

2. CAMBODIA

Summary of research topics: *The few studies published in Cambodia relate results from surveying and monitoring of pollution from macroplastics in unspecified coastal ecosystem areas.*

Summary of understanding at national level: *The few studies and news reports have revealed plastic pollution as an emerging issue in the country. However, the level of understanding is limited to some macroplastic abundance in a few areas.*

Keywords/research fields: *National approach; solid waste; trade of plastic waste; research foci; marine environs; surveys and monitoring; main players*

2.1 Context

2.1.1 National approach to plastic waste and its management

Whilst the definition of municipal solid waste (MSW) in Cambodia is not clearly defined, the management of MSW in Cambodia is often provided by the commune authority, or by private companies under the supervision of local authorities, using a collect-transport-dispose system (Sethy et al., 2013). There are several laws, sub-decrees, declarations and guidelines on waste management put in place (Figure 1.2.2.1), but waste management still varies across different provincial towns. Where there is no management system, the responsibility falls on the household and often results in burning or illegal disposal on vacant land or into river bodies. On the whole, the existing waste management system of Cambodia may not be sufficient to cope with the volume of waste produced.

Several challenges to waste management have been highlighted by the Cambodian government (pers. comms., N. Kim, Deputy Director General, Ministry of Environment Cambodia, 11 November 2019). Apart from dealing with increasing volumes of waste from different sectors, there are also challenges with respect to waste management standards, guidelines, compliance, enforcement and coordination between relevant waste management sectors at local levels. The low level of awareness on solid waste management is another challenge faced by Cambodia.

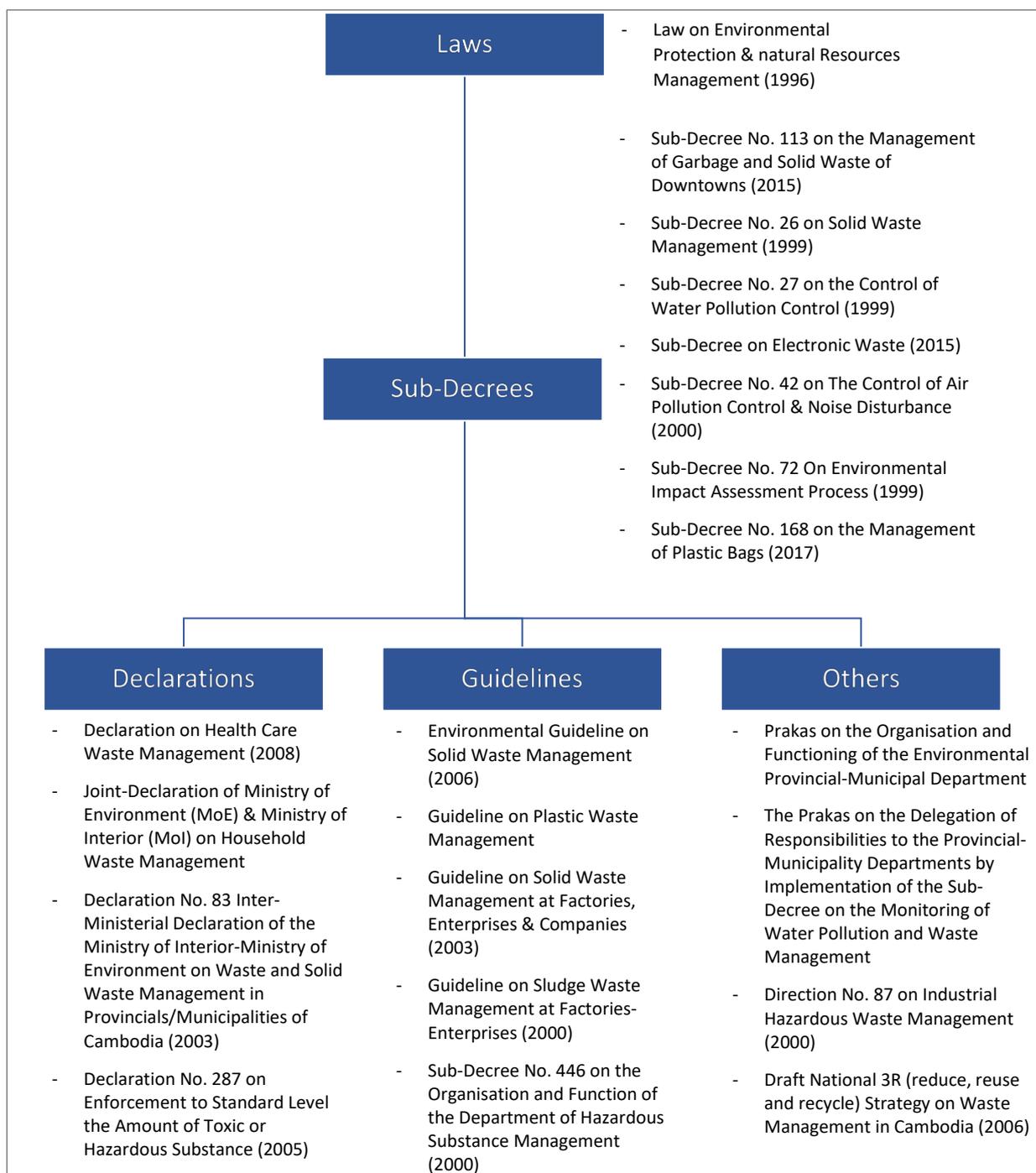


Figure 1.2.2.1. Mechanism of plastic waste management in Cambodia.

Less than 10% of the plastic waste generated are recycled in local recycling industries, where most recyclers appear to be cautious with plastic recycling due to the level of effort involved in collection and its relatively low pay-offs (World Resources Forum, 2019: available <https://www.wrf-antwerp2019.be/sites/default/files/atoms/files/The%20effects%20of%20the%20Chinese.pdf>). As a result, piles of plastic waste on the coast of Cambodia are a common sight (The Guardian, 2018: available <https://www.theguardian.com/world/2018/apr/25/mountains-and-mountains-of-plastic-life-on-cambodias-polluted-coast>).

Cambodia's Ministry of Environment launched its first plastic reduction campaign in May 2019 in Battambang Province, and later in Siem Reap and Preah Sihanouk (Phnom Penh Post, 2019: available

<https://www.phnompenhpost.com/national/ministry-campaign-tackles-plastic>). The campaign aims to promote awareness of plastic waste and its impacts on the local population, and to encourage the reduction of plastic waste through the adoption of the 3R (reduce, reuse, recycle) framework. One reduction approach is to place regulatory charges on plastic bags, which has been implemented in major supermarkets of Cambodia. The Ministries of Environment, Interior, Economy and Finance, and Tourism pushed this bill through with support by the Fondazione ACRA, an NGO based in Italy (Greenpeace, 2019). Fondazione ACRA also launched a campaign to raise awareness on plastic alternatives (from 2014-2017, valued at €1,341,033, funded by the European Union).

2.1.2 Plastics as a proportion of solid waste

In 2016, the MSW for Cambodia was estimated at 1.2 million tonnes, and with a projection of reaching 1.7 million tonnes in 2030 and 2.6 million tonnes in 2050 (Kaza et al., 2018). The amount of MSW generated in Cambodia is approximately 6.8 million tonnes per year, based on a figure of 0.487 kg per capita daily (Sethy et al., 2013). This value has since increased, for example, the MSW of Phnom Penh, the capital city of Cambodia is estimated at 0.73 kg per capita per day across a population of 15.39 million people (Provincial Department of Planning, 2015). Waste collected and transported to dump sites in urban areas was approximately 317,550 tonnes in 2004, increasing to 518,053 tonnes in 2008 and 630,679 tonnes in 2011 (Sethy et al., 2013).

In Phnom Penh, plastics account for the second largest proportion of the waste generated at 20.9% (Singh et al., 2018). The consumption rate of single-use plastic bags in Phnom Penh measures at 10 million pieces daily, where individuals in urban areas use more than 2,000 plastic bags annually (Fondazione ACRA, 2016).

2.1.3 Illegal trade of plastic waste

Illegal imports of plastic waste appear to have made their way into Cambodia (mostly from the United States of America and Japan according to a Greenpeace report). Following China's ban on plastic waste imports in 2018, the plastic waste imports into Cambodia would have approximately doubled, from 650 tonnes in early 2016 to 1,700 tonnes in end-2018 (Greenpeace, 2019). However, recent coverage from the Phnom Penh Post reports that Cambodia is now implementing its regulation more stringently to curb these illegal imports, through a collaboration between the Ministry of Environment and relevant institutions, including the General Department of Customs and Excise (Phnom Penh Post, 2019: available <https://www.phnompenhpost.com/national/illegally-imported-plastic-waste-returned-back-us-canada>).

In July 2019, Cambodia has announced plans to repatriate 1,600 tonnes of illegal plastic waste back to the exporters of United States of America and Canada. The legal grounds of this decision is presumably based on more stringent application of the Basel Convention and local regulation (The Guardian, 2019: available <https://www.theguardian.com/world/2019/jul/17/cambodia-plastic-waste-us-canada-send-back>).

2.2 Research review of pollution from marine plastic

2.2.1 Research overview

Research on marine plastics in Cambodia remains limited with some preliminary works on the surveying and monitoring of macroplastics.

One peer-reviewed report has been found for this study (Table 1.2.2.2), which looked at surveying and monitoring the environmental status specifically in the Kep Archipelago.

Table 1.2.2.2. List of published work identified and examined in this study for Cambodia.

Published Peer-Reviewed Work/Research Team	Aim of Research	Period of Study
Reed et al. (2015) Marine Conservation Cambodia (MCC)	Examining the marine environmental status of the Kep Archipelago (Koh Seh, Koh Mak Prang, Koh Angkrong), in relation to reef ecosystems health	March 2014

In addition, two ongoing research projects related to marine plastics were also found, albeit with no published reports available at the time of this study. These two projects are conducted by the international NGO Fauna & Floral Institute (FFI) and the United Nations Development Programme (UNDP). The FFI project, 'Tackling plastic pollution for communities and coral reefs in coastal Cambodia' surveys and monitors for macroplastic debris on coastal Cambodia (Koh Rong, Koh Sdach, Sihanoukville). See FFI: available <https://www.fauna-flora.org/news/tackling-plastic-pollution-communities-coral-reefs-coastal-cambodia>.

The UNDP project, 'Combating Plastic Pollution in Cambodia' is a policy review report which examines the local regulation laws involving macroplastic products (bags, foams and straws) as well as their challenges, and provides recommendations. See UNDP: available <https://www.kh.undp.org/content/cambodia/en/home/projects/our-action-for-plastic-pollution-in-cambodia.html>.

2.2.2 Types of research conducted

Types of plastics research foci

The three research projects focused entirely on macroplastics with no polymer identification. No published peer-reviewed study on plastic-associated (organic or inorganic) contaminants.

Coverage of marine environs

Information on marine environs that have been studied is only available in the research project of FFI, which focuses on macroplastics found on the shoreline. Unfortunately, this publication does not specify surveying locations and other specific findings.

2.2.3 Survey and monitoring

The research conducted by MCC examined the coral reef ecosystems of selected islands in the Kep Archipelago in 2014 and found macroplastics, mostly in the form of fishing gear, line, and other plastic waste. The main objective of these annual reports however, lies in assessing the status of marine biota (e.g. vertebrate, invertebrate, environment), and they have since 2015 made no further mention of marine plastic pollution in the Kep archipelago, perhaps due to the fact that marine plastic was simply not an objective of these reports.

The FFI has teamed up with local researchers and communities in initiating marine plastic research in Cambodia through surveys of coastline debris (including macroplastic), waste sorting and household interviews. Preliminary results of the coastline surveys have found that plastics account for approximately 80% of debris, and that single-use plastic bags and bottles are major components of plastics entering Cambodian waters, alongside food packaging, disposable cutlery, straws and fishing gear.

These research projects on macroplastics do not identify polymer types.

2.2.4 Source differentiation and pathways

There is no published peer-reviewed study that seeks to differentiate different sources of plastic debris and their leakage into the ocean and pathways, nor the extent to which marine plastic debris are a pathway for associated contaminants or invasive species.

2.2.5 Movement of plastics, accumulation and hotspots

There is no published peer-reviewed study on the movement, accumulation and hotspots of marine plastics.

However, news records suggest that abundant plastic trash in Cambodia, without the right management, often ends up in piles on public streets, beaches and in waterways (The Guardian, 2018: available <https://www.theguardian.com/world/2018/apr/25/mountains-and-mountains-of-plastic-life-on-cambodias-polluted-coast>).

2.2.6 Ecological and environmental impacts

There is no published peer-reviewed study on the ecological and environmental impacts of marine plastics.

There have been several informal reporting of marine biota death possibly as a result of plastics, as seen in the dead Irrawaddy dolphin found on Koh Rong Samloem beach with visible plastic mass in its mouth and intestines (Khmer Times, 2018: available <https://www.khmertimeskh.com/523122/dead-irrawaddy-dolphin-found-on-beach/>).

2.2.7 ALDFG

There is no study focusing on ALDFG, although fishing gear are mentioned in Reed et al. (2015).

2.2.8 Social perceptions and socio-economic impacts

There is no peer-reviewed study on the social perceptions and socio-economic impacts of marine plastics.

However, plastic waste accumulation and degradation at dumping sites appears to have social impacts on local populations living or working near such sites, especially with regards to their quality of life and on their health (Channel News Asia, 2018: available <https://www.channelnewsasia.com/news/asia/with-cambodia-drowning-in-a-wave-of-waste-plastic-could-be-10388780>).

2.3 Main players in marine plastic research

The marine plastic research, though limited, is driven by several researchers from academic institutions (i.e. the Royal University of Phnom Penh), local SCUBA divers (i.e. Kuda Divers), local NGOs (i.e. Marine Conservation Cambodia) and international NGOs (i.e. FFI and UNDP).

FFI appears to have stepped in to lead preliminary research on marine plastics. The FFI has a Marine and Coastal Conservation Programme which identifies strategies for minimising marine plastic waste, conducts plastic waste research, and consultations in Phnom Penh and coastal areas.

The two other organisations identified appear to have limited emphasis on marine plastic research. The UNDP produced policy report reviews on plastics that would leak into the natural environment eventually as marine plastics, but focuses more on upstream management on the 4Rs (refuse, reduce, recycle, reuse). Reports from the MCC, which undertakes the annual marine assessments in the Kep archipelago, do not emphasise marine plastic research except for a brief monitoring in the 2015 report.

2.4 Summary of understanding

The few marine plastic assessment studies and news reports have revealed that plastic pollution is an emerging issue in Cambodia, despite its relatively smaller coastline compared with other ASEAN+3 member states. However, the limited studies found on marine plastics research do not provide the understanding of pollution from marine plastic that Cambodia would need to plan a response. It will be useful for Cambodia to improve its understanding of this issue through consistent and more holistic surveying and monitoring efforts of marine plastics that are existing across different aquatic environments, sources, leakages and pathways, as well as the extent of impact on its people and the environment that they are living in.