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Waste Management, Plastic Pollution and Circular Economy. Constraints and Challenges in the Case of Mozambique

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Kaha Mohamed Aden, Luciano Ardesi, Gianmarco Cavallarin, Simona Cella, Aldo Cera, Fabrizio Corsi, Antonio Dalla Libera, Tatiana Di Federico, Nelly Diop, Mario Giro, Lorenzo Luatti, Umberto Marin, Marta Meloni, Gianluigi Negroni, Beatrice Orlandini, Giulia Paoletti, Blaise Patrix, Massimo Repetti, Raphaël Thierry, Flore Thoreau La Salle

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Direzione e redazione
Via Gamberi 4 - 40037
Sasso Marconi - Bologna
tel. +39 051 840166 fax +39 051 6790117
redazione@africaemediterraneo.it
www.africaemediterraneo.it

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Andrea Giovanelli

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Detail of garment label by the upcycling Ghanaian brand Slum Studio, based in Accra.
http://www.theslumstudio.com/
Photo by Tora San Traoré

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Waste Management, Plastic Pollution and Circular Economy. Constraints and Challenges in the Case of Mozambique

As a result of the population growth and substantial changes in consumption patterns, Mozambique has been facing increasing difficulties in the area of waste management. After a comprehensive review of the country's regulations and policies, the author argues that any solutions in this field should rely on effective education, training and awareness measures.

by Carlos Manuel dos Santos Serra

The exponential production of waste and its elimination or improper disposal are determinant causes of low environmental and public health quality in many regions and human settlements worldwide. They are responsible for air, soil and water pollution (including that of oceans, rivers, lakes and underground aquifers), and for damage to biodiversity and to society and the economy itself.

The problem is particularly pressing with regard to plastic, one of the most important, powerful and multifaceted materials invented by humans (UNEP 2018). The exponential increase in its production, consumption and disposal is currently a matter of growing concern, following the studies carried out on the damage it causes to ecosystems, marine and coastal biodiversity and the presence of micro-plastics in human beings.

This article deals with waste management, plastic pollution and the challenges of implementing a circular economy approach in Mozambique, as opposed to the classic linear economy, based on the primary exploitation of natural resources and the production of waste.

Fundamentally, it aims to analyse what should be done to strengthen waste management approaches and to prevent and combat plastic pollution, especially at the local level (municipalities and districts), with a focus on building a circular economy system.

Waste management in the World and in Mozambique

According to Kaza et al. (2018: 1),

> solid waste management is a universal issue affecting every single person in the world. Individuals and governments make decisions about consumption and waste management that affect the daily health, productivity, and cleanliness of communities. Poorly managed waste is contaminating the world's oceans, clogging drains and causing flooding, transmitting diseases via breeding of vectors, increasing respiratory problems through airborne particles from burning of waste, harming animals that consume waste unknowingly, and affecting economic development such as through diminished tourism.

The population of the African continent has grown at a quicker rate than any other region on the planet and projections indicate that the total population is expected to grow by 105%, or approximately double, from 2015 to 2050, while the urban population is expected to grow by 284%, or approximately triple, over the same period (United Nations 2014). The amount of solid waste is also expected to increase in step with the population growth, with an approximate projected three-fold rise from 174 million tons in 2016 to 516 million tons in 2050 (Kaza et al. 2018).

The impacts on the environment, on public health and on the economy resulting from deficient waste management

Katembe beach. Photo by Carlos Serra

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According to World Wildlife Fund, humanity generates approximately 400 million tons of plastic waste each year and more than 100 million tons are found in nature annually. If nothing is done, the quantity accumulated in the ocean could double by 2030, reaching 300 million tons.

are well documented and require integrated attention and action by governments, companies, partners and communities (African Clean Cities Platform 2019).
Mozambique has been experiencing rapid exponential population growth, urbanisation and waste production (INE 2017). Among the various environmental problems in the country, the pollution generated by waste has drawn the attention of the authorities engaged in the incorporation of prevention and response measures through political, legislative and institutional instruments.

The threat of plastic pollution

Plastic pollution is currently the main focus of attention when discussing solid waste management. Only 9% of the nine billion tonnes of plastic the world has ever produced has been recycled. Most ends up in landfills, dumps or in the environment (UNEP 2018). The flow of plastic into the oceans is projected to nearly triple by 2040. Without considerable action to address plastic pollution, 50kg of plastic will enter the oceans for every meter of shoreline (Pew Charitable trusts & Systemiq 2020).
According to World Wildlife Fund, humanity generates approximately 400 million tons of plastic waste each year and more than 100 million tons are found in nature annually. If nothing is done, the quantity accumulated in the ocean could double by 2030, reaching 300 million tons (WWF 2019: 12).
Pollution generated by plastic waste has been increasing in Mozambique, especially from single-use items, with a focus on urban centres, communication routes and sensitive ecosystems under human influence. Among the plastic items, single-use items stand out including plastic bags, PET packaging, disposable cups and cutlery, insulated packaging and candy and snack packaging. These have been found in increasing quantities during monitoring and cleaning actions of beaches.
In Mozambique, as reported by IUCN (2020), the packaging sector contributes to more than 70% of the total plastic leakage, with approximately 12,900 tonnes of packaging discharged into the ocean in 2018.

Political and legal framework

In the light of this, a political and legislative framework was approved at the central level, with a view to responding to the challenges mentioned above. It should be noted that since Mozambique's participation in the historic United Nations Conference on Environment and Development (Rio de Janeiro, 1992), a process for the approval of political, legislative and institutional instruments in the area of the environment has begun.

a) National Environmental Policy

In 1995, the *National Environmental Policy* was approved, which defined the bases for the sustainable development of Mozambique, aimed at the progressive eradication of poverty and the improvement of the quality of life of Mozambicans, as well as the reduction of damage to the environment. This policy addresses the management of the urban environment, including the management of solid domestic and hospital waste. It is said that "a correct management of domestic and hospital solid waste in national urban centres lacks the existence of an adequate technical capacity of the municipal councils", for which the strategy was defined: "to train municipal councils in the areas of waste management domestic and hospital solids, with a view to improving the system for collecting, depositing and treating waste". Among the immediate activities are: (i) "creating and managing, conveniently, new dumps, introducing solid waste treatment and recycling systems"; (ii) and "progressively introducing mechanisms for the practice of separation of domestic solid waste in city dwellers". Last but not least, is the title of activity in the medium and long term – "adopting legislative measures that oblige polluters to proceed with the recycling of their waste".
In the field of environmental education, the *National Environmental Policy* defined its objective as, among others, "the development of an environmental awareness among the population, in order to enable public participation in environmental management".
After about 25 years of the *National Environmental Policy*, in our opinion, a significant part of its contents remains current, valid and necessary, however with little implementation.

b) Integrated Solid Waste Management Strategy in Mozambique

At a political-legal level, the *Integrated Urban Solid Waste Management Strategy in Mozambique* was approved by the Ministry for the Coordination of Environmental Action, in 2012, for a twelve-year time frame, with this purpose:

> Until 2025, municipalities, villages or population agglomerations will clean and engage in the creation of favourable conditions for the management of urban solid waste, attributing responsibilities to the different stakeholders for the minimization of the impacts resulting from the waste, with emphasis on the public and private sectors and society in general, ensuring application the principle of the 3Rs and the hierarchization in the management of urban solid waste, which includes the reduction of solid waste production, treatment and final disposal.

The degree of implementation of such activities turned out to be, in general, quite low, the same being said about the medium-term (2017-2020) and long-term (2021-2025) activities. In short, the strategy focused not only on the most basic aspects of urban solid waste management (including the degree of coverage, the key organisation, the elimination of pollution sources, etc.), but also defined the bases for the creation of a wastewater and waste recovery system.

c) Environmental Law

The *Environmental Law* (Law No. 20/97, of October 1st) aims to define the legal bases for the correct use and management of the environment and its components, with a view to materialising a sustainable development system in the country

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Polana beach. Photo by Carlos Serra

(article 2), aiming, among other aspects, to contribute to the prevention and fight against pollution in various ways. It includes a general clause prohibiting pollution outside the legally established limits, as well as a ban on the import into the national territory of hazardous waste, with the exception of what is established in specific legislation (article 9). It also foresees a clause prohibiting "trash or used materials" that may have significant negative impacts on the environment, especially in "coastal zones, areas threatened by erosion or desertification, wetlands, environmental protection areas and other ecologically sensitive areas" (article 14).

d) Regulation on Urban Solid Waste Management

The *Regulation on Urban Solid Waste Management* (approved by Decree No. 94/2014, of 31 December) contains several important aspects that, if implemented, would contribute to radically change the current situation in the country. Note that the legislator enshrined, among others, the principle of the hierarchy of waste management, under which the management of urban solid waste must respect an order of priorities in relation to management options: (i) prevention and reduction, (ii) reuse, (iii) recycling, (iv) other forms of recovery and (v) disposal. Waste management "should always resort to the best available technologies at economically sustainable costs, in order to extend the life cycle of materials" (article 4). In other words, the entire approach was fundamentally centred on prevention and, successively, on valorisation, with elimination as a last resort. It is, without a doubt, a step forward in laying the foundations for a circular economy system. For this purpose, local bodies (municipal councils and district governments) are given a key role in implementing the principle of waste management hierarchy.
It is incumbent upon such institutions, within their respective area of jurisdiction, among other aspects, to: (i) ensure the adequate management of urban solid waste; (ii) prepare and approve municipal ordinances and regulations on urban solid waste and urban sanitation, as well as other specific norms on urban solid waste management; (iii) define the procedures for the collection, transport, treatment and final destination of urban solid waste; (iv) and promote good urban solid waste management practices (article 5). It means that each of the 53 municipalities and 154 districts of the country must prepare specific legislation on the management of urban solid waste, considering the reality of each location, and in compliance with the bases defined in the aforementioned national regulation. Furthermore, such bodies must also ensure that waste is not thrown onto beaches, into the sea, courses and bodies of water, or other places that may pose a danger to public health and the environment. They must also ensure that waste is not deposited or burned in the open or using facilities and equipment not licensed for that purpose (article 6).

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Finally, an important transitory rule was included in the regulation, according to which "municipal councils or non-municipalised towns must close open dumps in their areas of jurisdiction and guarantee the construction of sanitary or controlled landfills within three years after the publication of these regulations" (article 25). This reflected a great concern to protect the environment and safeguard public health. However, reality revealed that during the 6 years in which the Regulation was in force, none of the municipalities and districts closed the existing open-air dumps and started the construction of controlled or sanitary landfills.

e) Regulation on the Management and Control of Plastic Bag

At the beginning of the mandate of the Ministry of Land, Environment and Rural Development (2015-2019), the problem of pollution generated by plastic bags deserved attention, bearing in mind the escalation of impacts on the environment, health, landscape and infrastructure. The Government, through Decree No. 16/2015, of 5 August, approved the *Regulation on the Management and Control of Plastic Bag*, seeking to establish rules and procedures regarding the management and control of plastic bags in terms of their production, import, marketing and use, with a view to reducing their negative impacts on human health and the environment in general (article 2).

This regulation determined the prohibition of the production, import, retail or wholesale marketing of plastic bags whose thickness is less than 30 micrometres, the free distribution of plastic bags in all places where commercial activity is carried out, and the marketing or distribution of plastic bags containing over 40% recycled material in establishments that sell food products (article 4).

However, as confirmed in subsequent years, after a relative initial success in implementation, pollution from plastic bags grew again, due to the lack of alternatives, weaknesses in inspection and bearing in mind the fact that informal trade has remained practically on the side-lines of the regulation. A study on plastic pollution along the coast of the province and city of Maputo concluded, among other things, that plastic bags have reappeared in abundance in the environment, ranking top of the list of plastic objects most found on urban beaches in the region (Serra, Carvalho & Abacassamo 2020).

The new Ministry of Land and Environment (2020-2024) decided to proceed with the revision of the regulation, putting forward the proposal to ban plastic bags across the national territory, considering the balance carried out over the five years of implementation, which culminated in the observation of the failure to pursue the intended objectives when that legal instrument was approved. However, the debate around possible prohibitive or restrictive measures in the context of combating plastic pollution has been centred, on the Government side, in a single article - plastic bags used in commerce. The other single-use articles remain devoid of any kind of approach. However, the issue of plastic pollution goes far beyond the pollution caused by plastic bags, encompassing a whole variety of single-use plastic items, as demonstrated in the study above, as well as the monitoring carried out by the same organisation in subsequent times. PET bottles, sweets and snack packaging, polystyrene packaging and disposable cups and cutlery are also included in the list of the most commonly found items on urban beaches, revealing the deficiencies in upstream waste management (Serra, Carvalho & Abacassamo 2020).

f) Regulation on the Extended Producer and Package Importer Responsibility

However, given the need to "adopt principles, standards and guidelines for the accountability of packaging producers and importers, with a view to protecting the environment and public health, within the framework of the objective of sustainable development", including plastic packaging, the Government approved the *Regulation on the Extended Producer and Package Importer Responsibility*, with Decree No. 79/2017 of 28 December.

The principle of "extended producer" and "importer responsibility" basically consists of attributing, in whole or in part, physically and/or financially, the responsibility for the impact on public health and the environment to the producer and importer of packaging and packaging waste (article 4). In this sense, producers and importers are jointly responsible for the management of packaging and packaging waste pursuant to the provisions of this regulation and other applicable legislation, including the payment of fees for the management of packaging provided for in this regulation, as well as the return and recovery of packaging waste, either directly or through organisations that have been created to ensure the recovery of recovered materials (article 7).

This regulation provides for three systems of responsibility of the producer and importer of packaging, which can be implemented in a combined manner, namely: (i) internal management systems (direct and indirect); (ii) packaging environmental tax systems; (iii) and packaging standardisation systems (article 9).

With one of the objectives underlying its approval the fight against pollution generated by plastic packaging, the regulation has not yet been implemented, for reasons that are unclear.

In the absence of investment in community education and awareness actions, for the vast majority of people waste management is limited to the act of taking it far away, either to be buried, burned, dumped or disposed of in containers or locations identified by municipalities and districts.

The failure to insist on downstream solutions in waste management

One of the critical aspects of waste management in Mozambique is the focus on downstream rather than upstream intervention. That is, the preference of final destination solutions (e.g. the construction of sanitary landfills or controlled landfills, as well as the acquisition of means of transport of waste to dumps or handling machinery) to the detriment of environmental education initiatives, prevention, reduction or recovery of waste (reuse, recycling, composting or energy recovery).

The analysis of the Government's five-year programmes, for example, is a paradigmatic example of this thinking model. The programmes are limited to including, in the field of waste management, the forecast of the construction of sanitary or controlled landfills as an alternative to open-air dumps. In the Government's Five-Year Programme 2020-2024, three controlled landfills were considered for the cities of Nampula, Beira and Pemba, with nothing being said in relation to investment in circular economy systems (Assembly of Republic 2020).

At the level of municipalities and districts, the scarce investment in the area of waste management is used for generic garbage containers (which do not separate the waste), for transport to take the waste to open dumps and the maintenance of the dumps, as well as for the human resources needed to guarantee the basic functioning of such services. The focus is not, therefore, on reduction, prevention or enhancement, but on a final destination that passes through elimination. This translates the old paradigm of garbage in common language being something undesirable or useless that is only intended to be thrown away. In the absence of investment in community education and awareness actions, for the vast majority of people, waste management is limited to the act of taking it far away, either to be buried, burned, dumped or disposed of in containers or locations identified by municipalities and districts. Garbage is therefore not a value which can be capitalised on from home or sold to recycling operators.

Notwithstanding the provisions of the *Regulation on Urban Solid Waste Management*, which gave municipalities and districts the responsibility to approve the selective collection system, the reality reveals the undifferentiated treatment of waste which significantly hinders the action of organisations, communities and individuals operating in the field of recovery. In the country, the linear economy system still dominates.

Structural weaknesses affecting waste management systems in Mozambique contribute to increasing marine pollution. Open-air drainage ditches, collectors and other water outlets are facing out towards the sea, without any solid waste retention device. In the period between March 2020 and June 2021, the monitoring team of the cooperative for environmental education Repensar collected around a thousand batteries or battery components from three beaches in Maputo, some of which were in an advanced state of decomposition. In subsequent investigations, a connection was found between the quantities found and the proximity of two important water outlets, linking part of the neighbourhoods in the higher areas to the bay of Maputo. Several unofficial dumps were identified along the

Autódromo beach. Photo by Carlos Serra

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two ditches, as well as direct escape situations. It was found that, as with other heavier waste (glass and metals), the tendency is for the piles to be deposited, as sediment, on the beaches closest to the drains, while the various types of plastic and other light waste are carried by the tides.
In April 2020, following the decree of the state of emergency caused by the Covid-19 pandemic, the beaches were closed for leisure. This drastically reduced the waste produced locally. However, Repensar's monitoring teams continued to collect significant amounts of plastic waste brought in by the tides, mostly coming from water outlets in the metropolitan area of Maputo (Repensar 2021).
Pollution of the seas by plastic waste has received greater attention from society, thanks to coverage from the media, social networks and environmental protection organisations. However, no less important and worrisome, especially because of its potential impact on health, is air pollution caused by the burning of plastic waste or the degradation of plastic into micro plastic. Burning garbage is a standard practice in all urban centres in the country, whether in official or unofficial, municipal or district garbage dumps, or in public and community spaces, as well as in private backyards. Unfortunately, the lack of knowledge about the impact of burning waste (including plastics) on public health is widespread, even at the level of municipal executives and district governments. Burning has become a kind of effective and pragmatic solution given the difficulties in guaranteeing collection and transport to official dumps. Although at the international level there is a lot of documentation on the relationship between poor waste management, poor air quality in cities and the harmful impact on health, in Mozambique, so far, no study has yet been carried out on the subject. This fact may contribute, among other factors, to the delay in implementing more environmentally and health-friendly approaches.
The pollution of soils and inland waters deserves equal attention, whether it relates to underground aquifers contaminated by buried waste, or the direct discharge of waste into rivers, lakes, reservoirs and wetlands. As mentioned in relation to burning, burying waste (regardless of its categorisation and harmfulness) is a recurrent practice, heightened in urban areas or in places undergoing urbanisation and those which do not benefit from municipal or district waste collection services (Cardno 2021).

*

Pollution of the seas by plastic waste has received greater attention from society, thanks to coverage from the media, social networks and environmental protection organisations. However, no less important and worrisome, especially because of its potential impact on health, is air pollution caused by the burning of plastic waste or the degradation of plastic into micro plastic.

*

The delay in investment in the environmental education system

An important aspect to consider when it comes to the issue of waste management is the low level of knowledge about the rules and good practices, both across society as a whole and among local bodies that deal directly with the population.
In the context of the Rio Conference (1992), the Government approved, in 1995, the *National Environmental Policy*, which determined:

> Environmental education plays a fundamental role in creating and raising the sensitivity of citizens to their growing involvement in the search for solutions to environmental problems, which involves providing extensive environmental education at all levels of education, providing specific programs and funds for this purpose, and strengthening the teaching methods and practices used in public institutions responsible for initiatives of environmental education. (Council of Ministers 1995)

Two years later, the *Environmental Law* enshrined the right to environmental education (article 20). The 2004 Constitution provided for environmental education as one of the State's objectives in the area of environment and quality of life (article 117). These steps represent, in the formal field, a commitment to make the curricula currently in force more "green" and to develop new educational programs, both formal and informal, which are oriented towards the National Education System and society in general.
Nevertheless, few resources have been made available for environmental education and training of waste professionals and, in the field of waste management, there is a general deficit in terms of knowledge and implementation of basic rules. Behaviour analysis indicates a total ignorance of the impacts of waste on the environment and public health, as well as the concept of environmental citizenship, including rights and duties towards the environment, for example, the obligation to deposit waste in designated places.
For the implementation of waste management systems with regards to environmental and public health, including in the field of preventing, combating plastic pollution and overcoming the current paradigm of treating waste downstream, urgent investment needs to be made in environmental education, whether formal (through the National Education System) or non-formal (oriented to the whole society).

Circular Economy

According to Wautelet (2018: 1),

> over the last 150 years, our industrial economy has been dominated by a one-way model of production and consumption in which goods are manufactured from raw materials, sold, used, and then incinerated or discarded as waste. In the face of a rising global population and the associated growing resource consumption and negative environmental impacts, it becomes increasingly apparent that business as usual is not an option for a sustainable future.

Pearce & Turner (1990) worked on the bases of the concept of circular economy, as opposed to the classic linear economy, arguing that, considering the existing environmental problems and the scarcity of resources, the earth should be considered as a closed economic system, with attention given to the exhaustible character of natural resources and the production of waste.

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Ellen MacArthur Foundation (2017: 1) argues that the current system (the linear economy) is no longer working for businesses, people or the environment, because it implies taking resources from the ground to make products which we use, and then throw away when we no longer need (take-make-waste). For this reason, the linear economy has to change. "We must transform all the elements of the take-make-waste system: how we manage resources, how we make and use products, and what we do with the materials afterwards. Only then can we create a thriving economy that can benefit everyone within the limits of our planet". "It is a new way to design, make, and use things within planetary boundaries".
In terms of the notion of circular economy, it should be noted that, regardless of the existence of different schools and currents of thought, one idea is shared by all: "our ecosystem, including the economy and the society, should be considered as one among the other ecosystems and as part of the environment (i.e. biosphere)" (Wautelet 2018). In short, the circular economy is "an economic system that reuses raw materials and resources for the creation of a sustainable economy; free of waste and emissions" (Mohajan 2020: 2).
Kirchherr, Reike & Hekkert (2017: 229) defined circular economy as

> an economic system that replaces the "end-of-life" concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim of accomplishing sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations.

According to Andersen (2007: 1),

> In industrial ecology, it is implied that a circular economy will be beneficial to society and to the economy as a whole. Benefits will be obtained, not only by minimizing the use of the environment as a sink for residuals but – perhaps more importantly – by minimizing the use of virgin materials for economic activity. Intuitively, the potential benefits seem straightforward, but it is important to stress that the perspective prevailing within the circular economy approach is, in fact, based on physical rather than economic observations.

By promoting the adoption of closing-the-loop production patterns within an economic system, the circular economy aims to increase the efficiency of resource use, with a special focus on urban and industrial waste, in order to achieve a better balance and harmony between economy, environment and society. "The lesson learned from suc-

Katembe beach. Photo by Carlos Serra

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cessful experiences is that the transition towards circular economy comes from the involvement of all actors of the society and their capacity to link and create suitable collaboration and exchange patterns" (Ghisellini, Cialani & Ulgiati 2016: 27).

The starting question should not be: "where are we going to dispose of the waste?", but rather, "what can we do with each category or type of waste, in order to comply with the highest standards of health and environment?".

The circular economy has been receiving increasing attention in the country, especially in the context of efforts to curb plastic pollution. However, in order to speak effectively about the circular economy in Mozambique, it is necessary to identify and analyse the main obstacles to its full operationalisation and propose effective and sustainable solutions. In this sense, there is a structural weakness at the base level in the field of waste management, namely in the municipalities and districts. This includes the lack of appropriate legislation, trained personnel, focus on the prevention, reduction and recovery of waste, financial and logistical resources and above all, a permanent campaign to educate and sensitise citizens about the adoption of circular economy principles. Urgent work is needed to improve how local bodies (municipal and district) handle waste management in compliance with the highest environmental and public health standards and while focusing on reduction, reuse, recycling, composting and energy recovery, including the adoption of measures to prevent and combat plastic pollution and to replace the linear economy with the circular economy.

Conclusions

Waste management has been addressed in the world in general, and in Mozambique in particular, through a downstream approach, based on the components of non-selective collection, transport and deposit in landfills or open dumps, as well as the implementation of solutions that are highly harmful to health and to the environment such as burning, burial and dumping into sensitive ecosystems. None of the municipalities and districts in the country have selective collection systems, despite the provisions of legislation approved at the central level.

Among the most common wastes are plastics, in particular single-use items whose quantity in terms of production, consumption and disposal has been increasing significantly in line with economic and demographic growth trends. The impacts of plastic pollution have been growing in the world, and Mozambique is no exception. Not just in terms of the increase in pollution in the oceans as a result of water outlets (rivers, drainage ditches, underground collectors), but also in terms of the air quality as a result of burning plastic waste, as well as underground soils and aquifers, due to the habit of burying garbage in backyards. Damage to infrastructure is equally significant, given the relationship between plastic pollution and urban flooding.

There are waste management systems set up only for cities, towns and district headquarters. The vast majority do not meet the real needs of the areas and do not reach the entire neighbourhood and population. Moreover, if until a few years ago organic waste dominated, over time the dynamics of production, trade and consumption have revealed an exponential growth in packaging and, consequently, packaging waste (especially plastic).

For the circular economy to become a reality in Mozambique, there are structural aspects that should be noted, starting with addressing the paradigm that prioritises waste downstream over prevention, reduction and valorisation options. The starting question should not be: "where are we going to dispose of the waste?", but rather, "what can we do with each category or type of waste, in order to comply with the highest standards of health and environment?". It is also important to strengthen local governance (municipalities and districts), not only in terms of the implementation of existing legislation (including the *Regulation on Urban Solid Waste Management*) but mainly in creating a legislative framework that is adequate for the reality of each territorial district. In this sense, special attention must be given to the prevention and fight against plastic pollution, as well as to the assembly of simple, accessible and efficient selective collection systems.

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LEGISLATION

Constitution of the Republic of Mozambique, revised by Law no. 1/2018, of 12 June

Resolution No. 5/95, of 3 August (approves the National Environmental Policy)

Resolution No. 15/2020 of 14 April (approves the Government's Five-Year Program 2020-2024)

Law No. 20/97, of 1 October (Environment Law)

Decree No. 79/2017, of 28 December (approves the Regulation on the Extended Producer and Importer Responsibility)

Decree No. 16/2015, of 5 August (approves the Regulation on the Management and Control of Plastic Bags)

Decree No. 94/2014, of 31 December (approves the Regulation on Solid Urban Waste Management)

ABSTRACT ENG

As a result of population growth and the changes in consumption patterns, the poorest countries have been facing increasing and more complex difficulties in the field of waste management, in particular with regards to the impacts on health and the environment as a result of pollution in the air, water, soil and biodiversity. This article explores the case of Mozambique, where, despite the legislative improvements of the last decades, the situation is extremely challenging, especially in urban areas.

Carlos Manuel dos Santos Serra

is a Mozambican lawyer, scholar and environmental activist. He holds a PhD in Public Law, and is the coordinator of the Center for Environmental, Biodiversity and Quality of Life Law at the Faculty of Law of the University Eduardo Mondlane. He is also a founding member and General Director of the Cooperativa de Educação Ambiental Repensar, aimed at carrying out environmental education and awareness raising activities for children and young people.

Gestione dei rifiuti, inquinamento da plastica ed economia circolare. Vincoli e sfide nel caso del Mozambico

A seguito della crescita demografica e dei cambiamenti negli stili di vita, i paesi più poveri, come ad esempio il Mozambico, hanno dovuto affrontare difficoltà crescenti e sempre più complesse nell'ambito della gestione dei rifiuti, in particolare per quanto riguarda l'impatto sulla salute e sull'ambiente derivante dall'inquinamento dell'aria, dell'acqua, del suolo. La plastica, uno dei materiali più importanti e versatili mai inventati dall'umanità, costituisce ormai una parte significativa della totalità dei rifiuti prodotti dal paese, soprattutto a causa dei materiali monouso utilizzati nel packaging. La legislazione è stata aggiornata più volte: la Legge ambientale (1997) e le Norme sulla gestione dei rifiuti solidi urbani (2014), la Gestione e controllo dei sacchetti di plastica (2015) e la Responsabilità estesa per i produttori e gli importatori di imballaggi (2017) prestano un'attenzione particolare alla gestione sostenibile dei rifiuti e all'adozione di un approccio basato sull'economia circolare.

Nonostante questi sforzi, però, la situazione sul territorio evidenzia enormi difficoltà, specialmente nei centri urbani, dove la maggior parte dei rifiuti plastici viene abbandonata in discariche a cielo aperto, bruciata, seppellita o addirittura scaricata o persa in fiumi, fossi, fognature e bacini di raccolta.

L'educazione ambientale, nonostante costituisca un obiettivo governativo fin dal 1995, rimane scarsa o fondamentalmente inesistente, cosa che contribuisce all'assenza di approcci concreti nella ricerca di soluzioni per lo smaltimento dei rifiuti, con un'enfasi particolare sul riciclaggio e il recupero. Il Mozambico potrebbe essere spinto sul percorso dell'economia circolare attraverso un intervento integrato tra diversi elementi: l'educazione, la formazione e altre misure per migliorare la consapevolezza; la realizzazione di strumenti normativi adeguati per i comuni e i distretti; la preparazione di un pacchetto di incentivi per il recupero dei rifiuti; una spinta all'innovazione, soprattutto se focalizzata sulla ricerca di soluzioni per prevenire e combattere l'inquinamento da plastica e per promuovere al massimo il riutilizzo delle potenzialità dei rifiuti.

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