

Sanitation, Pollution and Nuisance Control in the City of Sikasso, Mali

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Abstract: *Sikasso, a major trading and farming town in southern Mali, is growing faster than its sanitation services can keep up. This article looks at the state of sanitation in the town, at how the Regional Directorate for Sanitation and Pollution and Nuisance Control (DRACPN) carries out its work, at the obstacles it runs into, and at what residents think of it. We surveyed 50 residents across the 16 neighbourhoods of the urban commune, interviewed four officials from the DRACPN, the local sanitation service and the town hall, and in August 2026 visited drains, streams, waste dumps and the controlled landfill. Solid waste (44%) and wastewater (40%) are what worry residents most. Half of them put their rubbish in a bin, but 16% still use illegal dumps and 6% burn it. Half rate the cleanliness of the drains as no better than average, and 72% say poor sanitation affects their health or their surroundings. Environmental control is hard to see. Over half of those surveyed (58%) have never heard of the DRACPN, 54% say inspections are irregular, and none has ever seen a sanction. Two thirds (68%) think anti-pollution efforts achieve little or nothing. Officials, for their part, point to real progress, held back by too few staff, too little fuel and no wastewater infrastructure, and by residents' lack of civic-mindedness and reluctance to pay for waste collection. The DRACPN is doing its job, but only partly effectively. How well it does from here will depend as much on its resources as on residents' support.*

Keywords: urban sanitation; solid waste; environmental control; nuisances; Sikasso

1. Introduction

African cities are producing ever more waste and struggling to deal with it. According to the World Bank, sub-Saharan Africa generated 174 million tonnes of solid waste in 2016, a figure that could triple by 2050, and most of it still ends up in open dumps (Kaza *et al.*, 2018). Wastewater is hardly better handled. In 2022, 3.5 billion people around the world still had no access to safely managed sanitation (WHO & UNICEF, 2023). And yet the Sustainable Development Goals made sanitation (SDG 6) and healthy, sustainable cities (SDG 11) a priority (United Nations, 2015).

The human cost is heavy. The *Lancet* Commission on pollution and health put the number of premature deaths caused by pollution in 2015 at 9 million, one in six worldwide, the vast majority in low- and middle-income countries (Landrigan *et al.*, 2018). An update found much the same for 2019 (Fuller *et al.*, 2022). Poor sanitation spreads diarrhoea, cholera and malaria (WHO, 2018). Badly managed waste exposes both nearby residents and waste workers to a range of health risks (Cointreau, 2006). And where collection is lacking, people often burn their household rubbish in the open, filling the air they breathe with fine particles and toxic pollutants (Wiedinmyer *et al.*, 2014).

Studies of urban waste management in the Global South agree on one thing: the problem is not just technical. Guerrero *et al.* (2013) show that how well a system works depends as much on how services are organised and funded, and on whether households take part, as on equipment. Scheinberg *et al.* (2010) argue for governance that brings municipalities, private operators and users together. Wilson and Velis (2015) add that, without universal collection and controlled disposal, waste remains a global public health problem. More broadly, cities in low-income countries often grow faster than local authorities can provide basic services (Satterthwaite *et al.*, 2007; UN-Habitat, 2022). The sociology of public action makes a further point: an environmental rule is only worth as

much as the institutions that enforce it and the legitimacy it enjoys among citizens (Lascoumes, 1994).

Mali has no shortage of legislation. The 2023 Constitution gives everyone the right to a healthy environment. Law No. 2021-032 of 24 May 2021 covers the prevention and management of pollution and nuisances. Decrees passed in 2001 regulate solid waste, wastewater and faecal sludge, and a 2014 law bans non-biodegradable plastic bags (Republic of Mali, 2001, 2014, 2021). Putting these texts into practice is the job of the National Directorate for Sanitation and Pollution and Nuisance Control (DNACPN) and its regional directorates (DRACPN), set up in 2009 (Republic of Mali, 2009). Local authorities, meanwhile, are responsible for public hygiene. But there is still a wide gap between the law and what happens on the ground, and most of the research so far has focused on Bamako.

Sikasso, capital of the wettest region in the country, is a trading hub near the borders with Côte d'Ivoire and Burkina Faso. Its population is growing steadily and its built-up area is spreading fast. Secondary towns like this one have received little attention from researchers, even though a growing share of the urban population lives in them and they have far fewer institutional resources than the capital. We set out to understand how the DRACPN of Sikasso controls and manages pollution and nuisances as the town grows. The study had four aims: to identify the main sources of pollution and nuisances, to describe what the DRACPN does, to understand the difficulties it faces, and to set its work against residents' perceptions. Our working hypothesis was that rapid urbanisation, a lack of technical and human resources, and awareness-raising that still falls short together limit how effective environmental control can be in the town.

2. Methodology

2.1 The city of Sikasso

Sikasso lies in the far south of Mali, in a region bordering Burkina Faso, Côte d'Ivoire and Guinea (Figure 1). The land is fairly flat, a mix of plains and plateaus between 300 and 500 metres above sea level. The Sudano-Guinean climate brings 1,000 to 1,300 mm of rain a year, almost all of it between May and October. This rain is good for farming, but

it also leaves water standing wherever drains are too few or blocked. The urban commune has 16 neighbourhoods. Its population, which includes Senufo, Bambara, Minianka and Fulani people, keeps growing, drawn by the town's economic vitality and by migrants from other regions and neighbouring countries. The DRACPN office there has a Sanitation Division, a Control and Monitoring & Evaluation Division, and a communication unit. Its area of responsibility has shrunk since the 2023 territorial reform, which made Bougouni and Koutiala regions in their own right.



Figure 1: Map of the neighbourhoods of the urban commune of Sikasso

Source: Bakayoko et al. (2025)

2.2 Data collection

We combined a quantitative and a qualitative approach and then compared the results (Creswell & Plano Clark, 2018). The questionnaire went to 50 residents spread across the 16 neighbourhoods, three or four per neighbourhood. With no sampling frame available, the sample is not a probability sample: respondents were chosen so that every neighbourhood was covered, which does not guarantee statistical representativeness. The seventeen questions covered four themes: sanitation (waste management, collection, where waste is disposed of, the state of the drains), pollution and nuisances, environmental control (awareness of the DRACPN, how regular inspections are, sanctions), and how effective residents think the measures are.

For the qualitative part, we held semi-structured interviews with four officials: the regional director of the DRACPN; the head of the monitoring and evaluation service, who also runs the enforcement brigade; the head of the Service for Sanitation and Pollution and Nuisance Control (SACPN); and the third deputy mayor, who is in charge of sanitation, the living environment and urban planning. Other staff were away on assignment during the survey and could not be interviewed. Lastly, on 13 August 2026, we went round the town to observe and photograph drains, streams, waste

dumps, public spaces and the controlled landfill. Insecurity kept us out of some outlying areas.

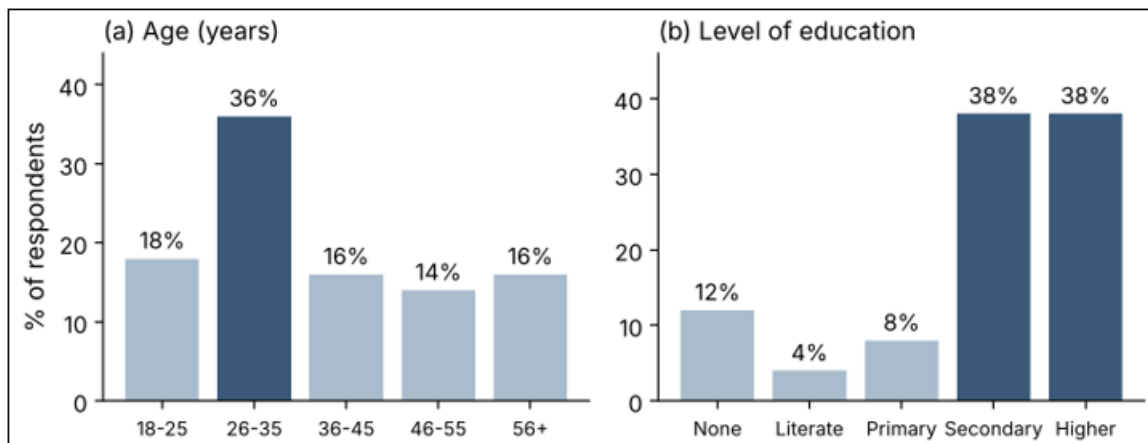
2.3 Data processing and analysis

Questionnaire answers were tallied as counts and percentages. Given how small the sample is and how it was put together, these figures should be read as trends in how residents see things, not as precise measurements for the whole town. The interviews were transcribed and analysed by theme (Braun & Clarke, 2006): mandates and activities, waste management, pollution and its causes, impacts, control, difficulties, effectiveness, and recommendations. Everyone interviewed gave their consent, and residents remain anonymous.

3. Results

3.1 Respondent profile

Men make up 72% of respondents. The 26–35 age group is the largest (36%), but every age group is represented (Figure 2a). The sample is fairly well educated: 38% have been to university and as many to secondary school, while 12% have had no schooling (Figure 2b). Traders (24%) and civil servants (22%) are the largest groups, followed by pupils and students (16%) (Table 1).

**Figure 2:** Distribution of respondents by (a) age and (b) level of education*Source: field survey, 2026***Table 1:** Sex and occupation of respondents

Variable	Category	n	%
Sex	Male	36	72
	Female	14	28
Total		50	100
Occupation	Trader	12	24
	Civil servant (incl. contract staff)	11	22
	Pupil or student	8	16
	Craftsperson	4	8
	Retired	3	6
	Farmer, unemployed	4	8
	Other (driver, homemaker, private sector, other)	8	16
Total		50	100

*Source: field survey, 2026***Table 2:** Waste collection and disposal site

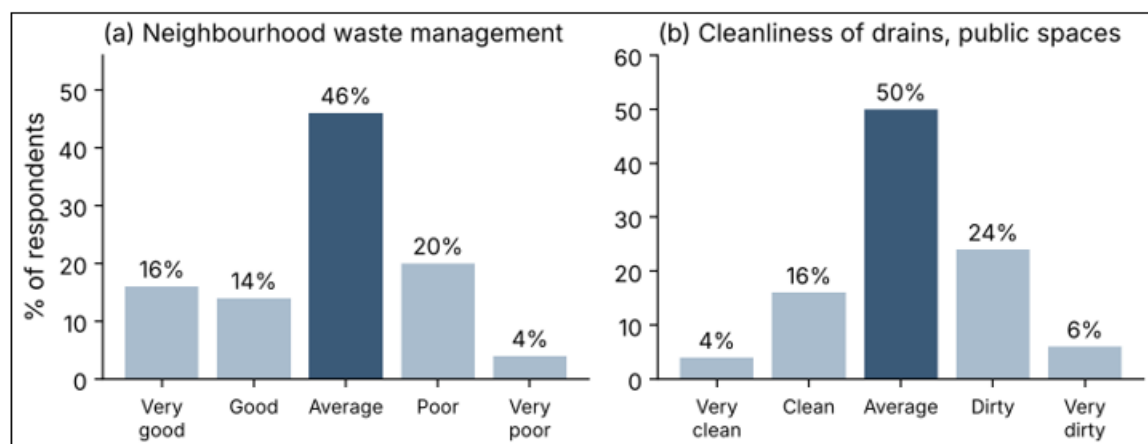
Variable	Category	n	%
Regular collection	Yes	26	52
	No	22	44
	Don't know	2	4
Total		50	100
Usual disposal site	Rubbish bin	26	52
	Transfer point	11	22
	Illegal dump	8	16
	Burning	3	6
	Other	2	4
Total		50	100

Source: field survey, 2026

3.2 State of sanitation as seen by residents

Residents have mixed feelings about how waste is managed in their neighbourhood. Nearly half call it average (46%), 30% good or very good, and 24% poor or very poor (Figure 3a). Just over half (52%) say collection is regular, but 44% say it is not (Table 2). Half of those surveyed put their rubbish in a bin and 22% take it to a transfer point. The rest fall back on solutions that cause problems: 16% use illegal dumps and 6% burn their waste.

Drains and public spaces draw much the same response. Half of respondents rate them as averagely clean, 30% find them dirty or very dirty, and only 20% clean or very clean (Figure 3b). On the ground, the contrasts are striking. Drains choked with soil and rubbish sit next to others that have been cleared, especially near the prefecture (Figure 6a). In Sanoubougou 1, a stream is slowly vanishing under plastic bags and refuse (Figure 4a). In several outlying neighbourhoods, rubbish piles up on vacant lots (Figure 4c).

**Figure 3:** Assessment of (a) waste management and (b) the cleanliness of drains and public spaces (n = 50)*Source: field survey, 2026*

3.3 Pollution and nuisances

Asked which type of pollution worries them most, residents put solid waste first (44%), then wastewater (40%), well ahead of bad smells (12%) and air or soil pollution (4%). Nobody mentioned noise (Table 3). Yet just over half (54%) say they put up with smells, smoke or noise. More importantly, nearly three quarters (72%) feel that poor sanitation affects their health or quality of life, and half of these say it affects them a lot.

Table 3: Pollution, nuisances and perceived effects

Variable	Category	n	%
Most worrying form of pollution	Solid waste	22	44
	Wastewater	20	40
	Bad odours	6	12
	Air and soil pollution	2	4
	Noise	0	0
Total		50	100
Exposure to odours, smoke or noise	Yes	27	54
	No	23	46
Total		50	100
Effect of poor sanitation on health or living environment	A lot	18	36
	A little	18	36
	Not at all	14	28
Total		50	100

Source: field survey, 2026



Figure 4: (a) Stream overrun by waste in Sanoubougou 1; (b) clogged drain; (c) illegal dump; (d) door-to-door pre-collection of refuse by an economic interest group (GIE)

Source: authors' photographs, 2026

3.4 Environmental control

Most residents have never heard of the DRACPN: 58% of respondents did not know it existed (Table 4). Over half (54%) say there are no regular environmental inspections in their neighbourhood, and 12% do not know whether there are any. The most striking finding concerns enforcement. Every single respondent says environmental laws are never obeyed, and none has ever seen a polluter punished.

Table 4: Perception of environmental control

Question	Response	n	%
Do you know the DRACPN?	No	29	58
	Yes	21	42
Total		50	100
Are inspections regular in your neighbourhood?	No	27	54
	Yes	17	34
	Don't know	6	12
Total		50	100
Are environmental rules complied with?	Never	50	100
Have you seen any sanctions?	No	50	100
How are pollution problems changing?	Decreasing	25	50
	Increasing	14	28
	Unchanged	11	22
Total		50	100

Source: field survey, 2026

3.5 Effectiveness and satisfaction

Over half of respondents (54%) think anti-pollution measures are not very effective and 14% think they are not effective at all, which makes 68% negative. Only 28% find them effective and 4% very effective (Figure 5a). Opinions of the authorities

are divided: 58% are not very satisfied or not satisfied at all, against 42% who are satisfied or very satisfied (Figure 5b). Oddly enough, half of respondents believe pollution problems are getting smaller, while 28% think they are getting worse (Table 4).

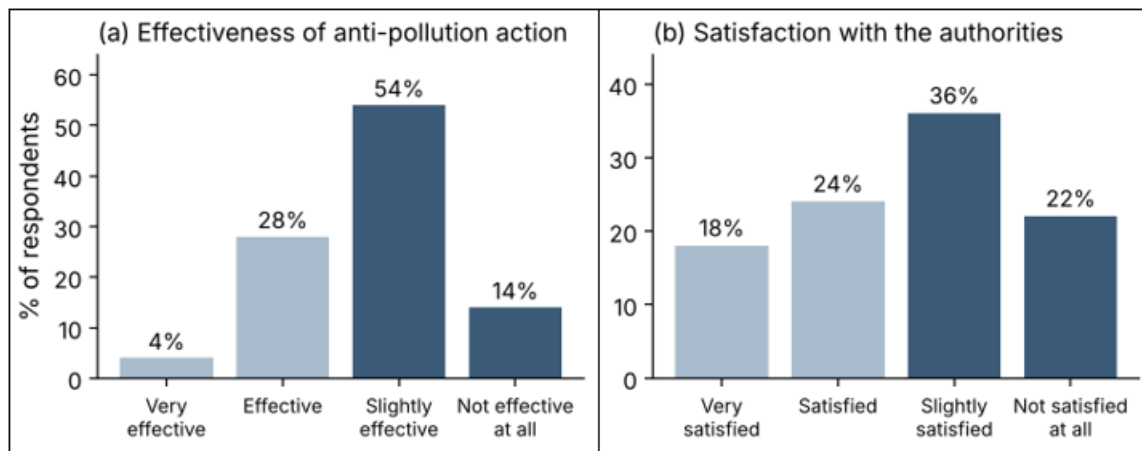


Figure 5: Assessment of (a) the effectiveness of anti-pollution measures and (b) satisfaction with the authorities

Source: field survey, 2026

3.6 What officials say

The four officials describe roles that complement one another (Table 5). The regional director of the DRACPN sums up his directorate's job as advising town councils, checking that the law is applied, reviewing environmental impact assessments and raising public awareness. The head of the brigade focuses mainly on mining and carries out audits. The head of the SACPN deals with solid, liquid and medical waste. The town hall employs the collection workers, provides the equipment and runs the town's controlled landfill together with the DRACPN (Figures 6b and 6c). Door-to-door collection is handled by economic interest groups, known as GIEs (Figure 4d).

All four agree that waste management has improved. The regional director points to the landfill, the growing number of subscribers and the four sites where faecal sludge can now be discharged. The deputy mayor goes as far as putting waste management "at around 70%" and says Sikasso is known as an especially clean town. But the same officials also admit to weaknesses. Many households refuse to sign up for collection, which keeps illegal dumps going. Wastewater is still an open problem: work on a sewer network began and

then stopped when the money ran out. In their eyes, pollution comes mostly from people's behaviour: a "lack of civic-mindedness", "indiscipline", rubbish and household wastewater thrown into watercourses. On top of this come dust from unpaved roads and the noise of generators during power cuts.

When it comes to consequences, the officials stress children's health. The regional director mentions diarrhoea in young children, swarms of mosquitoes, and periods of illness that leave families without income. The head of the SACPN adds respiratory illness, and the head of the brigade waterborne disease. All of them also describe damage to the natural environment. The deputy mayor recalls an awareness campaign held in Sanoubougou 1 because the local stream was disappearing under rubbish. The head of the brigade talks about lost biodiversity and natural resources under threat.

Enforcement relies on brigade patrols, in principle every Thursday, and on fines, a procedure that is the responsibility of the Regional Council. Everyone names the same difficulties: too few staff, too little money, fuel shortages, some residents and even some officers who do not know the regulations, and insecurity in certain areas. The head of the brigade told us that the regional director once had to pay for fuel himself so that the patrols could go out (Figure 6d).

Table 5: Summary of interviews with officials

Official	Role described	Difficulties cited	Recommendations
Regional director, DRACPN	Advisory support to town councils, control, impact assessments, awareness-raising	Staff, funding, infrastructure, lack of awareness of the law	Raise awareness, drain stormwater, enforce regulations
Head of brigade, monitoring & evaluation	Patrols, audits, monitoring of mining projects	Fuel, staff, lack of environmental education	Involve communities
Head of SACPN	Solid, liquid and biomedical waste; control	Non-compliance with regulations, fuel, insecurity	Training, funding, equipment
Deputy mayor	Collection, equipment, landfill management	Wastewater, refusal to subscribe, lack of civic-mindedness	Transfer points, equipment, subscriptions

Source: semi-structured interviews, 2026



Figure 6: (a) Cleaned-out drain near the prefecture; (b) entrance to the controlled landfill; (c) landfill storage cell; (d) brigade officer on patrol

Source: authors' photographs, 2026

4. Discussion

4.1 Contrasting views of the city of Sikasso

The sharpest contrast in this study is between how officials and residents see things. Officials speak of visible progress, a clean town and more subscribers. Two thirds of residents, on the other hand, think the measures taken achieve little or nothing. The two views do not necessarily contradict each other. Officials compare today with a few years ago and look at the town as a whole, especially its administrative centre, where the drains really are kept clear. Residents judge from their own street, their own drain, the illegal dump at the end of the road. That half of them think pollution is going down shows that some improvement is being felt. It is simply too uneven to win over the majority. Guerrero *et al.* (2013) found the same gap in many cities of the Global South, where efforts go into central, visible areas while the outskirts are left poorly served.

4.2 Solid waste and wastewater

Solid waste management has moved forward. The town has a complete chain, from door-to-door collection by GIEs to a controlled landfill, which not every Malian town can say. The weak point comes at the very start of the chain, with household subscriptions. As long as some families refuse to pay for collection, whether because they cannot afford it or out of habit, illegal dumping and burning will carry on. This is a familiar pattern. Scheinberg *et al.* (2010) show that collection coverage depends largely on whether users can pay and whether they trust the service. Kaza *et al.* (2018) note that

much of the waste in sub-Saharan Africa is still never collected at all. Burning, which 6% of respondents admit to, is far from harmless, since it releases particles and toxic compounds right into residential areas (Wiedinmyer *et al.*, 2014).

Wastewater is a bleaker story. It comes just after solid waste in residents' concerns, and officials admit there is still no proper infrastructure for it. The sewer network that was started and then abandoned for lack of funds says it all. In a climate where more than a metre of rain falls each year, stagnant wastewater mixes with rainwater, blocks the drains and gives mosquitoes a place to breed. Mara (2003) pointed out long ago that wastewater treatment is the poor relation of sanitation in developing countries, even though public health depends on it. The diarrhoea and malaria the officials describe are the direct result (WHO, 2018).

4.3 Pollution and nuisance control

Every respondent says they have never seen a sanction, and 58% do not know the DRACPN. This finding needs careful reading. It does not prove that there are no inspections: the brigade does go on patrol, and officials describe a procedure for issuing fines. What it does show is that, for much of the population, this control simply cannot be seen. A rule that nobody sees being enforced loses its power to deter. Lascoumes (1994) observed that an environmental policy rests as much on its legitimacy and visibility as on its legal content. Mali's legal framework is now complete, from the Constitution down to the 2021 law. Where it breaks down is

enforcement, which depends on a handful of officers who can only go out when there is fuel.

This lack of visibility feeds a vicious circle. Since they never see anyone punished, residents conclude that the rules do not apply, and some keep throwing rubbish into drains and streams. Officials, in turn, blame pollution on residents' "lack of civic-mindedness". Each side holds the other responsible. Breaking out of this circle means making public action easier to see: telling people about the inspections carried out, publishing the sanctions handed down, and explaining in the neighbourhoods what the DRACPN does.

The stream in Sanoubougou 1 is a case in point. The plastic bags clogging it have been banned since the 2014 law on non-biodegradable bags. Yet they are everywhere in the town's markets and shops. The ban exists on paper, but with no checks on sales and no cheap alternative, it has not changed what people do. Raising awareness among the people who live along the stream, as the town hall has done, is still worthwhile. But it will not be enough as long as plastic bags remain the cheapest and easiest packaging to get hold of.

4.4 Resources and mandates of the DRACPN

The DRACPN of Sikasso has a long list of tasks: advising local councils, reviewing impact assessments, monitoring industrial and mining pollution, keeping an eye on urban sanitation and raising awareness. To do all this, it has a small team, some of whom were away on assignment during our survey, and a budget that does not always stretch to fuel for the patrols. Sikasso is not an isolated case. Satterthwaite *et al.* (2007) and UN-Habitat (2022) describe urban services in fast-growing cities whose needs grow faster than their resources. Our results therefore bear out all three parts of our initial hypothesis: human and material resources are lacking, urbanisation is putting services under strain, and awareness-raising, though it does happen, is not enough to change behaviour for good.

Insecurity adds a constraint specific to Mali today. Officers find some parts of the region hard to reach, and we ourselves could not get to certain areas. This limits oversight of risky activities, especially mining, and makes it harder to form an overall picture of the region's environment.

4.5 Avenues for action

Several courses of action stand out. The first is about resources: a guaranteed operating budget for the DRACPN, especially for fuel and brigade equipment, would allow regular patrols. The second is about wastewater: restarting the stalled works and drawing up a sanitation master plan for the town look like priorities, all the more so as stormwater drainage is bound up with the same issue. The third is about collection: more transfer points in the neighbourhoods that lack them, and subscription fees that poorer households can afford, would cut down on illegal dumping. The fourth is about making public action visible: making the DRACPN better known, publishing inspection results and actually applying the sanctions set out in the 2021 law. Finally, awareness campaigns would work better if they relied on

neighbourhood chiefs, youth and women's associations and schools, rather than on one-off events.

5. Conclusion

We wanted to understand how the DRACPN of Sikasso controls pollution and nuisances in a fast-growing town. The answer is mixed. The DRACPN does carry out its mandate: it advises the town hall, inspects, raises awareness and helps run the landfill. Officials describe real progress in solid waste management, and half of residents can see things improving. But its work goes largely unseen, held back by a shortage of staff, fuel and infrastructure, and undermined by habits that die hard. Wastewater remains the town's biggest problem. Most residents still think little is being achieved, and nobody has seen a sanction applied.

Improving living conditions in Sikasso is therefore not a matter for the technical services alone. It calls for resources that match the scale of their mandate, a sewer system for wastewater, a collection service every household can afford, and public action that people can actually see. It also needs residents on board, and they will only come on board if they see real results in their own neighbourhood. Future work could measure water and air quality, survey a larger and more representative sample, and compare Sikasso with other secondary towns in Mali.

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