



## CASE STUDY

# Systems thinking approach towards emerging, persistent and systemic issues in Asia and the Pacific

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### A. The emerging problem with microplastics in Japan

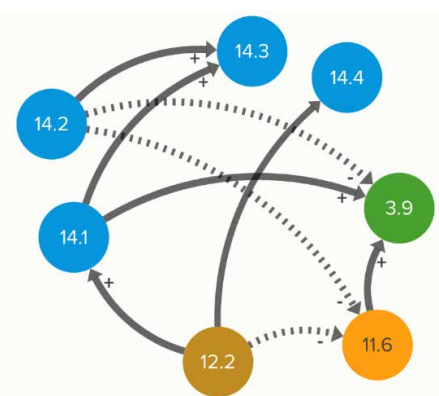
A five-year study (2009–2014) conducted by the Japan Environment Ministry<sup>1</sup> found 48.1 tonnes of microplastic (polyethylene terephthalate bottles) from China and the Republic of South Korea drifting along the Japanese shores facing the Sea of Japan and the East China Sea. On the coastlines facing the Pacific Ocean, they found plastic derived from Japan.

In a separate study, Tokyo University of Marine Science and Technology and Kyushu University found that each tonne of seawater contains an average of 2.4 pieces of microplastic,<sup>2</sup> which harbour high concentrations of polychlorinated biphenyl—also found in the fat of seabirds who ingested contaminated seawater and fish stock. The findings raised health concerns in Japan, especially because the country consumes one of the largest volumes of fish (one fifth of the global tuna catch). Climate change research has shown how increased concentrations of carbon dioxide in the atmosphere accelerate ocean acidification and contribute to temperature rise, thereby damaging the various ocean ecosystems that rely on maritime health.

As the diagram illustrates, the study on microplastics in Japan reflects the direct connections between SDG 14 (on life below water) with other targets and the indirect connections, such as to SDG 3 (on good health and well-being), SDG 11 (on sustainable cities and communities) and SDG 12 (on responsible consumption and production).

Sustainably managing and protecting marine ecosystems (target 14.2) and reducing marine pollution (target 14.1) are keys to solving the trash problem that Japan is facing. If these two issues are addressed, they will help reduce ocean acidification (target 14.3), environmental impacts to the country (target 11.6) and reduce the number of deaths due to water pollution (target 3.9).

At the same time, Japan, as a large consumer of marine products, faces a serious problem of illegal, unreported and unregulated fishing (target 14.4), reflecting a need to also change production and consumption patterns (target 12.2).



1 See <http://asia.nikkei.com/Tech-Science/Science/Trash-clogged-oceans-have-alarm-bells-ringing?page=1>

2 See [www.japantimes.co.jp/opinion/2016/07/30/editorials/plastic-waste-turning-seas-toxic/](http://www.japantimes.co.jp/opinion/2016/07/30/editorials/plastic-waste-turning-seas-toxic/)



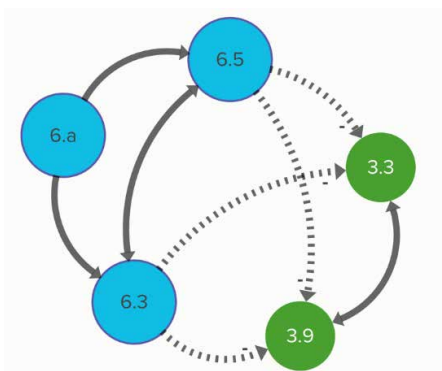
## B. The persistent problem with wastewater management in Singapore

A city-state with a landmass of 700 square metres and a daily consumption of 1.36 billion litres of water, Singapore is considered water-scarce and imports its supply from neighbouring Johor State in Malaysia. In 2001, the Singapore Ministry of the Environment transferred responsibilities of sewerage and drainage to the Public Utilities Board. The move included the management of potable water.

The transfer allowed the Public Utilities Board to develop and implement a legal and regulatory framework involving a holistic policy that included the renewability of water, protection and expansion of water sources, storm water management, desalination, demand management, catchment programmes, and consumer education and awareness on conscientious water use. Singapore still imports water from Johor, but it is working towards replacing foreign water imports with local sources and achieving quality management with technological developments.

In Singapore, protected water catchment areas (less than 5 per cent of landmass) are demarcated and gazetted, and no pollution-causing activities are allowed therein. Half of the land area is partly protected catchment, with the allotment expected to increase to two-thirds. Partially protected catchment requires environment-friendly effluent treatment for wastewater and the rearing of animals (cattle and pigs) to be restricted to outside the zones.<sup>3</sup>

As the diagram illustrates, wastewater management in Singapore directly connects to SDG 6 and indirectly connects to SDG 3 (on good health and well-being). Singapore, perhaps more than any other country, has limited natural resources and a particularly critical situation with water resources. Water- and sanitation-related programmes (target 6.a) are extremely important to sustainably manage water in the country. The Government is thus implementing and integrating these programmes at all management levels through transboundary cooperation (target 6.5) that will improve the quality of water and increase the treatment of wastewater (target 6.3). The overall result will reduce the contamination of waterborne diseases (target 3.3) and will substantially reduce the number of deaths from water pollution (target 3.9).



## C. The systemic problem with gender and sanitation facilities in Nepal

Primary and secondary school teachers in Nepal are the core source of girls' information regarding menstruation. Yet, most teachers generally avoid teaching reproductive health. A study published in 2010<sup>4</sup> found that girls receive information from their mothers regarding reusable cloth to absorb blood and the practice of cleansing rituals along with opinions on cultural pollution and the cautioning of behaviour towards men and boys. But little information is given regarding physiology—most likely because the mothers are uninformed.

Menstruation, along with the lack of appropriate facilities (including safe water and clean and private toilets), means that girls are unable to keep a standard of hygiene conducive to school attendance and participation. In that 2010 study, menstruation was found to affect the attendance of more than half of the girls surveyed, with lack of privacy for cleaning and washing cited as the main reason (at 41 per cent), followed by the lack of a disposal system.

<sup>3</sup> See [http://siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/WRM\\_Singapore\\_experience\\_EN.pdf](http://siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/WRM_Singapore_experience_EN.pdf)

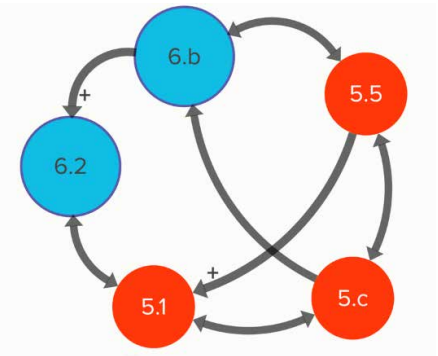
<sup>4</sup> See [www.wateraid.org/~media/Publications/menstrual-hygiene-south-asia.pdf](http://www.wateraid.org/~media/Publications/menstrual-hygiene-south-asia.pdf)



Although some girls did not withdraw from school, their school performance suffered due to the psychological worry that boys would realize their condition and ridicule them for it. There is a real fear of staining on their clothes, which provokes undue stress and depression. Girls reported the need to find secretive and dark places to hide their menstrual cloths, and fear being unaccepted and ridiculed in their school.

As the diagram illustrates, school sanitation facilities in Nepal reflect a direct and indirect connections between SDG 5 (on gender equality) and SDG 6.

Nepal faces a serious problem of inadequate sanitation and hygiene (target 6.2), especially for girls. Several surveys from the same WaterAid research publication have shown that girls perform poorly at school when they menstruate because they fear it will trigger ridicule or discrimination (target 5.1) by boys. The greater the participation of women in decision-making processes (target 5.5), the more likely there will be sound policies and enforcement of legislation for the empowerment of girls (target 5.c).



Edited by Ms. Karen Emmons.

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