

# GLOBAL INFORMATION SOCIETY WATCH 2020

*Technology, the environment and  
a sustainable world: Responses from  
the global South*



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)  
AND SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY (SIDA)

## Global Information Society Watch 2020

Technology, the environment and a sustainable world: Responses from the global South

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# CONGO, DEMOCRATIC REPUBLIC OF

## MAKING LAMPS FROM PLASTIC AND ELECTRONIC WASTE IN BUKAVU



**Mesh Bukavu**

Pacifique Zikomangane

### Introduction

Poor waste management has serious consequences for the environment in the Democratic Republic of Congo (DRC). Although all cities in the country face the same problems, this report focuses specifically on the city of Bukavu, a city located on the shores of Lake Kivu in the eastern part of the country. Biodegradable and non-biodegradable wastes are visibly stored in several places in Bukavu where there is no waste management policy, which is at the root of the serious consequences to the environment.

Among these consequences are the pollution of the waters of Lake Kivu and the clogging of sewage and rainwater drains. When the pipes are blocked, rainwater turns into a flood and washes away everything it comes across, including vehicles, houses and people.

In this report, I am going to talk about an initiative by young people in Bukavu who have set up a project called “Kwanza Technologies”,<sup>1</sup> which recycles plastic and electronic waste to produce lamps. It is a startup using technology to protect the environment against pollution and damage caused by plastic and electronic waste.

### When the environment gets angry, it is humans who suffer

The good management of waste for the protection of the environment and health is an obligation incumbent on the Congolese state under the terms of Article 56 of legislation on the protection of the environment in the DRC.<sup>2</sup> However, this provision is not always respected throughout the country and especially in Bukavu. Like most cities in the DRC, Bukavu does not have a wastewater treatment centre or a solid waste treatment centre. The Congolese administration has appointed sanitation agents in all the cities of the country,

but they lack both the means and training to do effective work.

The population in Bukavu is constantly increasing, and is now estimated to be 1,078,000 inhabitants.<sup>3</sup> Several reasons can explain this increase. A key one is the insecurity in the surrounding villages and the poverty of rural households which has resulted in a migration to urban centres. This has led to an increase in waste production in the cities, and an unplanned expansion of makeshift homes.

People come to settle on fragile sites, sometimes unsuitable for construction, with serious consequences in terms of erosion and the collapse of houses, often resulting in death. Eleven people died after being buried in a landslide in Bukavu on 20 July 2020 during earthworks on a plot of land. Similar scenes are regularly recorded in the city. In January 2020, 13 more people died in one day, some swept away by the water, others buried by a landslide.

As the population in the city increases, so does the waste and environmental damage. Water pipes are clogged, houses are washed away and the waters of Lake Kivu are polluted. Plastic waste is the most visible in the lake waters, while electronic and metal residues mixed with plastic packaging are stuck in drainage pipes, preventing the normal evacuation of water from the city. The subsequent flooding eventually carries away people and houses.

The national electricity company, SNEL, is also a victim of the poor waste management in Bukavu. Not having access to public garbage bins, the inhabitants throw their unsorted waste into drainage pipes, and when it rains all this waste is washed not only into Lake Kivu but also into the hydroelectric power station installations located on the Ruzizi River. Besides Bukavu, this power station serves rural areas and neighbouring countries like Rwanda with electricity. The trapped waste in the SNEL hydroelectric power station installations disrupts their operation, which is at the root of the disturbances in the supply of electricity to the city's inhabitants, who can go for days without electricity.

<sup>1</sup> Kwanza is a Kiswahili word which means first, so Kwanza technologies means first technologies.

<sup>2</sup> <https://medd.gouv.cd/loi-n-11-009-du-09-juillet-2011-portant-principes-fondamentaux-relatifs-a-la-protection-de-lenvironnement>

<sup>3</sup> <https://www.macrotrends.net/cities/20850/bukavu/population>

## Non-biodegradable waste energy sources

Kwanza Technologies is a startup created by a group of young electronic engineers in the city of Bukavu. Since 2015, it has manufactured lamps from plastic and electronic waste. This startup has three objectives: firstly, to protect the environment; secondly, to create jobs for young people; and thirdly, to give the population access to energy. According to SNEL, only 15% of the Congolese population has access to electricity (but with “load shedding” or planned blackouts), while 85% of the population is completely in the dark.<sup>4</sup>

Finding themselves in a city where electric current is almost non-existent, and at the same time facing the problem of waste, these young people decided to make rechargeable lamps as their main product. Kwanza Technologies wants to be a solution to two major problems in the city of Bukavu, namely the lack of electrical power and the unhealthy environment. To do this, the young people of Kwanza Technologies travel all day long through Bukavu’s dumpsites and garbage cans to collect plastic and electronic waste and turn it into a source of energy. It is mainly plastic containers, old batteries and other electronic waste in the landfills that attract the young people’s attention. Then they take this waste back to a makeshift workshop where they recover components that are still usable, and from which they make the electrical circuits necessary for the manufacture of the lamps.<sup>5</sup> The plastic waste is mainly used to make the lamp casings.

The lamp manufactured by Kwanza Technologies is called Kibidon. It provides 42 hours of non-stop lighting after a 10-hour charge. It has two main features that constitute its two advantages. The Kibidon lamp can be recharged easily, whether using solar or electrical power. Once charged, the lamp can also be used as an energy bank, offering the possibility of charging phones in the absence of electric power. This lamp is not only used in households and hospitals, but also by artisanal miners, students and traders. Although still not well known in the city, the startup has already manufactured more than 700 lamps since 2017 and sold more than 600 to date for USD 20 each.

The startup is now attracting financial backers. During a festival organised in the nearby city of Goma in February 2019, Kwanza Technologies received the support of Rawbank, granting it USD

2,500 for the development of the Kibidon. This sum enabled the company to increase its production capacity to 20 lamps per day.<sup>6</sup>

## Kibidon is both a solution and a problem

Although praised by its initiators, the startup is far from being a solution to the problems of a lack of electricity and excess waste in the city of Bukavu. If plastic and electronic waste are collected from the garbage, we think it is important to point out the problems with the initiative.

So far, Kwanza Technologies has no waste management policy. Not all waste is collected during the collection stage. For example, when it comes to plastics, of all the different kinds of plastic waste in the city’s garbage bins, Kwanza Technologies’ collectors only pick up plastic containers, and leave the rest on site. The same is true for electronics: only those that can still be used to make their products are collected.

Not all of the waste that has been collected and brought back to the workshop is used, which means that some of it is thrown away by the startup. The lamps manufactured and sold do not have an indefinite life, which means that at the end of their use, they end up in the same garbage cans and public dumps with less chance of being taken back by Kwanza Technologies’ collectors to be recycled again. The collection and sorting of waste is also done manually without any protective measures in place, which exposes the collectors to the risk of coming into contact with harmful products during collection.

As for access to the product, it should be noted that despite the planned reduction in price in favour of large quantity buyers, the price of USD 20 for a Kibidon lamp is relatively high compared to the income of the population. Bukavu is located in the province of South Kivu where the average monthly per capita income is estimated at USD 17.<sup>7</sup>

Despite these few negative aspects I have just raised in the manufacturing process of Kibidon lamps, the initiators of the startup remain confident about the future of their project. They plan to recycle about 40 tons of plastic waste and five tons of electronic waste per year and intend to replicate the same project in other cities in the DRC. This is a difficult bet to win, since not all plastic and electronic waste is collected by the project.

4 Statement by Eric Mbala during a student awareness day on energy development strategies for the DRC on 8 July 2016, in Kinshasa.

5 Interview of Yves Casinga, initiator of Kwanza Technologies, with the author on 3 July 2020 in Bukavu.

6 Ibid.

7 [https://www.cd.undp.org/content/dam/dem\\_rep\\_congo/docs/povred/UNDP-CD-Profil-PROVINCE-Sud-Kivu.pdf](https://www.cd.undp.org/content/dam/dem_rep_congo/docs/povred/UNDP-CD-Profil-PROVINCE-Sud-Kivu.pdf)

## Conclusion

The manufacture of chargeable lamps through waste recycling by young people is an expression of their commitment to environmental protection on the one hand and job creation on the other. However, this dual commitment should not prevent any observer from taking a critical look at it. For example, there are limitations to the product, including that it cannot yet power household appliances, such as a kettle or toaster – its charging capacity is limited to mobile phones. Due to its high price, the Kibidon lamp is also only accessible to people with sufficient means, to the disadvantage of the majority with an average income.

The Kibidon lamp is far from being a panacea to the problem of waste, the lack of electricity and even less to the problem of youth employment in the city of Bukavu. Nor can we expect it to be.

It is a project to manufacture lamps, and only contributes a small part to general waste recycling. One only has to travel around the city to see how garbage of all kinds is still flooding rubbish bins, public dumps and avenues, despite the existence of this project.

Nevertheless, there is room for the project to develop a proper in-house waste management policy, to expand its waste collection activities, and to develop environmentally sound disposal plans, given that not all waste collected is reused.

Startup projects like these can't do it all on their own, but with the correct plans in place, and possibly with government support, they can help

to make a much bigger impact on waste management in a city like Bukavu, and on the environment more generally. In this regard, the project stands as an interesting example of how we should not evaluate innovative recycling and reuse initiatives in isolation of the context in which they work, and the impact the projects themselves might have on the environment.

## Action steps

The following steps are recommended to make the impacts of the waste reuse project in the city of Bukavu visible:

- Kwanza Technologies needs to extend recycling to all categories of electronic and plastic waste to ensure that all garbage cans and public dumps are emptied of non-biodegradable waste to protect the environment.
- The price of a lamp needs to be lowered, to meet the buying power of a low-income population.
- The government should support Kwanza Technologies by granting it subsidies that could enable it to modernise its recycling system so that it can take in all categories of plastic and electronic waste. Subsidies would also help lower the price of its product.
- The government should also support waste recycling initiatives by establishing a waste separation system that will separate biodegradable from non-biodegradable waste in garbage cans and landfills.

# *Technology, the environment and a sustainable world: Responses from the global South*

The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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2020 Report

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