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GEC's Survey and Review on Water Footprint from Japanese Perspective

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Background

- In Japan, a lot of water from overseas is used through imported products, therefore, various life activities are closely related to the world water issues.
- The water footprint concept has the potential to advance water efficiency and water quality with considerations on global supply chains and life cycle.
- Water footprint has already been raised in ISO, and the water footprint standard is under the scope of ISO Technical Committee (ISO/TC 207).

Background

- Responding to the international movement on water footprint, a working group has been formed under the Japanese national committee for ISO/TC207/SC5 to consider Japan's responses.
- In Japan, there are concerns on the current proposed water footprint, for example;
 - Various types/patterns of water consumption in production processes/stages are assessed with only a single indicator.
 - Not only water consumption but all water pollution is counted as water footprint, etc.
 - Awareness of water footprint among Japanese public is still low for practical application.

Awareness of WF among Japanese public

- ❑ An example of Web survey on water footprint
 - Potora Ranking Website operated by NTT Navispace Corporation (http://rn.potora.jp/ac/description/view/_/iri/3019532) (16-23 December 2009, N=182)
 - “Never heard of it.” = 171 (94%)
 - “Heard of it somewhere.” = 9 (5%)
 - “Know it.” = 2 (1%)
- ❑ Wikipedia: Japanese language version
 - “No search result” on “water footprint” (The article on “virtual water” exists.)

GEC's survey on water footprint

- In these circumstances, the Japanese Ministry of Environment called for bids for a survey to conduct a survey on the state of water footprinting in Japan and at the global level, and GEC undertook the survey. (Jan.-Mar. 2010)

Survey Methods

- Literature survey through the Internet
- Consultation with experts in Japan
 - Prof. Oki, Tokyo University
 - Dr. Aoki, UNEP/IETC

Current Definition of Water Footprint

The WFN defines the water footprint in its manual as follows;

- The total water footprint is the sum of the green, blue and grey water footprint.
- ‘Water consumption’ means loss of water from a surface/ground water catchment area, by incorporation into a product, evaporation, or discharging to another catchment area or the sea.
- The water footprint includes not only direct water use but also indirect water use.

1. Proposed Requirements for Water Footprint as Environmental Indicator

- ◆ When the water footprint is standardized, it is required that the water footprint must possess explicit characteristics as environmental indicator to consumers, as follows:
 - The components of water footprint must have additivity. The values of calculated water footprint can be compared in terms of quantity, and the results of comparison fit with consumers sense. (e.g., “larger values represent more negative environmental impact.”)
 - Water footprint should provide incentives for efficient use of water resources and water saving efforts, and the water saving efforts can be reflected in the calculation of water footprint.

2. Question about the Additivity of Green, Blue and Grey Water Footprints

- Blue and Green water footprint present the volume of water consumption during production processes.
- On the other hand, grey water footprint presents the volume of freshwater required to assimilate pollutant loads based on existing ambient water quality standards, therefore, its characteristic is totally different from the one of blue and green water footprint.
- It would be reasonable to indicate three water footprints individually. But if they were simply added to a single value, it would be meaningless.
- Indication of the sum of values essentially without additivity leads to confusion among consumers, etc.

3. Question about the Grey Water Footprint

- In the WF Manual, grey water footprint calculations are carried out using ambient water quality standards for receiving freshwater body.
- Ambient water quality standards are often set for multiple pollutants (SS, BOD, nutrients, heavy metals, pesticides, etc.). Depending which standard is used, the calculated grey water footprint varies widely.
- In some developing countries, ambient water quality standards are not always properly established and water quality data is not always collected sufficiently. In such cases, the reliability of calculated grey water footprints is not always ensured.

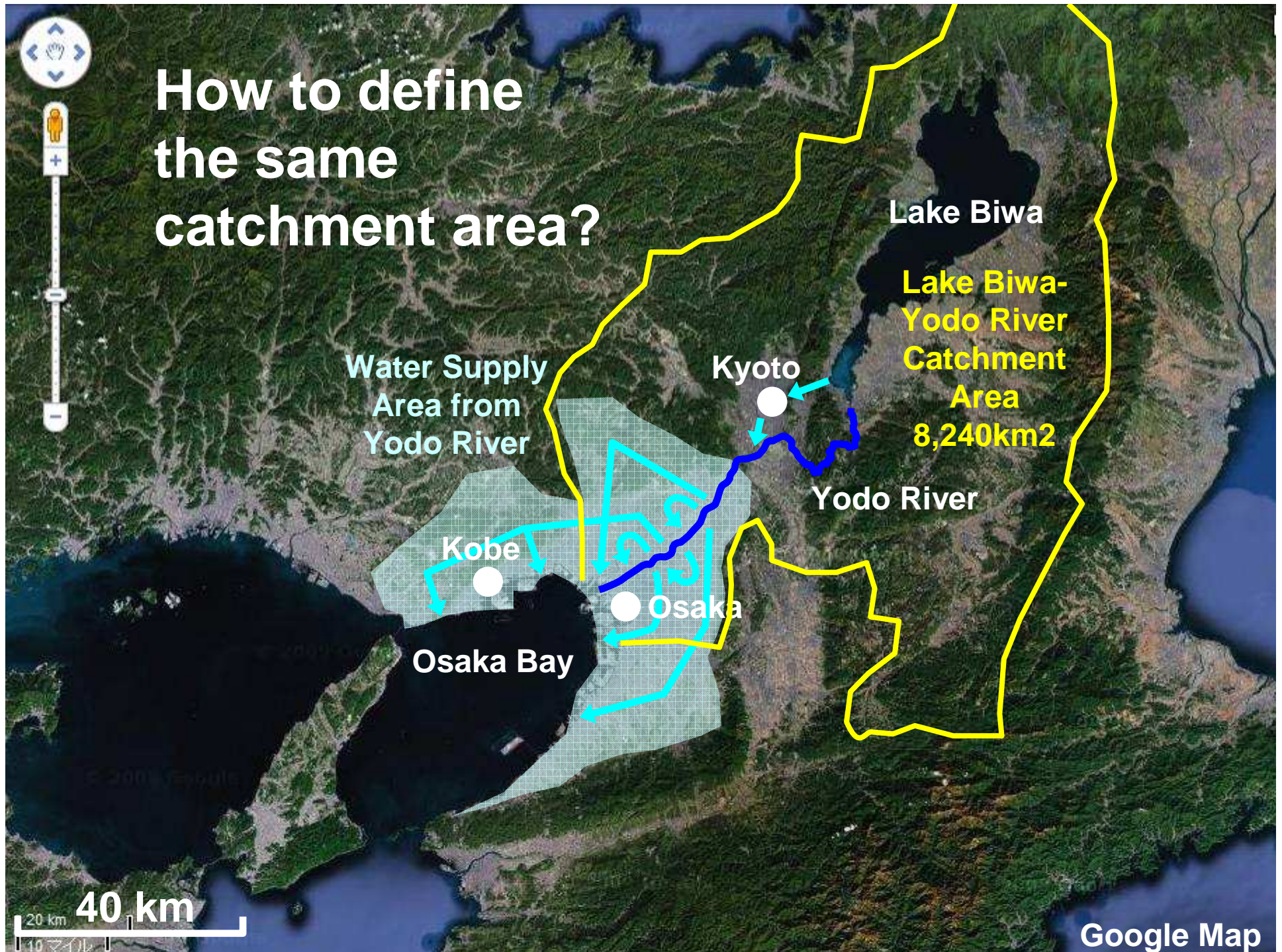
3. Question about the Grey Water Footprint

- Excluding grey water footprint from calculating total water footprint is proposed for the ISO standardization.
- When grey water footprint is excluded, the calculated water footprint does not provide incentives for reducing pollutant discharge or promoting wastewater treatment. However, it may be more appropriate to assess compliance with environmental regulations rather than to assess water footprint which requires complicated calculations.

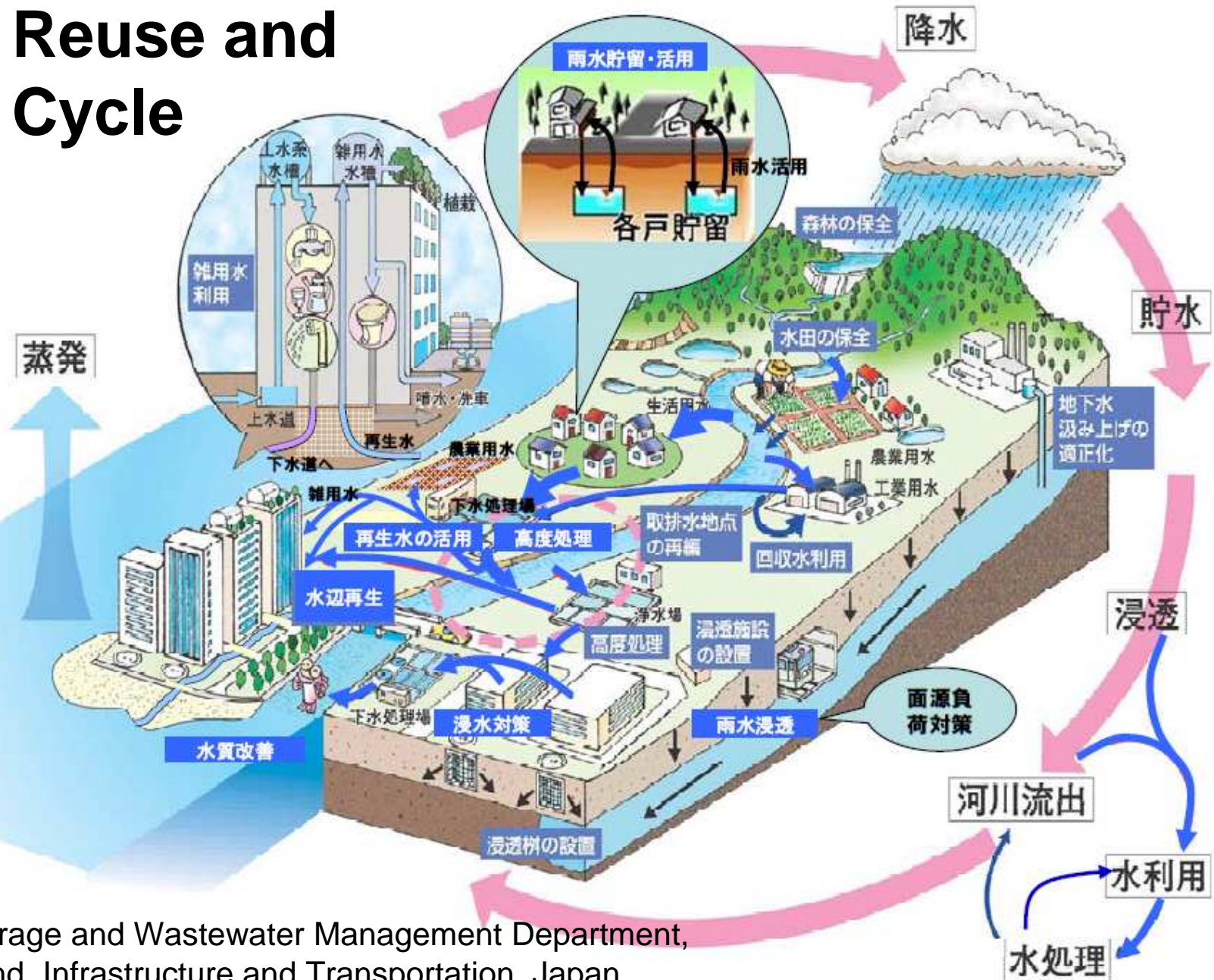
4. Question about the Blue Water Footprint

- According to the WF manual, when used water is properly treated and returned to the original water intake catchment area, the associated blue water footprint can be considered zero.
- However, water rights are secured for such temporarily use of blue water in many cases, and opportunities of water use in upstream areas are exploited. This issue is applied to the case of hydropower generation. It is necessary to figure out how to consider this kind of issue.

How to define the same catchment area?



Water Reuse and Water Cycle



Source: Sewerage and Wastewater Management Department, Ministry of Land, Infrastructure and Transportation, Japan

4. Question about the Blue Water Footprint

- If a factory properly treats used water and discharges the effluent to the original catchment area, the associated blue and grey water footprint is zero.
- But, in urban area where public water supply and sewerage systems are operated, the factory cannot select the location of water intake nor effluent discharge. The factory cannot select the level of sewage treatment, either.
- If the effluent discharge point is in the different catchment area of water intake, the associated blue water footprint is added to the factory.
- Furthermore, if another factory “B” reuses the treated effluent of the sewerage system, how is the blue footprint is counted?
- Since there are various patterns of water flow in actual water use practices, they need to be examined when the definition of water footprint is discussed.

5. Uneven Distribution of Freshwater

- Water distribution is uneven, and the value of water vary in different regions.
(e.g. water scarce country or water rich country)
- The value of water depends on point and time of withdrawal, and type of water.
(e.g. groundwater or surface water)
- In the calculation of water footprint, the value of water used at each location may be incorporated.

6. Relation with Other Environmental Indicators

- The water footprint of a cotton T-shirt is higher than a nylon T-shirt, but it is not appropriate to say that a cotton T-shirt is better than a nylon T-shirt based on that simple fact.
- Wastewater treatment plants can decrease grey water footprint, but increase carbon footprint.
- The necessity of carbon neutral is apparent. But water is different from carbon by its nature. Water may be used within the availability at each location in efficient manners to reduce greenhouse gas emissions.

6. Relation with Other Environmental Indicators

- When assessing environmental impact of products and services, it is necessary to incorporate carbon and ecological footprint besides water footprint, and take account of the balance among 3 types of footprints comprehensively.

6. Relation with Other Environmental Indicators

- When water footprint of a product or service is indicated, it is preferable that other environmental indicators are given simultaneously in order to facilitate wider consideration of environmental impact.

Nestle's Approach in Indicating Water Footprint
Carbon footprint Water footprint



Footprint components of each stage of supply chain

7. Importance of Awareness Raising and Consensus Building toward ISO standardization

- Water Footprint is a new concept. In Japan, awareness on the water footprint and its implications are still low in the private sectors, governments.
- It is important to raise awareness and build common understandings on the implications and impacts of water footprint among concerned stakeholders through discussions on various opportunities during the ISO Standards development process.