

Summary for Overseas Travel WENDI 2018-2019

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Grade	4th
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Travel period	11/03/2019 ~30/03/2019
UN agencies / International organization visited	FAO, Beijing; UNDP, Bangkok; UNEP, Bangkok.
Theme of overseas travel	Environmental conservation and public awareness

Outline of the activities (4 pages including photos, figures, etc.)

(1) Global leadership

Environmental issues lie at one of the most important parts of our life and society. All nations have an important stake in addressing the issues. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member states in 2015 targets “availability and sustainable management of water and sanitation for all”, protection of “water-related ecosystem, including mountains, forests, wetlands, rivers, aquifers and lakes”, sustainable management of “marine and coastal ecosystem”. There is a need for action by all. Global leaders and environmental leaders should support environmental approaches and movements and make the socioeconomic system more harmonious with the environment through scientific technologies and innovations. To make sense of science in politic and policy making process, we need to make multi-connections with governments, institutions, companies and communities. Environmental leaders should also make efforts in raising the environmental awareness of the public by spreading scientific knowledge and supporting the implementation of environmental laws and regulations.

(2) Scientific significance

My current research focuses on freshwater spring habitats and their biological indicators of benthic invertebrates. We conducted a broad-scale survey of benthic invertebrates in springs. By analyzing their taxonomic and their biological habits, we identified spring indicator taxa of benthic invertebrates based on the degree of dependency to groundwater environment. A new classification of springs based on the location of springs in relation to main channel of rivers was proposed for spring habitat assessment. The results of analyzing invertebrate assemblages, indicated that spring contribution (spring size and spring permanence), habitat stability, water quality and the relations to surface water were the factors most responsible for explaining the different patterns of ecological types in the four spring habitats. In the spirit of the theme of this study, it is important to recognize the different types and functions of spring habitats and spring fauna in a river landscape. In the end the decisions and governance frameworks underpinning management practices need to be made by local leaders and stakeholders.

Global leaders and environmental leaders should support environmental approaches and movements and make the socioeconomic system more harmonious with the environment through scientific technologies and innovations. To make sense of science in politic and policy making process, we need to make mufti-connections with governments, institutions, companies and communities. Environmental leaders should also make efforts in raising the environmental awareness of the public by spreading scientific knowledge and supporting the implementation of environmental policies and laws.

The research on public awareness has both theoretical and empirical significance to the scientific community. The theoretical importance of the study lies in demonstrating thoughts and needs of public. Empirically, this study is important in helping researchers and scientists to better understand how to engage with public, which will contribute to improving the environmental education program.

(3) Originality/Universality

Groundwater and subsurface water have important roles in river ecosystems: e.g., stabilizing flow regime and water temperature, supplying nutrients, and increasing biodiversity. However, detection of springs and quantitative estimation of groundwater contribution to the surface water ecosystems are not easy in the field. Although some indirect measurements combining simulations and models have been widely used to estimate the groundwater flow, they require certain assumptions, thus it is rather difficult to estimate the discharge of groundwater oin a local scale. Direct field-scale measurement of groundwater flow is also difficult particularly for researches of ecology and environmental science.

In this study, we present biological indicators of benthic invertebrates to evaluate the contribution of groundwater to surface water bodies. Because the benthic invertebrates show distribution patterns reflecting habitat scale environmental conditions in a sensitive manner, they are expected to serves as a biological indicator of groundwater spring sites. We collected data of benthic invertebrates from literature in a global scale and additional field researches. By analyzing their taxonomic and their biological habits, we identified spring indicator taxa of benthic invertebrates based on the degree of dependency to groundwater environment.

A total of 1,205 aquatic invertebrate species representing 48 orders were found from 123 research sites, with a total of 3,056 occurrences of species in the data. The spring indicators were identified as spring dependent species including groundwater species (Stygobites & Stygophiles), cave species (Troglobites & Troglophile), and stenothermal species. Considering with the geographical distribution patterns of the spring indicator taxa , stenothermal species were classified into “cold stenothermal species” which evolutionarily originate in more boreal regions and “warm stenothermal species” derived from more tropical regions. Ecological interpretation of these stenothermal species was discussed in relation to climatic zones and altitude of the basin concerned. Based on the variations of spring contribution into river ecosystems suggested by the spring indicator species, we proposed an application procedure of the spring indicators to for environmental assessment and nature conservation works in river management.

In order to feedback the research results to the society, environmental education activities were planned as a project based research. There are different types of environmental education activities and program which have been conducted in Japan so far. I have participated in environmental education activities in Kyoto (Kamo River, Takano River and Midorogaike) and Shizuoka (Kakida River). These activities educated students and citizens by sampling and identifying benthic invertebrates from rivers, ponds and springs. It aims to promote opportunities for environmental education, which is driven by scientific knowledge and current research outcome, strengthening the interface between science and society.

The targets are foreign tourists who travel to Japan. According to Japan National Tourism Organization (JNTO), the estimated number of international travelers to Japan in January 2019 was about 2.7 million (+7.5% from the previous year, +180,000 travelers), recording the highest figure for January. The foreign tourists have certainly become an important part of Japanese society. The tourist boom is spreading the economic benefits to Japan. It also brings us an opportunity to know each other, including exchanging our understanding and ideas about environmental conservation. For many eco-tourism cases, there are often environmental problems coming along with the economic benefits. So far in Japan, there is few studies about this, but using the chance we can try to answer some questions: when the international travelers come to Japan, how do they consider about the nature and environment in Japan? Will the trip influence their environmental awareness? Can we expand the scientific and environmental knowledge to the international travelers using the chance of tourism?

To answer the questions, firstly, we need to conduct a questionnaire research towards the international tourists. Since there are a large number of Chinese tourists in Japan every year, we planed to conduct a questionnaire research in China. The aim of this oversea travel is to conduct a survey on public awareness on environmental issues. The survey was conducted in Qingdao and Beijing, China.

Based on the questionnaire results, we will design the questionnaire for Chinese tourists in Japan. After that, we will have a workshop to discuss the possibility and options of conducting experience activities for international tourists for the purpose of environmental education. The workshop will invite foreign tourists, local residents, international students, researchers and local organizations of tourism and environmental conservation groups. The aim of the workshop is to design environmental education experience activities which can expand the scientific and environmental knowledge to foreign travelers in the way of tourism.

(4) Reasons and motivations for visiting UN agencies / International organizations

I have visited FAO in Beijing, UNDP and UNEP in Bangkok. The purpose of visiting the international organizations is to learn more information and experiences regarding environmental policy implementation and environmental education activities. All the information will be used as references for the PBR activity in 5th year.

In the meeting with staff from FAO (Beijing), there were brief introductions about projects on educating citizens and farmers about environmental issues. I have learned that Chinese government has launched several program on teaching local farmers about how to use pesticides and fertilizers in an

environment friendly way. China has also made efforts in introducing high-tech into agriculture fields. Knowing the current and future government policies are important for researchers and scientists to apply their outcomes to society. In the meeting with staff from UNDP and UNEP in Bangkok, I had the similar information about cooperating with governments. Meanwhile, raising public awareness is pointed as an important part towards policy making and implementing process. If public can better understand the importance of environmental conservation, it will promote the work and project conducted by institutions and governments. Therefore, when we consider the solution of environmental issues, it is important to recognize the possible options and researchers would best serve this decision making process by providing research outcomes and suggestions in the form of policy alternatives to decision-makers who can then set up the priorities among different courses of plans.

