

LCQ18: Impacts of microplastics on the ecosystem and human health

Following is a question by the Hon Kenneth Lau and a written reply by the Secretary for the Environment, Mr Wong Kam-sing, in the Legislative Council today (November 21):

Question:

It has been reported that the findings of a number of overseas studies have revealed that microplastics (i.e. plastic pellets or flakes of less than 5mm in diameter or length, including plastic fibres as minute as having a diameter or length of only 1µm) are widely found in bottled water, tap water, seawater, edible salt, marine life and human waste. Some researchers have pointed out that microplastics, given their very tiny size, may enter human vascular and lymphatic systems, thereby jeopardising human health. In this connection, will the Government inform this Council:

(1) whether it has monitored on a regular basis the concentration of microplastics in the water bodies of the reservoirs and rivers of Hong Kong; if so, of the outcome; if not, the reasons for that;

(2) as the Government said in November last year that the Water Supplies Department had engaged consultants to conduct a review on the risks of plastic fibre materials on drinking water safety, of the progress of that review; whether it has evaluated the impacts of drinking water containing microplastics on human health; if so, of the details;

(3) whether it compiled statistics and conducted researches in the past three years on the concentration of microplastics in Hong Kong waters and marine life; if so, of the details; if not, the reasons for that;

(4) of the microplastics removal capability of the sewage treatment processes in various sewage treatment works, as well as the relevant performance indicators; and

(5) as the authorities said in April this year that they had commissioned consultants to conduct a one-year study to examine the impacts of microplastics on Hong Kong's environment, and to gain an understanding of the bans imposed by places outside Hong Kong on personal care and beauty products containing microplastics, so as to formulate regulatory proposals applicable to Hong Kong, whether the authorities will, before the study is completed, introduce measures to reduce microplastic materials entering the natural environment; if so, of the details; if not, the reasons for that?

Reply:

President,

Microplastic pollution and the associated potential environmental impacts are a new global issue in recent years. Microplastics found in the aquatic environment have different identities and origins. They include microbeads arising from industrial production (e.g. as additives in personal care and cosmetic products (PCCPs)) and fragments from degradation of plastic products and waste. The common concern about microplastics is that it may be mistakenly consumed by aquatic organisms as food and toxic substances may also be adhered to or accumulated on its surface, thereby causing potential impacts on the ecosystem and human health through food chain transfer. There are opinions that preventive measures should be taken as soon as possible to reduce the release of plastic materials to the marine environment. We have been keeping a close watch on the latest development on the subject and, apart from conducting a 1-year consultancy study for developing appropriate control strategies targeting microbead-containing PCCPs, have also been collecting and studying relevant scientific research findings and data from various sources.

Our reply to the question raised by the Hon Kenneth Lau is as follows:

(1) At present, there has not yet been a unified standard or protocol in the scientific community for environmental monitoring of microplastics. Sampling and analytical methods as well as the types of plastic polymers being studied vary among individual research projects. Authorities in the international arena, such as the United Nations Environment Programme, Codex Alimentarius Commission (under Food and Agriculture Organization of the United Nations and the World Health Organization (WHO)) and European Food Safety Authority, etc, have not yet promulgated any relevant guideline or standard on microplastics. Under these circumstances, the Environmental Protection Department (EPD) has not conducted any routine monitoring of microplastics in Hong Kong's rivers and streams. To our knowledge, there has not been any government organisation announcing the routine monitoring of microplastics or releasing such data.

At present, the EPD is keeping abreast of the international and local development in environmental monitoring methods for microplastics. We are also actively participating in discussions on the standardisation of microplastic monitoring methodologies at symposiums organised by international and regional organisations (e.g. the Asia-Pacific Economic Cooperation) with a view to taking follow-up actions on the environmental monitoring of microplastics at a suitable juncture.

On the issue of microplastics in drinking water, the Water Supplies Department (WSD) has engaged consultants to collect information and carry out a study. It similarly shows that there is currently no internationally standardised method for testing microplastics in water samples, and no drinking water standard on microplastics has been adopted by any overseas jurisdiction. Furthermore, the WHO has not yet included microplastics in its Guidelines for Drinking-water Quality as health-related parameters that need to be monitored. In these circumstances, the WSD has not conducted any routine monitoring of microplastics at local reservoirs or water gathering

grounds. Nevertheless, the WSD will keep in view related international development. If researches do show that microplastics will pose a risk in drinking water safety, the WSD will work with experts in the field and consult relevant government departments on the inclusion of microplastics as one of the monitoring parameters and formulation of corresponding measures.

(2) According to the risk assessment conducted by the WSD's consultants, although international studies on microplastics in drinking water are still at an early stage, the current outcome reveals that microplastics (including microplastic fibres) are ubiquitous in the environment, and drinking water as a medium only accounts for a very small part of the total human intake, as compared to other exposure routes including food and consumable products (e.g. clothing, cosmetics and skin care products, toothpaste, shower gel, etc). Therefore, the consultants consider that even if microplastics are present in drinking water, it will not constitute a major health risk.

(3) In the absence of a standardised monitoring method and protocol as mentioned in (1), the Government has not conducted any statistical analysis or research study on the concentrations of microplastics in Hong Kong waters and marine organisms in the past three years. Nonetheless, we are aware of local academic research studies in recent years reporting that microplastics do exist in various locations in Hong Kong waters, in concentrations not higher than others places and presenting relatively low levels of potential environmental impact. Through various channels including the Environment and Conservation Fund, the EPD will subsidise and encourage local academic institutions to conduct relevant research projects with the aim of gradually building up the local scientific database on microplastics.

(4) The Drainage Services Department operates sewage treatment works to remove pollutants for meeting effluent quality standards as stipulated in Discharge Licences issued under the Water Pollution Control Ordinance. The current effluent quality standards do not cover microplastics. However, as over 90 per cent of sewage in Hong Kong is receiving chemically enhanced primary treatment (CEPT) or secondary treatment before being discharged, it is envisaged that a significant portion of the microplastics in raw sewage should have been removed along with other pollutants during the treatment process. Overseas open literature has demonstrated that microplastics removal rate in CEPT plants is about 70-80 per cent, and is even higher for secondary treatment works.

(5) Apart from the one-year consultancy study, the EPD has been implementing multi-pronged measures to reduce plastic waste generation at source and curb their release to the sea with a view to alleviating its impacts on the marine ecosystems. For example, we held a "Plastic Free Beach, Tableware First" campaign at all public beaches this summer to encourage members of the public and eateries in the vicinity of the beaches to avoid the use and distribution of disposable plastic utensils. In the coming year, the Government will take the lead to implement green procurement policies including avoiding disposable plastic tableware of single use. Specific measures will include: prohibiting the provision of plastic straws and polystyrene food containers in premises serving government staff; requiring the restaurant operators at

certain government premises to avoid the use of disposable tableware as far as practicable in new or renewed contracts; working together with the catering trade to encourage less use of disposable tableware for promoting waste reduction at source.

Furthermore, since the set-up of an inter-departmental working group for cleaning shorelines in 2012, additional resources amounting up to HK\$100 million per year have been allocated for strengthening the cleanup of marine refuse, patrol and enforcement against littering at sea, and also providing supportive facilities for preventing refuse from entering the sea. For examples, more waste recycling bins are provided at various coastal locations including piers, landing points, waterfront areas, etc; more than 190 water dispensers are set up at coastal areas including beaches, water sports centres, promenades and waterfront parks to encourage citizens to bring their own water bottles and avoid buying drinks in single-use plastic bottles. The Government has also been promoting clean shorelines and waste reduction at source through publicity and education activities, the Clean Shoreline Engagement Platform as well as the Environment and Conservation Fund.