) on the other hand. Based on the findings of this survey, an estimation was made of the amount of the nutrient nitrogen accumulated in one year in the two target villages, whereas only the main producers of nitrogen, inhabitants, cows and pigs, were included in the estimation. See table 5.

This estimation does not claim to give exact and well-balanced data on the total accumulated amount of nitrogen in the two villages. Nevertheless an impression of the possible loss of valuable nutrients, such as nitrogen, into the environment is given. The estimation is based on data collected in the villages and from literature, and only the main contributors to the nitrogen accumulation (inhabitants, cows and pigs) were included in the calculations.

Due to many uncertain and unknown variables influencing the excretion of nitrogen, mostly the lowest or medium amount of possible excreted nitrogen was used.

Inhabitants

Total inhabitants of the villages Chaladidi and Khorga is 2,565, the total number of 677 households.

The concentration of the nutrients depends on the diet of the people. For example in Sweden, in average human excreta collected per capita and per year contains 4 kg N/cap/year, in India 2.3 kg/cap/a and in China 3.5 kg/cap/year.²

For the nitrogen estimation the following assumption were made:

Concentration in human excreta: Nitrogen 3.5 kg/cap/year;

Accumulated and excreted nitrogen by the inhabitants of the two villages is 8,978 kg/ year, an amount enough for fertilizing 75 hectare for crop production (assuming an application of 120 kg nitrogen per hectare).

According the results of the survey, actually all nitrogen originating from human excreta are lost for fertilizing purposes, hence for food production.

Cattle

The amount of nitrogen excreted by livestock is as for people, greatly influenced by the diet, by the amount of nitrogen taken in by feed. Furthermore, because nitrogen is also found in milk, the level of lactation (e.g. of a cow) will influence the excretion of nitrogen via the manure but also the age and the weight of the cow³.

In the target villages the amount of nitrogen intake, neither the weight of the cows or the level of lactation is known. Nevertheless the local cows are of a small breed and their feed is probably not nitrogen-rich. Hence for making an estimation of the yearly-excreted nitrogen, a low rate of nitrogen

¹World Health Organisation, 2006. Guidelines for the safe use of wastewater, excreta and greywater.
http://www.who.int/water_sanitation_health/wastewater/gsuweg4/en/index.htm

² Stockholm Environment Institute, 2010. Practical Guidance on the Use of Urine in Crop Production.
http://www.ecosanres.org/pdf_files/ESR2010-1-PracticalGuidanceOnTheUseOfUrineInCropProduction.pdf

³ ADAS report to Defra, 2007. Nitrogen output of livestock excreta.
<http://archive.defra.gov.uk/environment/quality/water/waterquality/diffuse/nitrate/documents/consultation-supportdocs/f2-excreta-n-output.pdf>

excretion of 24 kg/animal/year for growing cows of 0-1 year old and with a medium intake of nitrogen⁴ was assumed.

According to this survey, in Chaladidi and Khorga 93% of the households have in average 3 cows, resulting in total 1,890 cows with a nitrogen production of 45,361 kg/year.

According to the respondents during the summer at nighttime the cows are kept in a stable (local observations estimated approximately 12 hours). At daytime the cows are grazing outside and the dropped excreta “fertilize” the grasslands. At wintertime, the cows are kept day and night mainly in stables.

Hence it is estimated, that at least half of the nitrogen from the cow excreta is dropped in the stables, resulting in approximately 23,000 kg nitrogen; sufficient to fertilize 200 hectare agricultural field.

However the liquid manure of the cows is not collected and is infiltrated from the stables into the soil and lost for food production.

Pigs

Also the excreted nitrogen by pigs depends on many variables such as feed, age and function of the animal (breeding, weaning or growing). For the estimation of the excreted nitrogen by pigs, kept in both villages, it was assumed the pigs are growers with an average nitrogen excretion of 11 kg/year⁵

According to this survey, in the two villages 74% of the households have in average 1.4 pigs, resulting in a total amount of 700 pigs (in 500 households) excreting 7,700 kg nitrogen per year.

Table 5. Estimated amount of nitrogen accumulated in the villages Chaladidi and Khorga

Source	Kg nitrogen per year	Actual practiced usage
Inhabitants	8,978	Buried and infiltrated in soil
Cows	45,361	Solid manure on a heap/spread directly in garden and grassland/ liquid manure (stable) infiltrated in soil
Pigs	7,700	Spread directly on garden /liquid manure (shed) infiltrated in soil

4. Conclusions

Organic wastes represent a large proportion of the solid waste stream in both communities.

Management of solid waste in Chaladidi and Khorga at the household and community level is in poor condition. The most obvious environmental damage caused by solid waste is aesthetic.

A more serious risk is the transfer of contaminants to ground water and land, flow-off of disposed waste into the river and ditches, as well as the pollution of air from improper burning of waste. Many waste activities generate greenhouse gases like landfills generate methane and refuse fleets are significant sources of carbon dioxide and nitrous oxide.

Open, unregulated dumps are still the predominant methods of waste disposal in most of the households. This indicates that the dumped wastes are exposed to insects and rodents.

⁴Idem

⁵Idem

Solid waste (excreta) management methods and maintenance of sanitation facilities practiced by the communities may represent a risk to public health.

Most of the households use traditional pit latrines that are in a deplorable sanitary condition and affecting negatively the environment. Yearly, about 8,000 kg nitrogen originating from human excreta is buried and/or infiltrated in soil and lost for food production.

Based on the results of the survey and observations, it can be assumed that yearly the cows excrete at least 23,000 kg nitrogen during their stay in stables, and which is disposed in the environment without a proper collection, storage and treatment.

The present study indicates that the vast majority of the households utilize solid waste components of animal excreta for their fields as an organic fertilizer. This, however, is done without the use of proper composting operations.

Liquid manure is directly disposed in the open area and/or infiltrated from the stable directly in the soil.

Lack of knowledge on the unfavorable health outcomes of animal and human wastes may increase the occurrence of infectious diseases.

Lack of appropriate collecting plastic wastes force the inhabitants to burn their plastic waste, posing a threat to the environment and to the peoples' health. Many plastics contain a chlorine component, which during inappropriate burning processes leads to harmful substances, such as dioxins in the environment.

Waste disposal practices employed by both communities are significantly associated with little knowledge and awareness of the respondents particularly on animal and human waste management, impacts on environment, social and economic development.

Lack of knowledge, awareness and provisions to proper solid waste management and sanitation facilities can hinder the development of the communities.

5. Recommendations for the community

There is no single solution to the challenge of waste management. The waste management process is usually framed in terms of generation, storage, treatment, disposal and re-use, with transportation inserted between stages as required. Farm households generate large amounts of solid and liquid waste streams that can pose a number of environment, economic and health problems if not treated properly.

Waste represents valuable resources as ground cover to reduce erosion, fertilizer to nourish the crops, the source of energy upon which community social enterprises (social entrepreneurship) could be developed and the management of waste should focus on how to find the value and redirect it back to the community.

Improving sanitation conditions is not only an environment, socio-economic and development issue, but also a matter of self respect, human dignity and public health.

The assessment recommends the following actions in order to improve solid waste management and sanitation in the assessed communities of Khorga and Chaladidi:

- Support the communities in Khorga and Chaladidi developing appropriate solid waste management strategies, reducing the environmental pollution;
- Change behavior among the population, community based education on waste management, sanitation and hygiene is essential and should be practiced;

- Increase public awareness and participation on effective waste management;
- Encourage the safe use of organic wastes for economic benefits such as fertilizer and soil conditioner, through composting which is adequate to treat organic wastes and is an effective and affordable waste management strategy for farm households and others;
-
- Develop and introduce appropriate local technologies for human and animal waste management (Urine Diverting Dry toilets, grey water treatment systems, solid waste storage systems, manure platforms, biogas digesters, soil filters etc.);
- Promote and introduce community cleaning-up activities.

6. Recommendations for the local authorities/government

- Strengthen local government units for more efficient and reliable solid waste management, and in particular for plastic waste, animal and human excreta through capacity building and higher prioritizing of these issues;
- More political and financial support is needed to arrange and maintain solid waste disposal sites in the communities;
- Integrate solid waste management into development plans of the municipalities;
- Involve the local communities for planning and implementation;
- Establish a more conducive environment for developing community based sanitation systems;
- Give targeted incentives for communities, which invest in improving the sanitation conditions and waste management.

Further studies are needed focusing on integrated waste management options at regional level such as re use, recycling and composting which contributes to economic development efforts.

Ideally, waste management should go beyond pollution and disease prevention for humans and should benefit society by providing economic gain for families and communities. The preferred approach for dealing with solid waste is an integrated solid waste management, which means considering not only the appropriate disposal of solid waste but integrating this with other management options such as minimizing waste production, recycling, composting and other waste recovery options.

Annex

Questionnaire on situation of solid waste and excreta management in the two target villages Khorga (1.320 Inhabitants.) and Chaladidi (1.245 inhabitants)

Date of interview:

Name of village:

Street:

Profile of respondent's household:

Name (optional)	M/F	Age	Size of household

1. Please mention the number of animals you have and the periods they are kept in a stable:

	Number	Only during night time in a stable	Number of month Day and night in a stable
Cows			
Horses			
Pigs			
Chicken			
Geese			
Other			

2. What kind of toilet do you have?

Flush toilet + septic tank	
Pit latrine	

3. What is the main component of your household waste, which you throw away and do not use. Please give a score according the volume of waste: 1 to 5, where as number 1 means the waste component with the biggest volume

Plastic	Paper	Animal waste	Garden waste	Kitchen waste

4. What are you doing with the different components of waste? Please tick the relevant box and see also question 5 for other options for organic waste.

	Fed to animals	Burned in stove	Burned in the field	Buried in the garden	Disposed outside the home stead, in the field	Disposed at the river bank
Plastic						
Paper						
Animal waste						
Waste of the pit latrine/septic tank						
Garden waste						
Kitchen waste						
Left overs of crop/fruit production						
Others /remarks						

5. If you do so, how do you treat animal and human excreta and other organic waste?

	Collected on a heap for garden/agriculture	Composted	Spread directly on own garden or field	I don't use this
Cow manure				
Pig manure				
Poultry manure				
Content pit latrine, septic tank				
Garden and kitchen left overs				
Left overs from crop production				

6. Would you like to have in your village a communal composting place for organic waste?

	Yes	No	I do not know	I want to keep this waste for my own	Remarks
Are you interested in having in your village a communal composting system for animal and garden waste, content of pit latrines etc.?					
Do you think there could be a market for selling compost?					
Are you willing and able to pay a small amount of money for communal organic waste collection and composting?					

7. If applicable, what are you doing with other wastes such as:

	I don't have	Burning	Burying	Throw away	others
Left-overs of pesticides					
Left-overs of oil					
Left-overs of medicines					

8. What is for you the most problematic component of waste in your household in the agriculture?
Please explain