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The African Marine Waste Network and its aim to achieve 'Zero Plastics to the Seas of Africa'

In response to the global pollution crisis, the United Nations Environmental Assembly has called upon all people to commit to its initiative 'Towards a Pollution-Free Planet'.[1] In support, the African Marine Waste Network (AMWN) was launched in 2016 as the main programme of the Sustainable Seas Trust and has committed to work with all 54 African countries to assist them in improving waste management, thereby reducing the amount of plastic entering the sea. Africa faces many waste management challenges, which are compounded by high population growth rates; a rapid rate of urbanisation; a growing middle-class, which is increasing consumption rates[2]; and high levels of poverty. Collectively, these factors are said to account for Africa potentially becoming the most plastic-polluted continent within a few decades.[3]

The Inaugural International Conference of the AMWN was held in 2017, at which, through guidance from African and global experts, the 'Towards Zero Plastics to the Seas of Africa' objective was developed. The focus of the AMWN is to prevent marine pollution from both land- and marine-based sources by 2035. The conference revealed that Africa: is data poor and therefore has no measurable aspects upon which to build strategies and against which to monitor progress; does not have adequate education and capacity, including municipal capacity, to handle issues around pollution and waste management; has decision-makers and ordinary citizens who are not informed about plastic waste issues.

Purpose and aims of the African Marine Waste Network

The AMWN aims to be an active platform for collaboration and resource and knowledge sharing across Africa. This aim is to be achieved by building and strengthening networks among civil society, industry, NGOs and governments. The greatest challenge is to motivate people to care for the environment and convince them to reduce and to responsibly manage the plastics they use. Waste management facilities and services are poor in most of Africa, and it is therefore important to work with municipalities to appreciate the value of waste and thus encourage investment in the necessary infrastructure. The AMWN aims to support African governments to develop and implement appropriate waste management. Creative and novel methods to educate and communicate are needed to change public thinking and behaviour, and opportunities for local business development within communities need to be explored. The approach of the AMWN is to find solutions and to develop strategies based on solid evidence and that are measurable so that progress can be evaluated.

Monitoring programmes

A role of the AMWN is to test monitoring programmes that serve waste management objectives, and to roll out the successful methods to all African countries. In 2018, the AMWN began developing methods for measuring waste and for addressing issues such as waste education and economic incentives. Nelson Mandela Bay Municipality (NMBM), South Africa, was selected as the area in which to test proof of concept as it is large enough to be representative of a large African coastal city yet small enough to be manageable. Feasibility studies to test methods that quantify and monitor waste were conducted to provide baselines for the amounts of litter in South Africa. These are some of the first studies used to try to quantify mismanaged waste in Africa.

In 2019, the AMWN worked closely with the Western Indian Ocean Marine Science Association (WIOMSA) and rolled out the 'Zero Plastics to the Seas of Africa' project in Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania – the first multinational, regional litter monitoring project in Africa. These seven countries use the same techniques to sample macro- and mesolitter found on beaches, in rivers and mangroves. Preliminary results from an accumulation survey of one beach in NMBM during 2019 indicated that 65% of litter items are plastic, but that these accounted for only 12% of the items by weight (Sustainable Seas Trust, unpublished data). This project will continue until the end of 2021. The project aims to start monitoring street litter in 2020, and to roll out the methods in interested coastal and island countries in the east and west of Africa. Subsequently, the project hopes to reach those African countries with coastlines along the Red and Mediterranean Seas. In partnership with WIOMSA, AMWN is also compiling a Litter Monitoring Manual, to ensure that the methods described in the manual account for the variable human and funding resources, as well as the highly variable amounts of litter found in Africa. The Manual will be translated into three languages (Portuguese, Swahili and French) in 2020, and into other languages spoken in Africa in following years.

Research

Another research project of the AMWN investigates microplastic-related pollutants (MRPs) in organisms at different levels of the food web in Algoa Bay, South Africa. Data from this project will be used to create awareness of the health consequences of plastic waste entering the seas. During 2018, methods were tested to determine whether MRPs could be detected in selected organisms in Algoa Bay. The following year it was confirmed that the methods positively detected MRPs in the organisms and therefore other organisms will be tested in 2020 and 2021 to give a holistic picture of MRPs in the food web.

Owing to Africa's vast size and the challenge of accessibility in many areas, the use of remote-sensing techniques to measure litter has been tested. At the beginning of 2019, unmanned aerial vehicles were used to survey a selected area of NMBM for litter. Tested methods and resolutions were used to determine whether litter loads could be quantified from the imagery obtained from these vehicles. Based on the findings from this initial survey, five

sites were selected and surveyed early in 2020. These sites and more will continue to be surveyed at least twice a year to monitor whether litter loads in NMBM are decreasing.

At the end of 2019, the AMWN started developing a mobile application designed for citizens and scientists that will teach users about plastic waste. Whilst there are already many litter monitoring mobile apps, there is a need for an app that is specific to African conditions. This app must cater to citizens who have a low level of education, and the data obtained must be stored with an African data server to ensure that it is readily available at costs lower than those for data from servers outside Africa. Additionally, the litter monitoring mobile app is being designed to complement the above-mentioned Litter Monitoring Manual (i.e. litter items to be monitored via the app are based on the datasheets of the Manual), ensuring that litter data will be collected in a comparable manner.

To increase the network's reach and connect stakeholders, the AMWN is developing the 'Are you on the map?' project. Three online interactive maps fall under this project: (1) a Waste and Recycle map showing all recycling drop-off points, recycling companies and municipal waste facilities throughout South Africa, (2) a map depicting all industries that relate to the AMWN in some way, and (3) a 'Clean up PE' map that aims to show areas of NMBM that are consistently cleaned by members of the public. As the project grows, the maps will include other African countries. The aim of this research-communication project is to connect stakeholders of the AMWN and allow them to distribute waste-related information.

Education

If Africa is successfully to overcome waste management challenges, it is vital that each country grows its capacity in tertiary and secondary education, research organisations, industry, governments and municipalities. Currently, very few schools include marine waste and plastics issues in their curricula, if at all.[4] At present, the Education Department of the AMWN is in discussion with South African national education authorities about introducing plastic pollution and other waste issues into schools. To ensure that educators are well informed, and do not spread misconceptions regarding waste, the AMWN is developing a comprehensive and accurate Education Resource Book for Africa from which teaching modules may be extracted. The book is a collaboration between global and African specialists and will be available online at the end of 2020.

In the last quarter of 2019, a total of 4000 learners in the Eastern Cape were educated about marine waste, and 40 teachers were given educational resources to begin structuring their curricula on marine waste. Moreover, throughout 2019 the AMWN invited experts in marine waste and recycling to give 14 webinars that were streamed across Africa, which will continue in the future. An e-learning facility is being developed so that education courses can be shared across all 54 African states.

Two years ago, the African Youth Waste Network was launched by the South African Minister of Environmental Affairs and the Norwegian Minister of Education, to harness the enthusiasm of Africa's youth, as this cohort is predicted to exceed 60% of sub-Saharan Africa's population.[5] The youth can influence their parents and communities in changing perceptions on waste-related issues and can contribute to the 'Zero Plastics to the Seas of Africa' campaign. The Youth Network educates through fun activities such as clean-ups, rocky shore exploration and outings to recycling plants, and thus complements formal education modules. In October 2019, the first annual youth march took place and was attended by about 500 school learners from 13 schools in the NMBM.

Economic enterprise development

Poor communities often do not have municipal waste removal services, resulting in huge accumulations of litter close to where people live. To help alleviate poverty in Africa, the value of waste needs to be communicated. Providing people with incentives – such as money or food – for collecting waste, can provide jobs in low-income communities whilst simultaneously alleviating litter in a small but tangible way. The AMWN is investigating possible solutions to alleviate poverty and litter loads through enterprise development, and thus integrate the circular economy into Africa.

Currently, the AMWN is working with the Polyolefin Responsibility Organization (Polyco) to roll out mobile buy-back facilities, through their Packa-Ching programme. In South Africa, Packa-Ching works on a 'cash for trash' system in which individuals can exchange their recyclable waste (tins, plastic, glass and paper) for 'cash'. Funds are loaded onto the individual's mobile phone which, through banking apps, can be used in the same manner as bank cards. A project that the AMWN will begin in April 2020 aims to link producers of plastic pellets made from recycled plastic with stakeholders in the fishing industry, with the idea of using discarded fishing gear to make plastic pellets.

Communication

To effect change in stakeholder behaviour around waste and its management, it is essential not only to communicate correct information, but to communicate it in such a way that it will be remembered and acted upon. The goal of communication in combatting marine waste is to reach and influence masses of people so as to inspire behavioural change and the adoption of positive habits in responsible waste management. The Communication Department of the AMWN uses print, social and visual media to appropriately communicate with various stakeholders, with the aim of becoming the central source of reliable information. An additional aim is to create communication hubs across Africa to allow further connection, collaboration and knowledge sharing.

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