

Household Assessment of Plastic Waste Management in the Urban Commune of Faranah (Republic of Guinea)

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Abstracts :- This study focuses on the management of plastic waste from households in Faranah. The objective is to establish an inventory of the management of plastic waste by households to allow stakeholders to have a synoptic picture of the situation in order to make decisions. Data collection was carried out on the basis of household surveys, interviews with stakeholders, direct observations and sampling. The results show that the 8,374 households that make up the urban commune of Faranah produce a total quantity of 36,500 Tons/year of household waste, of which plastics represent 20%, or 7,300 Tons/year, or approximately 20 Tons/day. The average production of plastic waste per person is 0.4Kg/day/inhabitant. This waste, particularly plastics, is very poorly managed: 75% is thrown into illegal dumpsites; 15% is sent to conventional landfills; 8% are directly incinerated in the open air at household level without energy recovery; Only 2% is recovered either by resale to recycling industries or by private initiatives such as the making of ecological paving stones which is starting to see the light of day. This results in potential air and water pollution, loss of biodiversity and constitutes a threat to human and animal health.

Keywords:- Waste, Plastics, Households, Management, Faranah.

I. INTRODUCTION

The march towards development and the progress of nations in the world have generated more new consumption habits and practices in the countries of the North (developed) than in those of the South (developing). If in the North measures are regularly taken to protect human health and the environment, in the South, much remains to be done

(UEMOA 2013). These countries are finding it increasingly difficult to cope with the multiple quantities of household waste produced by their populations. The management of the latter has become, as GNANGUI 2010 said, cited by BANGOURA 2017, "one of the environmental problems facing the cities of these countries and which must be addressed".

Plastics, polymers of very variable composition, have become everyday objects with unique properties in the world of materials: rigidity, flexibility or elasticity, mechanical and chemical resistance. The use of plastics dangerously affects the planet because they give rise to various potentially toxic wastes which have now invaded all of its surface envelopes, continental surfaces, fresh waters, the atmosphere and the oceans. Their lifespan extends from approximately 500 to 1000 years. (Institut de France, report from the Academy of Sciences 2021).

If we question the process of collection, transport and landfill of solid waste in African States, we note the notable absence of specific management of plastic waste, even if we observe innovative practices in places. Initiatives to reduce plastic waste exist in virtually every state, but they are buried in the abundant literature on solid waste. The environmental impacts of plastic waste are of various kinds. We note health extensions, distress in the living environment and in urban landscapes, very negative repercussions in sanitation works, risks incurred by animals and in agriculture and a negative impact on the preservation of water resources (UEMOA 2013).

The Republic of Guinea, like some of its peers in Africa, is not spared from the invasion of waste in general and plastic waste in particular. It produces 500,000 tonnes of

plastic waste per year across the national territory (MEEF, 2018). In all major cities in the country, including the urban commune of Faranah, plastics are found everywhere: in homes, on roads, in gutters, in markets and other public places, and in the vast majority of waterways. ... The consequences of this unsanitary conditions are disastrous, they negatively impact human health, the living environment, livestock breeding, agriculture, water resources (KABORE 2009, SIDIBE 2011, UEMOA 2013).

A thorough reading of these risks brings into line the relevance of assessing households on the management of plastic waste in the CU of Faranah. This involved carrying out a descriptive and transversal diagnostic study which allowed us to take stock of the situation and propose a community strategy based on institutional, legal, environmental, technical and socio-economic measures conducive to sustainable management of plastic waste. .

II. METHODOLOGY

➤ *Presentation of the Study Area*

This study was carried out in Faranah located between 10°02' and 10°10' north latitude and between 10°42' and 11°50' west longitude at an average altitude of 340m. It covers an area of 13,000 km² for a population of 280,511 inhabitants, i.e. an average density of 22 inhabitants per km² (RGPH 2014).

A little varied relief composed of a vast monotonous plateau, cut by large plains and dotted with hills. The climate is Sudano-Guinean type with the alternation of two seasons: a six-month dry season (November-April) and a rainy season (May-October). Vegetation composed of wooded and grassy savannah.

It is limited: to the North by the prefecture of Dabola; to the South by the prefecture of Kissidougou and Guéckédou; to the East by the prefecture of Kouroussa to the West by the prefecture of Mamou and the Republic of Sierra Leone. It has eleven (14) rural communes, namely: Banian, Beindou, Hèrèmakono, Nialya, Songoyah, Tiro, Tindo, Marella, Passayah, Sandénia, Kobikoro, Dantiliya, Bambaya, Kissi ballaya and the urban commune.

Our study area is the city center of Faranah located 460 km from the capital Conakry, made up of 12 districts which extends over an area of 47 km² and has 50,241 inhabitants, i.e. a density of 1068 inhabitants. /Km² (Faranah Town Hall 2023) with 8,374 households, an average of six (6) people per household according to the results of the surveys. 75% of the population practices agriculture, followed by livestock breeding 15% and fishing 7% which are basic socio-economic activities; crafts and commerce are little practiced, i.e. 3%.

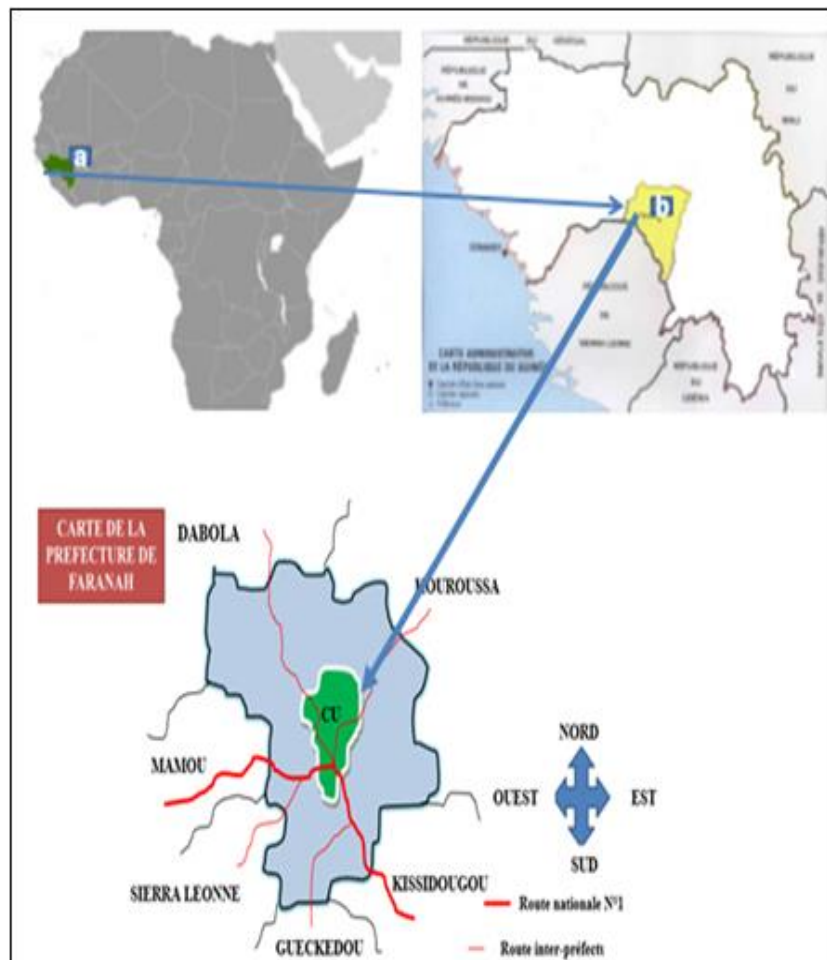


Fig 1 Geographic Location of the Town of Faranah

Figure 1a: situation of Guinea in relation to Africa; **Figure 1b:** situation of the Faranah prefecture in relation to Guinea; **Figure 1c:** situation of the urban municipality in relation to the prefecture.

➤ *Type of Study and Target Population*

This study is descriptive and transversal with purposive (non-probabilistic) sampling. It focused on quantitative and qualitative data from a survey including a structured and previously coded questionnaire which was administered to households in the urban commune of Faranah. It aims to assess the level of knowledge of the population of the urban municipality of Faranah on the management of plastic waste. It covered 8,374 households in the urban commune of Faranah with a total population of 50,241 inhabitants.

Sampling means choosing a limited number of individuals or events whose observation allows conclusions to be drawn applicable to the entire population within which the choice was made (BILOSO, 2008). Likewise, the sample is a subset of individuals from the target population, a group of individuals or objects which are supposed to represent the set of all individuals with the same common characteristics concerned by a study. It is from this group of individuals

that we can draw conclusions that are valid for the entire mother population (KISANGANI and KABAYA, 2005).

For this stage of our study, we used purposive (non-probability) sampling because it allows us to conduct a study on a part of the population which has the same characteristics or which carries out the same activities. The result obtained can be extrapolated to the entire population (GRAWITH, 2001) so that the distribution of the descriptive criteria of the sample selected is identical to that of the population studied. For this purpose we chose our interlocutors who are the heads of households (men or women) forming our sample. The sample size was determined based on:

- *The recommendations of the WHO (World Health Organization) which stipulates that the sample can always range from 1 to 20% of the total population for a population greater than 10,000 inhabitants;*
- *The theory according to which the larger the sample, the more representative it is of the whole.*

We chose 5% of 8374 households, or 419 households distributed proportionally between the different neighborhoods according to the number of inhabitants.

Table 1 Distribution of the Sample by Neighborhood According to the Number of Inhabitants

N°	Districts Number	(E) Sample	(Ex 0.0083)
1	Slaughterhouse 1	2890	24
2	Slaughterhouse 2	4463	37
3	Dandaya	3754	31
4	Faranah Koura	3338	28
5	Aviation	5088	43
6	Sirkolény 1	4625	39
7	Sirkolény 2	2708	23
8	Market1	4571	38
9	Market 2	3286	27
10	Tonkôlonkô 1	5046	42
11	Tonkôlonkô 2	5318	44
12	Mosque	5154	43
	Total	50 241	419

➤ *Data Collection Tools, Methods and Techniques*

To collect data, we used direct observation of the state of hygiene, sanitation and plastic waste management of households in the urban commune of Faranah and interviews using survey sheets forming the questionnaire, designed according to the objectives, its content is of three types in our case: open (free response), closed (yes/no) and multiple choice. These activities were carried out by the investigators who are students of license 4 of the Rural Engineering department of the Higher Agronomic and Veterinary Institute of Faranah (ISAV/F) selected and trained for this purpose. Data entry was done using Word software. For data processing, we used the Excel program.

➤ *Criteria for Acceptability of Results*

To ensure the veracity of the results, the survey groups were formed in such a way that each household received a visit from two independent investigators and the two survey

sheets obtained for each household were assessed according to the rating indices. Following: 0% no respondents; 25% pretty good; 50% good, 75% very good and 100% excellent. Only the results of the files having obtained a better percentage (75% or 100%) are considered. Households whose cards obtained low ratings benefited from a third investigator and the latter's results made it possible to make a decision.

➤ *The Rules of Ethics*

Before starting an interview with a household, we took the time to explain the objectives of the study as well as the serious consequences caused by plastic waste and ultimately the possibility of directing them towards effective and sustainable solutions to overcome this problem. scourge. We also guaranteed strict compliance with confidentiality standards during our study. Considering all of the above, our study respected freedom and consent

III. RESULTS

➤ *Information Relating to Respondents*

Table 2 Characteristics of Respondents at the Household Level

N°	Parameter	Effective	%	
1	Sex	man	275	65,63
		Female	144	34,37
		Total	419	100
2	Age (years)	< 30	14	3,34
		[30, 39]	212	50,60
		[40, 49]	127	30,31
		[50, 59]	39	9,31
		>60	27	6,44
		Total	419	100
3	Marital status	Married	315	75,17
		Divorced	12	2,86
		Widowed	38	9,06
		Single	54	12,9
		Total	419	100
4	status	Head of household status without local responsibility	383	91,41
		Head of household with local responsibility	36	8,59
		Others	0	0
		Total	419	100
5	Level of study	Primary	95	22,67
		Secondary	63	15,03
		Superior	32	7,03
		Not in school	229	54,67
		Total	419	100
6	Occupation	Civil servant	27	6,44
		Worker	39	9,31
		Farmer	315	75,18
		Trader	15	3,58
		Others	23	5,49
		Total	419	100

It appears from this table that 65.63% of the respondents are men who are mostly heads of household. Among the respondents 50.60% are young people aged 30 to 39 years old followed by 30.31% of respondents aged 40 to 49 years old. On the marital status of the respondents, we note 75.17% married. All respondents are heads of

households, among whom 91.41% do not have any local responsibility. In relation to the level of study, 54.67% of respondents are not educated. By looking at the profession of the respondents, 75.18% practice purely extensive agriculture which is the main basic socio-economic activity. Household knowledge on plastic waste management.

Table 3 Household Knowledge of Plastic Waste Management

N°	Parameter and assessments Workforce	Effective	%	
1	Reason for using plastics	Cheaper	388	92,60
		Easy to use	22	5,25
		Civility or modernity	9	2,15
		Total	419	100
2	Origin of plastic waste	Household	389	92,84
		Others	30	7,16
		Total	419	100
3	Causes of unsanitary conditions	Lack of Pre-Collection	175	41,76
		Poverty	82	19,57
		Illiteracy	65	15,51
		Incivism	60	14,33
		poor urbanization	22	5,25
		Lack of trash cans	15	3,58
		Total	419	100

4	Types of plastic waste	Bags and Packaging	327	78
		Box-can-bottle	42	10
		Utensils	38	9
		Others	12	3
		Total	419	100
5	Presence of trash cans	Yes	367	87,59
		No	52	12,41
		Total	419	100
6	Bin storage locations	Concession compound	202	55
		Front of houses	140	38
		Other places	25	7
		Total	367	100
7	Frequency of emptying bins/week	Every day	166	45,23
		Several times	121	32,97
		Only once	80	21,80
		Total	367	100
8	Bin emptying locations	Empty spaces	221	60,22
		Streets and gutters	84	22,89
		Watercourse	32	8,72
		Picked up by a service	20	5,45
		Conventional deposits	10	2,72
		Total	367	100
9	Use of plastic waste	Burned	140	33,41
		buried	0	0
		recycled	2	0,48
		sold	0	0
		No use	277	66,11
		Total	419	100

➤ *This Table gives us the Lessons below:*

- The massive use of plastics by households according to 92.60% of respondents is due to the fact that they are cheaper.
- Households constitute the main sources of production of plastic waste according to 92.84% of respondents, only 7.16% attribute their origin to other sources (industries, hospitals, etc.).
- The main causes of unsanitary conditions according to those surveyed are: lack of pre-collection structure (41.76%), poverty (19.57%), illiteracy (15.51%) and incivism (14.33%), poor urbanization (5.25%), lack of public trash cans (3.58%).
- Among the plastic waste encountered in Faranah, 78% of respondents believe that bags and packaging are the most dominant, followed by boxes-cans-bottles for 10% of respondents.
- Regarding the effectiveness of the presence of trash cans at the household level, 87.59% say they have trash cans compared to 21.41% who do not have any.
- Concerning the places where bins are stored, 55% of households store them in a corner of the compound, 38% place the bins in front of yards or houses, 7% of households use other places.

- Regarding the emptying of trash cans, the frequency is such that: 45.23% of households empty their trash every day, 32.97% empty it several times a week unlike 21.80% who empty it only once. times per week.
- One of the most important points to take into consideration in the management of plastic waste is the destination or place of discharge, for our study, 60.22% of households empty the trash cans into empty spaces, 22.89% throw waste in the streets and gutters, 8.72% in waterways, 5.45% of households say they subscribe to a collection service, the rest 2.72% use conventional dumps.
- We were interested in the use of plastic waste in Faranah, the results of the surveys show that 66.11% of households do not know what to do with plastic waste and therefore do not make any use; 33.41% think that they should be burned, only 0.48% say that they are recyclable either by making paving stones, or by using them in agriculture to make plant nurseries.

➤ *Common Plastic Waste Management Policy*

The table below deciphers the plastic waste management policy in Faranah by indicating the level of apprehension of households in relation to the regulatory and legislative framework governing the management of community waste and the support actors involved in the management garbage.

Table 4 Plastic Waste Management Policy in Faranah

N°	Parameter and assessments	Effective	%	
1	Existence of laws	Yes	268	64
		No	151	36
		Total	419	100
2	Law enforcement	Yes	8	2
		No	411	98
		Total	419	100
3	Sanitation Service	Yes	109	26
		No	310	74
		Total	419	100
4	Types of Service	NGO	37	8,83
		Municipal organization	382	91,17
		State service	0	0
		Total	419	100
5	Sanitation Campaign	Yes	419	100
		No	0	0
		Total	419	100
7	Participation in Sanitation campaigns	Yes	130	30
		No	289	70
		Total	419	100
8	Household education to Hygiene	Yes	44	10,5
		No	375	89,5
		Total	419	100
9	Number of education of households to Hygiene	Once	22	5,25
		Twice	15	3,58
		More than twice	7	1,67
		None times	375	89,5
		Total	419	100
10	Solutions envisaged for the good management of plastic waste	State involvement	126	30,07
		Distribution of sanitation equipment	108	25,77
		Encourage PME	81	19,33
		Educate and raise awareness	79	18,86
		Build processing plants	25	5,97
		Total	419	100

➤ *The following Results Emerge from this Table:*

- More than half of the households surveyed 64% know of the existence of laws guaranteeing good management but that they are not applied to 98% according to the respondents.
- 74% of households are unaware of the existence of a sanitation service, only 26% confirm their presence even if their area of intervention is very limited.
- In relation to the type of sanitation service, 91.17% of respondents consider its services to be municipal organizations and 8.83% think they are non-governmental organizations (NGOs).
- 100% of households testify to the effectiveness of the organization of sanitation campaigns, except that 70% affirm that they do not participate.
- Regarding household environmental education, 89.5% have not received any education compared to 10.5% who claim to have received training. Among those who have received education, 5.25% have done so once, 3.58% have done so twice and 1.67% have done so more than twice.
- As for the solutions to be considered to ensure the proper management of plastic waste, 30.07% of respondents affirm that strong involvement of the State is necessary by defining a national waste management strategy while guaranteeing laws, 25.77% opt for the distribution of sanitation materials to households, 19.33% ask to encourage SMEs, 18.86% believe that it is necessary to educate and raise awareness among households and 5.97% say to build sanitation factories. treatment.

➤ *Consequences of Poor Management of Plastic Waste.*

Table 5 Household Knowledge of the Impacts of Plastic Waste

N°	Impacts		Effective	%
1	Human health	Yes	396	94,52
		No	23	5,48
		Total	419	100
2	Animal Health	Yes	415	99
		No	4	1
		Total	419	100
3	Agriculture	Yes	54	18,89
		No	365	87,11
		Total	419	100
4	Air and water pollution	Yes	297	70,88
		No	122	29,12
		Total	419	100
5	Ugliness of spaces and living environment	Yes	419	100
		No	0	0
		Total	419	100

- This table shows that 94.52% and 99% of participants in our study affirmed respectively that plastic waste affects human and animal health.
- When seeking to know the impact of plastic waste on agriculture, 87.11% of participants know of no impact, 18.89% affirm the reduction of agricultural spaces and water infiltration problems.
- We noted that 70.88% of participants are aware of the pollution caused by plastic waste, particularly that of water and air.
- Regarding the impact on the living environment, all participants are unanimous on the effects caused by plastics, from the occupation of streets and spaces to the obstruction of gutters among others.

➤ *Characterization of Plastic Waste Produced by Households in Faranah*

- *Composition of Plastic*

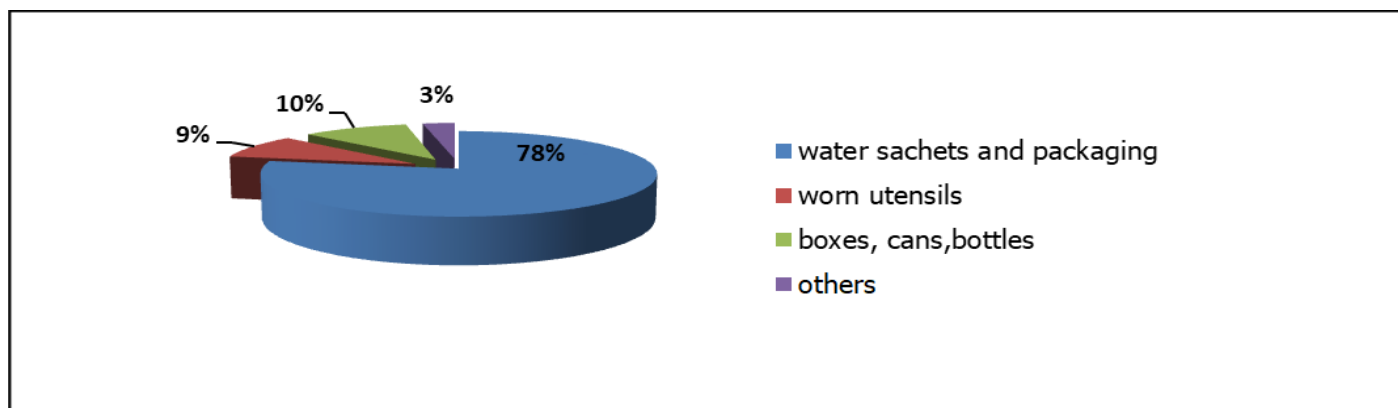


Fig 2 Composition of Plastic Waste from the Urban Commune of Faranah

We found in the plastic waste of the urban municipality of Faranah a large number of water bags and packaging for a cumulative rate of 78%, used utensils 9%, boxes, cans and bottles are at 10% and others 3%.

➤ *Composition of Plastic Waste and Production by Type of Habitat.*

Table 6 Quantity by Category of Plastics Produced According to the Type of Habitat

Plastic materials in Kg/Day/inhabitant	Average standing	Low standing	Rural housing	Average	%
sachets	0,2	0,2	0,1	0,167	41,75
packaging	0,15	0,05	0,05	0,083	20,75
Boxes-cans-botles	0,1	0,05	0,05	0,067	16,75
others	0,05	0,1	0,1	0,083	20,75
Total	0,5	0,4	0,3	0,4	100

The first lesson we draw from this table is that the production of plastic waste increases as housing becomes more modern. The daily production of plastic waste per inhabitant for a medium standard habitat is 0.56 kg, for low standard 0.4 kg and for a rural habitat 0.3 kg. The average daily production of plastic waste per inhabitant living in a household is 0.4 Kg/D/inhabitant. This quantity contains the vast majority of sachets, an average of 0.167 Kg/D/inhabitant (41.75%), followed by packaging with

0.083 Kg/D/inhabitant (20.75%), to which are added the bottles. and other types of plastic whose respective average quantities are 0.067 Kg/D/inhabitant (16.75%) and 0.083Kg/D/inhabitant (20.75%).

➤ *Total Quantity of Plastic Waste Produced in Faranah*

We deduce from this table that the total daily production of plastic waste in the city of Faranah is 20096.2 Kg/D or approximately 20 tonnes/D.

Table 7 Daily Quantity of Plastic Waste Produced by District

No.	Districts	Number	Quantity Kg/D
1	Slaughterhouse 1	2890	1156
2	Slaughterhouse 2	4463	1785,2
3	Dandaya	3754	1501,6
4	Faranah Koura	3338	1335,2
5	Aviation	5088	2035,2
6	Sirkolény 1	4625	1850
7	Sirkolény 2	2708	1083,2
8	Market 1	4571	1828,4
9	Market 2	3286	1314,4
10	Tonkolonkô 1	5046	2018,4
11	Tonkolonkô 2	5318	2127,2
12	Mosque	5154	2049,6
	Total	50 241	20096,2

➤ *Method of Managing Plastic Waste by Households*

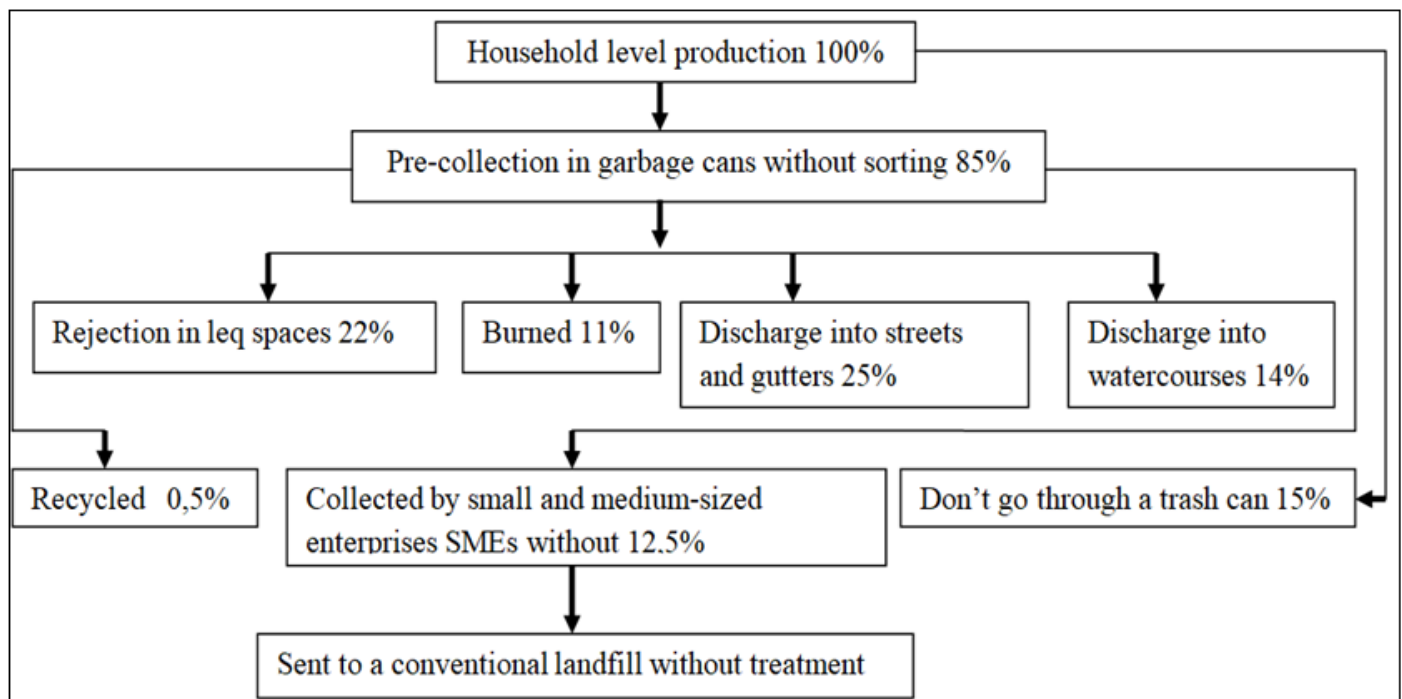


Diagram 1: General Presentation of the Method of Managing Plastic Waste in Faranah. Source: Survey Results

Reading this diagram shows that the plastic waste generated by households in Faranah is distributed as follows: 85% is pre-collected in the bins of course with other household solid waste (MSW), no household in our sample carries out selective sorting. The remaining 15% is directly thrown away without spending any time in a trash can. The pre-collected waste has the following destinations:

22% is rejected in empty spaces, 11% is burned, 25% is found in the streets and gutters, 14% in waterways, 0.5% is recycled and finally 12.5% is collected by the single SME in place, sometimes with the town hall service, and sent to a conventional landfill without any treatment.

➤ *Solutions Proposed for Sustainable Management of Plastic Waste*

We have made three (3) proposals to ensure the proper management of plastic waste from households in Faranah. The first is planning, the second is the strategic framework and finally the third is orientation towards management sectors.

• *Planning for Plastic Waste Management in Faranah*

After series of interviews with stakeholders regarding good plastic waste management planning, we proposed a planning diagram below. It provides guidance on the different steps to follow to have a broad vision of the situation in order to put in place a concrete action plan that can be implemented.

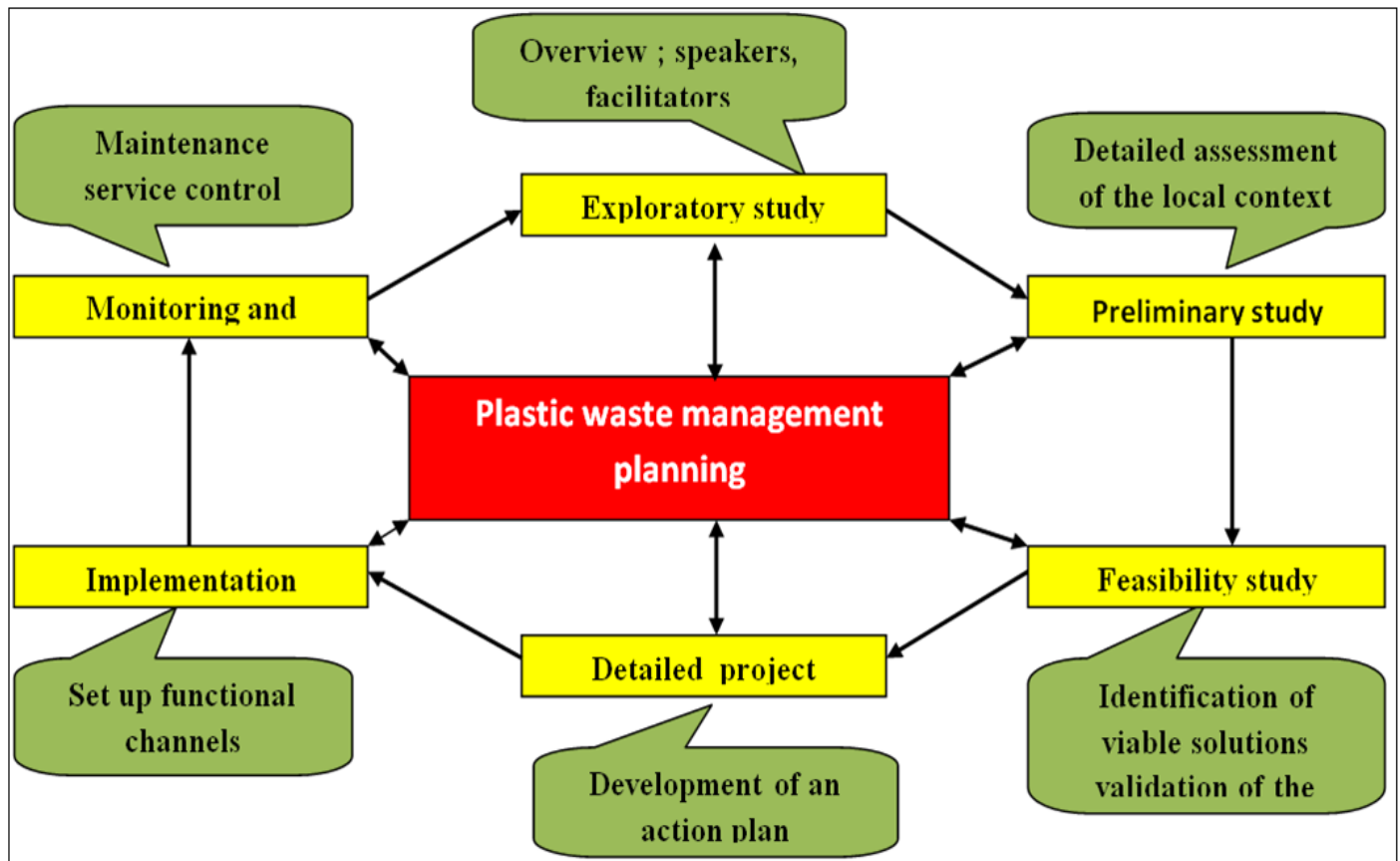


Diagram 2: Plastic Waste Management Planning in Faranah
Source: Results of Interviews with Stakeholders

The exploratory study which is the first stage aims to have an overview of the situation by taking stock of the situation based on a participatory diagnosis, it will identify the stakeholders and facilitators and take into account their commitment to the process. The preliminary study will allow a detailed assessment of the local context through zoning. For the feasibility study, it will involve, within a framework of restricted or expanded consultation, identifying viable solutions and validating the solutions chosen. A detailed project in which an action plan to be implemented will be clearly defined will be developed. The

entire process will be carried out under the aegis of a monitoring-evaluation committee responsible for control.

• *Strategic Framework for Plastic Waste Management*

Diagram No. 3 defines the strategic framework for plastic waste management that we proposed to be included as a skeleton of the action plan to be implemented. The main link of this strategy remains the 3Rs (Reduction, Reuse and Recycling).

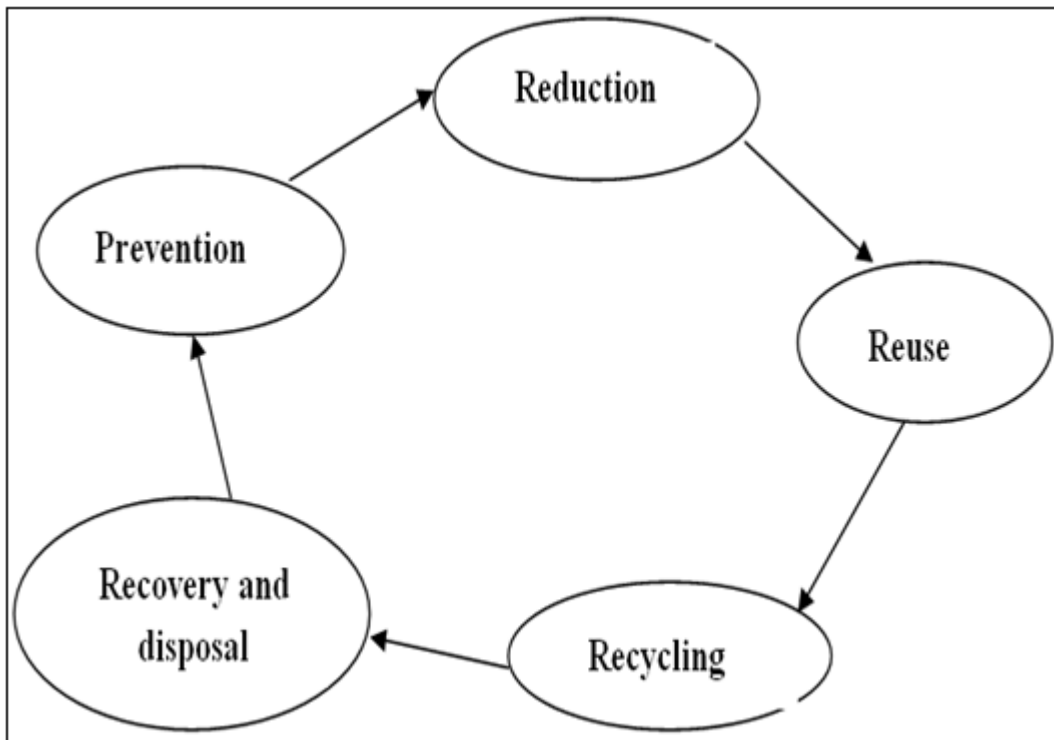


Diagram 3: Plastic Waste Management Strategy
Source: Results of Interviews with Stakeholders.

• *Plastic Waste Management Channels.*

For management sectors, we propose the methods found in the literature. They will make it possible to make a choice of the appropriate management technique according to the objectives set for the purpose of the process.

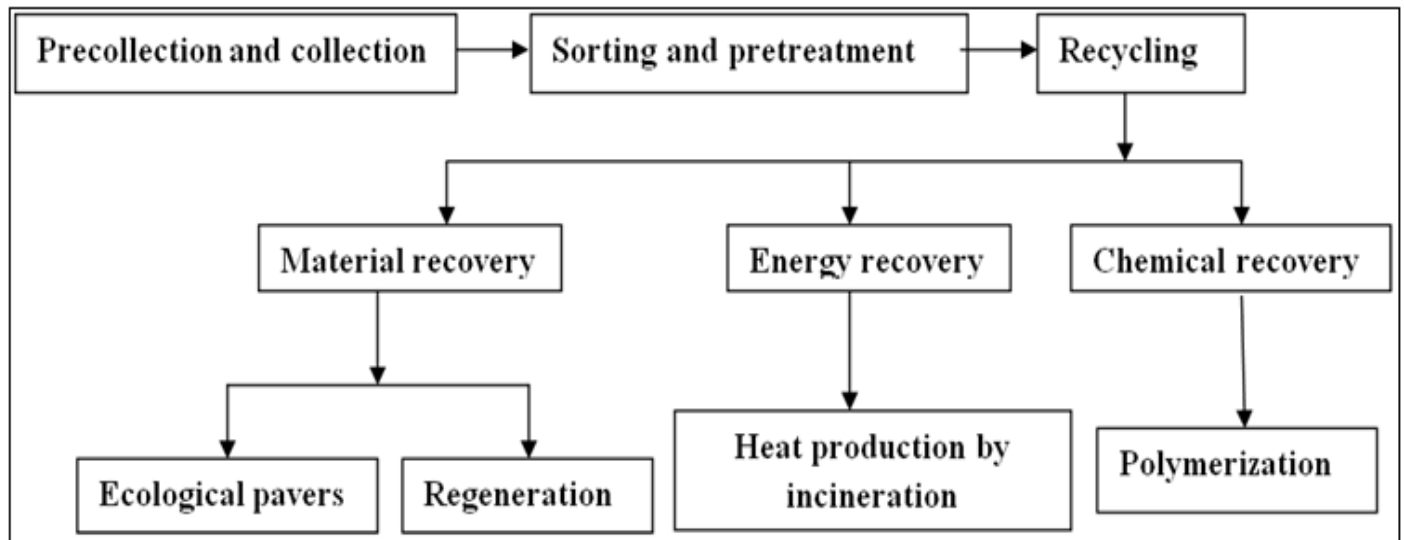


Diagram 4: Plastic Waste Management Channels
Sources: Literature Review

IV. DISCUSSION OF RESULTS

➤ *Identifying the Characteristics of the Participants*

For the gender of the respondents, 65.63% are men who are mainly heads of household. This result is confirmed by several studies including: the National Institute of Statistics (INS) 2018 where only 19% of households are headed by a woman in Guinea; WAKAM 2002 finds for Cameroon that out of 66,812 households, 57,702 are headed by men, or 86.36%; Another study carried out by FOTSO et Al. 1998 shows that in Cameroon four households out of five (4/5) or (78%) are headed by men and 22% of households are headed by a woman; finally VIGNIKIN and PILON 2006 find 11% of households headed by women for the whole of Burkina-Faso.

Concerning the age of the respondents, half 50.60% are young aged 30 to 39 years old followed by 30.31% from the age group of 40 to 49 years old which is explained by the fact that the majority of households in Faranah are made up of young people; households where the respondent is over 60 years old are not widespread in our sample; they represent 6.44%. This result is confirmed by the budgeted national action plan for family planning of Guinea (PANBPF-G) 2019-2023, according to which, the demographic profile of Guinea is that of a country with a very young population. According to BONVALET and TUGAULT 1984 in Ile-de-France the age group of 25-45 years corresponds to the period of family formation which means that the head of the household is necessarily a young person. According to PAMBE and PILON 2011, in Burkina Faso, the cumulative percentage of heads of households according to the age groups of [30, 39] and [40, 49] is 65.4% for men and 56.9% for women.

Compared to surveys on marital status, 75.17% of our respondents are married and the majority belong to the age group of 30 to 49 years. This result is higher than those found: by DIALLO and BARRY 2017 which found 60% of inhabitants married (monogamous or polygamous) and for the administrative region of Faranah 63.8% married; T.T. RAZAFIMIRANTSOA 2004, finds for Madagascar 62.4% of men and 64.5% of women in the age group of 30 to 34 are married, 67.1% of men and 74.0% of women for the age group aged 35 to 39; LOCOH and THIRIAT 1993 found For the same age groups in Togo, respectively 62.4% and 64.6% and 57.4% between 40 to 44 years old. Our result is a little below that found by PAMBE and PILON 2011, who obtained a percentage of 84.7% of married heads of household.

Compared to the level of study of our respondents, more than half (54.67%) are not educated, and only 7.03% have reached the higher level. This result is lower than the statistics of the General Population and Housing Census (RGPH) in Guinea 2014 where the illiteracy rate in Guinea is 68% and for the particular case of Faranah it is 77.7% in 2014. According to the ISU (UN Institute of Statistics) cited by MINGAT, et Al 2013, the illiteracy rate for people aged (15 years and over) is 62.0% for Guinea, for Burkina Faso 71.3%, for Senegal 57.4%, Ghana 34.2%, Togo 35%.

Of the profession of the respondents, 315 (75.18%) practice purely extensive agriculture which is the main basic socio-economic activity. This result is higher than that found by the FIDA (International Fund for Agricultural Development) Guinea Conakry 2020 team in its report on “the future of agriculture in Guinea: 2030-2063” which highlights that agriculture is the main sector of activity of nearly 67% of the Guinean population and employs 52% of the workforce. BAH et Al 2016 found for the city of Faranah 72.8% of the population practicing rainfed and extensive agriculture.

➤ *Household Knowledge of Plastic Waste Management*

On the reason for the use of plastics, we found a significant number of respondents 92.6% who say that the massive use of plastics is due to their low purchasing cost, 5.25% of our respondents mention the ease of use of plastics, 1.43% affirm that the use of plastics is due to modernity considering that transport and packaging objects are out of fashion. These considerations are shared by KABORE 2009 Page 38-39 who mentions that the massive consumption of plastic bags is explained by their low cost of access but also by their abundance on the market. Plastic is convenient and perceived as a fashionable object, this convenience of the plastic bag is linked to its size, its light nature which encourages its use.

On the origin of plastic waste, it is produced by households and constitutes a significant fraction of solid household waste (MSW) in the city of Faranah to the extent that it represents 20% of the total mass. This result is very close to BANGOURA 2017 which found 20% plastics in MSW in the city of Conakry. In the town of Dapaong in Togo, 20.71% of MSW is plastic according to AVOUGLA 2023. Another study conducted by CHARNAY 2005, page 15 finds the composition of MSW for the following countries: Burkina (10%), Guinea (22, 8%), Benin (3 to 4%) and Morocco (2 to 3%).

On the Causes of unsanitary conditions, the most cited 41.76% is the glaring lack of Pre-Collection structure, the only existing structure for the entire city only covers 20% of households. Added to this is poverty 19.57% because some say they cannot afford to subscribe to the Pre-Collection structure; illiteracy 15.51% and incivism 14.33% are also cited among the causes because some households are unaware of the harmful effects of unsanitary conditions and others lack awareness or are simply indifferent. These results agree with AVOUGLA 2023 which mentions the same case in the town of Dapaong in Togo where the lack of Pre-collection structure is one of the causes of unsanitary conditions, 33.72% of households are subscribed to existing structures; it also specifies that 58% of households are unaware and 33% of households are indifferent to unsanitary conditions. For the city of Ndjamena in Chad the subscriber rate is 33% according to WARI 2012 page 33.

The characteristics of plastic waste in the city of Faranah show that it is mainly composed of bags and packaging (78%). This result is higher than that of DAIROU et Al. 2020 which finds for the city of Garoua (Cameroon) page 217, 65% for all Sachets and packaging.

From the presence of trash cans and the types of materials used at the household level in Faranah, 87.29% have them compared to 12.41% who do not rely on trash cans. For public trash cans there are not enough, less than ten per neighborhood. 54% of the households encountered deposit waste in bins made of old containers, empty rice bags... this result is confirmed by BANGOURA 2017 page 358, which indicates that for the city of Conakry 46% of households deposit waste in old containers such as old basins, old buckets, old rice bags, etc. For the town of Vavoua (Ivory Coast), 63.38% of households put solid household waste in buckets or basins, 21.91 % put in bags and bags, finally 14.71% of all have no equipment for storing household waste at home COULIBALY et Al 2022 page 140.

When it comes to trash storage locations, 55% store them in a corner of the concession area, 38% say they are stored at the front of classes or at the start of classes, 7% store them in other places. This result converges in the same direction as that of COULIBALY et Al 2022, page 140 which approaches in the same direction by giving for the city of Vavoua (Ivory Coast), 56.62% of households store solid household waste in the courtyard, 41.57% at the front of the courtyards and 1.84% keep garbage in the kitchen.

From the frequency of emptying trash cans, we found 45.23% emptying every day of the week, 32.97% emptying waste several times a week, 21.80% emptying once a week. For the city of Vavoua (Ivory Coast), 38.61% of the total dispose of solid waste every day of the week, 31.61% and 25.37% respectively evacuate 3 and 2 times per week, 4.41% empty only once a week COULIBALY et Al 2022, page 140.

From places where trash cans are emptied, according to 65.67% of participants, they are dumped in empty spaces or vacant lots, 22.89% use streets and gutters, 8.72% dump into waterways and 2.72 % use conventional landfills. This very poor waste management in general is noted by BOKA 2020 which found for the Chic Cocody commune (Ivory Coast) that 58% of households throw solid household waste into wild dumps, 15% of households have their waste taken by collection trucks, 10% deposit in bins, 12% request Pre-collection services and 5% deposit near houses. The same situation is observed by AVOUGLA 2023, KOLEDZI and BABA 2014, SEGBEYA 2012 who affirm that populations use gutters, street rights-of-way, open spaces, gutters, streams and rivers to get rid of their household waste.

Regarding the use of plastic waste by households, the results of the surveys show that 66.11% of households do not know what to do with plastic waste and therefore do not make any use except to throw it away; 33.41% think that they should be burned, only 0.48% say that they are recyclable either by making paving stones, or by using them in agriculture to make plant nurseries. This state of affairs was observed by ADJALO et Al. 2020, HOUEDAKOR 2010 who support by saying that the individual and collective sanitation systems used in households do not offer

adequate treatment for plastic waste, except the transfer to a formal or informal dump, landfill or incineration.....

The waste management policy in general in Faranah is flawed by ignorance and non-application of legislative tests, the scarcity of sanitation services and materials, the lack of education and awareness of the population causing their low participation in healthiness. These remarks are shared by I. SANOH "Waste management strategies and methods for the city of Conakry" Page 5, who affirms that the public waste management service in Guinea suffers from a number of problems: underinvestment, low participation of the populations to health due to ecological incivility which does not speak its name, the absence of a national waste management strategy, the weakness of the regulatory framework and the lack of ecological education because the awareness campaigns often carried out are scattered and factual.

Regarding the solutions proposed to improve waste management in general and plastics in particular, the respondents' voices are divided: 30.7% demand strong involvement of the State by defining a better waste management strategy, and guarantee the laws in force, 25.77% encourage the distribution of sanitation materials, 19.33% think that SMEs should be encouraged, 18.86% are in favor of education and awareness to boost community participation, 5.97% opt for treatment. Many of his proposals are also cited by I. SANOH page 20-24 who emphasizes that it is necessary: the revision of legislation, the privatization of the sector, taxation and ecological education. As for BOURZAI 1998, page 6, he proposes decentralization in waste management, the development of local initiatives and community participation in waste management.

In relation to household knowledge on the Consequences of poor management of plastic waste, surveys carried out among households reveal the following findings: they affect human and animal health, impact agriculture, cause air pollution and water adds to these the ugliness of spaces and the living environment. These same impacts are reported by the West African Economic and Monetary Union (UEMOA) 2013 page 35-37, which underlines that the environmental impacts of plastic waste are of various orders: we note health extensions, distresses in the context of life and in urban landscapes, very negative repercussions in sanitation works, risks incurred by animals and in agriculture and a negative impact on the preservation of water resources.

➤ *Characterization of Plastic Waste Produced in Faranah*

The city of Faranah produces a total quantity of solid household waste (DMS) 36,500 tonnes/year of which plastics represent 20% or 7300 tonnes/year. This result is lower than the results of GBILIMOU et Al 2022; ALOUEIMINE Al 2006 who found 20% of plastics in MSW respectively in the city of Conakry (Guinea) and in Mauritania then MATEJKA et Al. 2001 found 22.8% for the city of Labé (Guinea).

The vast majority of its plastic waste contains bags and packaging, of which we found a cumulative rate of 62.5%, to which must be added bottles and other types of plastic which together represent 37.5%. This result is quite comparable to that of Dairou 2018 which finds for the city of Garoua (Cameroon) the following proportions: sachet-packaging (65%) bottle and others (35%).

The production of plastic waste increases as housing becomes more modern. This modernity of housing is in direct correlation with the standard of living. We found a daily production of plastic waste per inhabitant for a medium standard habitat is 0.56 Kg, for low standard 0.4 Kg and for a rural habitat 0.3 Kg. This result converges in the same vein. that COINTREAU, 2006, which attests that: “The higher the standard of living, the greater the consumption and the greater the production of waste”.

➤ *Method of Managing Plastic Waste in Faranah*

The diagram of the method of managing plastic waste in Faranah shown above shows disastrous management because only 12.5% is collected by an SME or the Town Hall services and sent to a conventional dump without any treatment, 0.5 % are recycled, everything else is either burned or thrown into vacant lots, in gutters, on streets, in waterways. This collection rate is much lower than in certain cities in African countries: Lomé (42%), Dakar (30 to 40%), N'Djamena (15 to 30%). Conakry (less than 15%)...which shows the inability of African public authorities to provide their population with effective management of household waste BANGOURA 2017.

V. CONCLUSION

This study focused on the management of plastic waste by households in the urban commune (UC) of Faranah and the variants of solutions allowing effective and sustainable management. The results of the surveys carried out showed that household solid waste (MSW) in general and plastic waste in particular are very poorly managed in the CU of Faranah, the management techniques are ineffective and harm the environment, human health and that of animals. The diagnosis made is as follows:

- The urban commune of Faranah produces a total quantity of 36,500 Tons/year of solid household waste (DMS) of which plastics represent 20%, i.e. 7,300 Tons/year, or approximately 20 Tons/day. The average production of plastic waste per person is 0.4Kg/day/inhabitant.
- The pre-collection rate for MSW including plastic waste is 85%.
- The remaining 15% is directly thrown away without spending any time in a trash can.
- Pre-collected waste has the following destinations: 22% is rejected in empty spaces, 11% is burned, 25% is found in the streets and gutters, 14% in waterways, 0.5% is recycled and end 12.5% are collected by the single SME in place sometimes with the town hall service and sent to a conventional landfill without any treatment.

By looking at alternatives to find a solution to the scourge, we have, with the collaboration of local populations and decision-makers, planned the plastic waste management service which will take into account the opinions of all stakeholders (participatory diagnosis), studies prerequisites and feasibility then the establishment of an action plan or a detailed project which will be implemented. In this project, a strategic framework for the management of plastic waste will be defined, to which we have proposed the rule of the three (3) Rs (Reduction, Reuse and Recycling).

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