



Analysis of regional sustainability for SDGs in Japan from the perspective on Water-Energy-Food Nexus

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The United Nations has established 17 Sustainable Development Goals (SDGs), and the key factor of SDGs is to assess the holistic impacts of socio-economic and environmental issues. However, these issues are highly dependent on regions, thus characteristics by regions in terms of Water-Energy-Food (WEF) Nexus, which is well known for analyzing the inter-linkages among resources, should be considered for SDGs. In this study, we assessed the regional sustainability of 47 prefectures in Japan using the normalized indices relating to WEF Nexus, which are energy security, renewable energy, food security, groundwater and surface water use etc. After then we analyzed the possible regional issues for accomplishing SDGs in each prefecture. For example, Tokyo and Aichi prefectures showed the high levels of population and GDP per capita, however, both prefectures import a lot of rice from other prefectures such as Niigata, Akita, and Hokkaido. Therefore, the trade-offs between food security and economic growth could be regarded as main issues for SDGs in these prefectures. In terms of water management, Niigata prefecture is highly dependent on surface water in public water supply and a lot of irrigation water is used for paddy rice at the same time. In addition, Niigata is the 4th largest prefecture of electricity generation by hydro-power. Therefore, water allocation for food, energy and public water could be an issue for SDGs from viewpoints of WEF Nexus. Shizuoka and Gifu prefectures showed the high levels of groundwater dependency in both public water and industrial water supply, thus groundwater management could be discussed as a main issue for SDGs.