# SUMMARY OF SCIENTIFIC AND TECHNOLOGICAL ACTIVITIE OF

## Promising Research Initiatives in HU for Healthy Urban - Rural cycle in Setouchi to Asian catchments, toward SDGs (HURuSAto)

## And

## Research Center of HU for Healthy Watershed Environment (HeWe)

## I. ESTABLISHMENT AND SCOPE

Project Research Center for Healthy Watershed Environment is the Research Consortium established on November 1st, 2018 for the on-going Projects supported by JSPS[*1] and APN-GCR[*2], and it holds the research collaboration agreement with Japanese members in Okayama Univ. and Miyagi Univ. and Indonesian researcher in Indonesian Institute of Sciences. In addition, Promising Research Initiatives in HU for Healthy Urban - Rural cycle in Setouchi to Asian catchments, toward SDGs was established on July 1st in 2020 as more wide research consortium, to collaborate with the members from other Japanese and foreign research institutions and to accomplish the transdisciplinary research projects.

[*1]: JSPS is Japan Society for the Promotion of Science. (https://www.jsps.go.jp/index.html)

[*2]: APN-GCR is Asia-Pacific Network for Global Change Research. (https://www.apn-gcr.org/)

Project Research Center for Healthy Watershed Environment and the another one are a non-governmental, and they are responsible for fully implementing the policies, laws, and regulations of Hiroshima University.

Scope of operation of the Consortiums:
a. Scientific research: Scientific research, application of science and technology, technological transfer in the fields of hydrology, agriculture, environmental protection, sustainable development and resource management.
b. Construction, deployment and management in projects in fields: Sustainable Development and Resource management, Environmental Protection, Biodiversity Conservation, Climate Change.
c. Scientific and technical services: Planning and survey of natural resources and environment, Counseling and social assessment, Environmental communication and education, Training and practice, Translation and interpretation in the field of natural resources and environment.

## II. MAIN MEMBERS

(Head) Onodera, Shin-ichi: Hiroshima University, Graduate School of Advanced Science and Engineering, Professor, Environmental Science

Tanaka, Takahiro: Hiroshima University, Graduate School of Advanced Science and Engineering, Professor, City Planning
Yamada, Toshihiro: Hiroshima University, Graduate School of Integrated Sciences for Life, Professor, Tropical Forest Ecology
Koike, Kazuhiko: Hiroshima University, Graduate School of Integrated Sciences for Life, Professor, Coastal Ecology
Nagasaka, Itaru: Hiroshima University, Graduate School of Humanities and Social Sciences, Professor, Cultural Anthropology
Sugiki, Tsunehiko: Hiroshima University, Graduate School of Humanities and Social Sciences, Professor, Religion
Sakuno, Yuji: Hiroshima University, Graduate School of Advanced Science and Engineering, Associate Professor, Satellite Engineering
Iwamoto, Yoko: Hiroshima University, Graduate School of Integrated Sciences for Life, Associate Professor, Atmospheric Chemistry
Ishida, Takuya: Hiroshima University, Graduate School of Advanced Science and Engineering, Assistant Professor, Biogeochemistry
Ohara, Shizuka: Hiroshima University, Graduate School of Integrated Sciences for Life, Assistant Professor, Coastal Ecology
Saito, Mitsuyo: Okayama University, Graduate School of Environmental and Life Science, Associate Professor, Hydroecology
Shimizu, Yuta: NARO, Western Region Agricultural Research Center, Researcher, Agricultural Environmental Science, Agricultural Hydrology
Matsuo, Kaoru: Osaka Prefecture University, Assistant Professor, City Planning
Yokoyama, Makoto: Fukuyama City University, Assistant Professor, City Planning
Kawashima, Shigekazu: Miyagi University, School of Food Industrial Sciences, Professor, Environmental Socio-Economy

[International Member]

Ridwansyah, Iwan: Indonesian Institute of Sciences, Research Center for Limnology, Senior Researcher, Environmental Hydrology
Yulianto, Eko: Indonesian Institute of Sciences, Research Center for Geotechnology, Director, Tsunami Disaster Research
Hernawan, Udhi: Indonesian Institute of Sciences, Research Center for Oceanography, Senior Researcher, Marine Ecology
Hidayat, Yayat: Bogor Agricultural University, Associate Professor, Watershed management
Siringan, Fernando: University of the Philippines Diliman, Professor, Marine and coastal geology
Jaraula, Caroline: University of the Philippines Diliman, Assistant Professor, Environmental biogeochemistry
Chen, Jianyao: San Yat Sen University, Professor, Hydrogeology
Jin, Gungzhe: Guangdong Ocean University, Associate Professor, Biogeochemistry
Zhu, Aiping: Anhui Normal University, Associate Professor, Biogeochemistry
Hirata, Ricardo: University of Sao Paulo, Professor, Hydrogeology

**III. EXPERIENCE AND RELATED ACTIVITIES**

<u>On-going Projects;</u>

1. JSPS, Grant-in-Aid for Scientific Research (A), 2018-04-01–2022-03-31, Innovation of catchment agriculture and environment, based on regional recycle system conserving coastal ecosystem and agricultural land, 18H04151, PI: Onodera, S., Co-I: Saito, M., Kawashima, S. et al.
2. APN-GCR, 01/09/2019-31/07/2022, Future water resources, its quality management and nutrient flux in Asian coastal megacities, CRRP2019-09MY-Onodera, PI: Onodera, S., Co-I; Saito, M., Ridwansyah, I., Bakti, H., et al.
3. JSPS, Grant-in-Aid for Scientific Research (B), 2018-04-01–2021-03-31, Evaluation of the groundwater impact on the diversity production in coastal environment: Toward the conservation of seagrass ecosystem services, 18H03411, PI: Saito, M., Co-I: Onodera, S., et al.

Completed Projects:

1. JSPS, Grant-in-Aid for Scientific Research (B), 2017-04-01–2020-03-31, Evaluation of groundwater vulnerability for sustainable water use in various Indonesian coastal cities, 17H04494, PI: Onodera, S., Co-I: Saito, M., et al.
2. JSPS, Grant-in-Aid for Scientific Research (B), 2016-07-19–2019-03-31, Evaluation of food cycle and its sustainability between extensive agricultural and urban areas focusing on the nitrogen cycle, 16KT0033, PI: Fukuoka, M., Co-I: Saito, M., et al.
3. JSPS, Bilateral Joint Research Projects between Japan and China, 2016-04-01–2018-12-31, Effects of nutrient discharge and its accumulation on the intensity of coastal pollution with progress of urbanization, PI: Onodera, S., Co-I: Saito, M., et al.

Peer-reviewed publications and presentations;

1. Rusydi, A.F., Onodera, S.I., Saito, M. et al. (2021) Potential Sources of Ammonium-N in the Coastal Groundwater Determined from a Combined Analysis of Nitrogen Isotope, Biological and Geological Parameters, and Land Use. Water, 13(1): https://doi.org/10.3390/w13010025.
2. Ioka, S., Onodera, S-I., Saito, M., et al. (2021) Species and potential sources of phosphorus in groundwater in and around Mataram City, Lombok Island, Indonesia. Springer Nature Applied Science, 3(27). https://doi.org/10.1007/s42452-020-03975-6.
3. Rusydi1,A., Onodera, S., Saito, M. et al. (2021) Vulnerability of groundwater to iron and manganese contamination in the coastal alluvial plain of a developing Indonesian city., Springer Nature Applied Science, 3(339), https://doi.org/10.1007/s42452-021-04385-y.
4. Nozaki, S., Onodera, S. et al. (2021) Spatial distributions in groundwater discharge on various tidal flats in a small and steep island, western Japan. International Journal of GEOMATE, Vol.20, Issue 81, pp.66-71.
5. Kimbi, S., Nozaki, S., Onodera, S. et al. (2021) Impact of citrus agriculture on the quality of water resource in a small steep island, Seto Inland Sea, Japan. International Journal of GEOMATE, 2021
6. Jin,G, Onodera,S, et al. (2020) Sediment phosphorus cycling in a nutrient-rich embayment in relation to sediment phosphorus pool and release, Limnology, 21(3), 415–425.
7. Onodera,S. et al. (2020) Phosphorus cycling in watersheds: from limnology to environmental science, Limnology, 21(3), 327-328.

8. Ridwansyah I, Yulianti M, Apip, Onodera S, et al. (2020) The impact of land use and climate change on surface runoff and groundwater in Cimanuk watershed, Indonesia, Limnology, 21(3), 487-498.
9. Shimizu,Y., Onodera,S., et al. (2020) Effect of in-stream impoundment on water quality of a suburban stream, , Limnology, 21(3), 393-402.
10. Saito, M., Okuda, N., Onodera, S. (2020) Material transport and cycle in watersheds: toward the interdisciplinary collaboration between limnology and the other research disciplines, Limnology, DOI: 10.1007/S10201-020-00632-0.
11. Ye, Z., Chen, J., Gao, L., Liang, Z., Li, S., Jin, G., Shimizu, Y., Onodera, S. et al. (2020) $^{210}$Pb dating to investigate the historical variations and identification of different sources of heavy metal pollution in sediments of the Pearl River, Southern China, Marine Pollution Bulletin, 150, 110670.
12. Zhu, A., Saito, M., Onodera, S., et al. (2019) Evaluation of the spatial distribution of submarine groundwater discharge in a small island scale using the $^{222}$Rn tracer method and comparative modeling, Marine Chemistry, 209, 25-35.
13. Rusydi, A., Saito, M., et al. (2019) Estimation of ammonium sources in Indonesian coastal alluvial groundwater using $Cl^-$ and GIS, International Journal of GEOMATE, 17(62), 53-58.
14. Tomozawa, Y., Onodera, S. and Saito, M. (2019) Estimation of groundwater recharge and salinization in a coastal alluvial plain and Osaka megacity, Japan using $\delta^{18}O$, $\delta D$, and $Cl^-$, International Journal of GEOMATE, 16(56), 153-158.
15. Takeuchi, T., Onodera, S. et al. (2019) Estimation of sedimentation rate and fresh-saline environment in a coastal alluvial plain, using boring cores of alluvium in the central part area of Seto Inland Sea, Japan, International Journal of GEOMATE, 17(60), 70-75.
16. Haque, S. J., Onodera, S. et al. (2019) Surface water nitrogen load due to food production-supply system in south Asian megacities: a model-based estimation, Advances and Trends in Agricultural Sciences, 1, 123-132.
17. Saito, M., Onodera, S. et al. (2018) Nitrogen dynamics in a highly urbanized coastal area of western Japan: impact of sewage-derived loads, Progress in Earth and Planetary Science, 5:17, DOI: 10.1186/s40645-018-0177-6.
18. Onodera, S., et al. (2018) Water environment in the Seto Inland Sea watersheds: Sato-Mizu, KIBITO PUBLISHING, 266p (in Japanese).
19. Otake, H., Onodera, S., et al., (eds.) (2017) Dictionary of Phosphorus, Asakura Publishing Co., Ltd (in Japanese).
20. Jin, G., Onodera, S. et al. (2016) Vertical distribution of sediment phosphorus in Lake Hachirogata related to the effect of land reclamation on phosphorus accumulation, Environmental Technology, 37, 486-494.
21. Shimizu, Y. and Onodera, S. (2016) Estimation of the nitrogen load to groundwater using the nitrogen flow model, Yamashita, A. (ed.), Urbanization and the Environment in Asia: Land Use Data Analysis, University of Tsukuba publication meeting, 133–156 (in Japanese).

22. Shimizu, Y., Onodera, S., et al. (2016) Estimation of Nutrient Fluxes from Suburban Watersheds in Japan using the SWAT Model: Current Issues and Future Directions, The Challenges of Agro-Environmental Research in Monsoon Asia, NIAES Series, 6, 227–236.
23. Kawashima, S., et al. (2016) Econometric Analysis of Farming Land Abandonment in the Tohoku Region Using Community-Level Data, Journal of Rural Economics, 88(3), 287-292 (in Japanese with English abstract).
24. Kawashima, S. (2016) Factor analysis and prospects of the abandoned land problem, Tohoku agricultural research promotion council in summer, Tohoku Agricultural research center, National Agriculture and Food Research Organization (invited lecture).

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Date_____