# A Trans-Disciplinary Approach to Regional Planning Simulation Using Renewable Energy Clusters

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## 1. Objective

**This project is aimed at:**

Developing countries are facing a challenge to create a new vision for regional development for their future. This vision consists of regional development plan, industrial cluster plan, and an ideal life style in residences with sustainability. Ideal future regional development plans can be integrated by utilizing regional resources. Southeast Asia is one of the most resource-rich regions: it has a huge amount of forest area, which is a large natural resource for renewable energy. Our project aims create an ideal future development plan for developing countries by creating carbon neutral energy, regional cluster of industry, future standard of lifestyle and high quality tourism. This project will also create a science-integrated simulation model of regional industries clusters and regional development plans for developing countries. We will simulate and create a future development plan for local governments.

## 2. Project Outline

**To that end, the project will consist of the following phases:**

This project will create a future development plan for local governments/regions of developing countries. Industrial clusters of renewable energy will be investigated to determine whether it is feasible for the regions of developing countries in a specific country and region, and will investigate the impact of future development.

(a) Investigation of regional resources and societal aspects

We will investigate the overall characteristics of a selected region/local government in some developing country, including natural resources, societal structure, industrial structure, social issues to be resolved, culture, public perception and regional climate. We also investigate available new and high technology applicable to the region.

(b) Creation of an economic model with input-output table associated with physical development plan

By downscaling from the national input output table, we will create a regional I-O table and a related inter-regional I-O table. We will also investigate means of describing a development plan in that I-O table.

(c) Research on new concepts of societal structure and life style

We will discuss ideal future life styles and societal concept with local citizens of the region. We will also create a psychological model of public satisfaction to evaluate lifestyle and regional development. The model will be also implemented in an I-O table.

(d)  Simulation of current economy and society

With the developed economic model with input-output table associated with the physical development plan, we will simulate the current state of the regional economy to assess the applicability of the model. Then, we will apply the model to the future plan for the region to anticipate the impact of the plan, including the renewable energy industrial cluster.

(e)  Creation & Simulation of New Regional Policy

We will investigate various development plans, and especially a renewable energy strategy, to select the best development plan for the region.


## 3.  Expected Performance

**In this project, the successful candidate would be expected to:**

(a) Have the ability to understand and integrate sciences of various fields from engineering to economics, and psychology.
(b) Be able to create inter-disciplinal and trans-disciplinal simulation models and programming.
(c) Be enthusiastic about learning Japanese, and English conversation


## 4.  Required Skills and Knowledge

**The successful candidate for this project will have the following knowledge and skills:**

(a) Basic knowledge of civil engineering and economics.
(b) Computational programming knowledge and skill.
(c) Basic psychology knowledge.
(d) Research experience in policy making

**References**

Harkunti P. RAHAYU and Seigo NASU (2011), Logic Model of People's Mind toward Tsunami Early Warning, Proceedings of IESL-SSMS Joint International Symposium on Social Management Systems 2011, Colombo Sri Lanka, September 14-16, 2011

Harkunti P. RAHAYU and Seigo NASU (2010), Restructuring Assessment Indicators for Tsunami Preparedness System for Indonesian Cities, Proceeding of International Comparative Policy Analysis Forum affiliated with Journal of Comparative Policy Analysis, Pittsburgh USA, April 22-23, 2010

Harkunti P. RAHAYU and Seigo NASU (2010), Good Practices of Enhancement Early Warning System for High Populated Cities – A case Study for Jakarta Flood, Proceedings of Symposium on Social Management Systems 2010, Kochi Japan, March 10-11 2010

P. Suttinon, S. Nasu, T. Ihara, N. Bongochgetsakul, and K. Uemoto
"Water Resources Management in Shikoku Region by Inter‑Regional Input‑Output Table"
(Review of Urban & Regional Development Studies, Volume: 25 no.2, pp. 107-127, 2013, Publisher: John Wiley & Sons, Inc.)

Suttinon, P., Bhatti, A,M., and Seigo, N
"Option Games in Water Infrastructure Investment"
(ASCE's Journal of Water Resources Planning and Management, 138(3): 268-276, ASCE, USA, 2011)

Suttinon, P., and Seigo, N.
"Real Options for Increasing Value in Industrial Water Infrastructure"
(Water Resources Management, 24(12): 2881‑2892, Springer 2010)

Development of Decision Making System for Water Resource Policy under Climate Change in Shikoku Area.
("Research Program on Climate Change Adaptation (RECCA)," Ministry of Education, Culture, Sports, Science and Technology)
http://www.mext-isacc.jp/eng/staticpages/index.php/report_nasu_e

Published Papers [Principal Researcher: Seigo Nasu]
http://www.mext-isacc.jp/eng/staticpages/index.php/papers_nasu_e

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