RESPONSIBLE PORT INNOVATION
By PhD Researcher: B. Adhi Priyambodho

Main questions in the dissertation project are:
- How to reconcile diverging, competing and/or conflicting values?
- Which methods could be used or developed for that purpose?
- How could Responsible Port Innovation be applied in practice?

The goal of this project is to develop a Responsible Port Innovation methodology and strategy. In the project, case-studies are made in order to find answers. One of these cases is the Jakarta port development. The study focuses on the present multi-faceted Garuda plan and especially applies Social Impact Assessment (SIA) and Cost Benefit Analysis (CBA).

Focused on ethical values, Responsible Innovation is a good motor of economic growth and employment. This research project aims to address the challenges for the future of world port cities in a responsible way. First and foremost, Responsible Port Innovation starts with involving the public, stakeholders and their perspectives and values. Responsible Innovation has many aspects, and this project especially concerns sustainability and environmental protection, beside economics and technology.

"Responsible Innovation is an issue for all stakeholders and requires communication, information exchange and collaboration at early levels when a dispute can still be made in the design of systems, infrastructure and high cost of failure and public rejection can still be prevented" (Van den Hoven, 2012).

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Responsible Port Innovation

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Adhi graduated from the Department of Civil Engineering at Gadjah Mada University (UGM) and continued his studies taking the master programme of civil engineering at Diponegoro University (UNDIP). After receiving his master degree, he was a Junior Lecturer at the Engineering Faculty, Civil Engineering Department, UNTIRTA, Indonesia and then started his PhD research at Delft University of Technology (TU Delft) which is about “Responsible Port Innovation”. He started to work at TU Delft as a PhD researcher with Dr. Wim Ravesteijn (Assoc. Prof) as daily supervisor and Prof. Dr. ir. I.R. van de Poel (Ibo) as promotor. For the Jakarta Port research project Adhi working together with Caiyan Qin, master student from Harbin Institute of Technology, China.

A. Content of the research

A world port city can be conceptualized as a centre in several senses, like a place where groups of domestic and international people come together, of growth in terms of logistical and supply chains, a place at the crossroads of accountability, compliance and law enforcement systems (e.g. customs, tax and policing, safety). Such cities are meeting points of communities from different nationalities and spiritual and cultural backgrounds. They are places where investments and capital as well as manpower, are brought together for economic growth. Places where maritime traditions are continued with plans for future development. And they are both hotspots of cultural conservation and technological innovation, including Responsible Innovation (RI), which “…refers to ways of proceeding in Research and Innovation that allow those who initiate and are involved in these processes at an early stage (A) to obtain relevant knowledge on the consequences of the outcomes of their actions and on the range of options open to them and (B) to effectively evaluate both outcomes and options in terms of ethical values (including, but not limited to well-being, justice, equality, privacy, autonomy, safety, security, sustainability, accountability, democracy and efficiency) and (C) to use these considerations (under A and B) as functional requirements for design and development of new research, products and services” (European Commission 2013).

Focussed on ethical values, Responsible Innovation is a good motor of economic growth and employment. This project aims to address the challenges for the future of world port cities in a responsible way. First and foremost, Responsible Port Innovation starts with involving the public, stakeholders and their perspectives and values. Responsible Innovation has many aspects, and this research project especially concerns sustainability and environmental protection, beside economics and technology.

The goal of this project is to develop a Responsible Port Innovation methodology and strategy. The project is especially focussed on ways of dealing with a variety of engineering and stakeholder values.

Main questions in the project are:
- How to reconcile diverging, competing and/or conflicting values?
- Which methods could be used or developed for that purpose?
- How could Responsible Port Innovation be applied in practice?
In the project, case-studies are made in order to find answers. One of these cases is the Jakarta port development. The study focusses on the present multi-faceted Garuda plan and applies Social Impact Assessment (SIA) and Cost Benefit Analysis (CBA). The Rotterdam Port Maasvlakte 2 project will serve as a reference case.

B. Research content

Area: Greater Jakarta is the 2nd largest urban area in Indonesia (Jabodetabek), consisting of several districts and/or cities, like Jakarta, Bogor, Depok, Tangerang and Bekasi. The total population of Jabodetabek is around 30-35 million people. Bogor and Depok are situated on higher ground than Bekasi, Tangerang and Jakarta, resulting from neighboring volcanoes 2000-3000 meter above sea water level (SWL).

Problem field:
1. Lack of spatial planning, flooding, a deficient water supply, it is a catchment area for high rainfall, the water quality in the district/region is insecure, there is a lot of solid waste in the small and big rivers, decrease of green area, and traffic jam.
2. Difficult access by road: the Jakarta government is reluctant to expand the road network for fear of more traffic congestion,
3. Tanjung Priok Port cannot handle big ships,
4. Lack of capacity and space to expand, including resistance from the local community.

Concept of Integrated Solution

**High Quality of Life**
- Clean
- Safe

**Growth**
- Inclusive
- Balanced
- High value-

**Eco-Friendliness**
- Low Carbon
- Energy

A. Better Urban Environment

A.1. Development of MRT-based New Urban Transport System
A.2. Development of Road Network
A.3. Promotion of Urban Re-Development,
A.4. Improvement of Water Supply And Sewerage System,
A.5. Solid Waste Treatment,
A.6. Flood Management,

B. Low-Carbon Energy

B.1. Development of Cilamaya Port,
B.2. Improvement of Tj.Priok Port,
B.3. Development of New International Airport,
B.4. Improvement of Soekarno-Hatta International Airport,

C. Multiple

C.1. Low-Carbon Power Supply Development.
C.2. Development of Smart Grid

Application of the Integrated Solution:

The Garuda Plan (see figure 4-6), called “The Great Garuda”, will be a project in a densely populated area. In the planning, they are considering population density, potential land-uses, functions, activities, the creation of neighborhoods, the character of streets and spaces, and visual and physical connections and associations. Mapping densities, green space areas, the catchment area and transportation facilities are considered in the design of the Great Garuda. The Jakarta Port has been designed to be able to serve larger and larger vessels up to 2030.
The NCICD (National Capital Integrated Coastal Development) concept aims and promises to solve the problems, not only with regard to the Jakarta Port capacities, but also other issues, offering solutions like: sea dikes to protect Jakarta from flooding; toll roads to service the rapidly increasing numbers of cars, trucks, and busses; railways & (MRT) Mass Rapid Transport to reduce traffic jams causing considerable economic losses; sanitation & drainage networks preventing flooding.

The NCICD infrastructure plan shall be integrated with other existing plans, including:
1. JCDS Jakarta Coastal Defense Strategy 2012
2. Masterplan of the Ciliwung–Cisadane area
3. Integrated Transportation Master Plan Study of Jabodetabek / SITRAM (Phase II)
4. Port Master Plan for Tanjung Priok
5. Jakarta Sewerage and Sanitation Master Plan (Review 2011)
Fig 6. The Garuda Plan based on NCICD
the Central Business District

B. The Wing Connections

C. Proposed new Jakarta Port

In the dissertation project, Responsible Innovation research into the Jakarta Port area and plans includes impact assessment and the evaluation of the outcomes in view of project goals and stakeholder values. The Garuda Plan will be assessed with Social Impact Assessment (SIA) and evaluated with Cost Benefit Analysis (CBA).

D. Possible recommendations
The development of Tanjung Priok consists of three stages:
1. Short-term (2012-2017) : the construction of a container terminal (phase one), will be assessed in stage 2 : construction/implementation,
2. Medium-term (2018-2023) : container terminal (phase two),
3. Long-term (2024-2030): container terminal (phase three),
Medium and long term plans will be made on the basis of the experiences in stage 1: planning/policy development. The Social Impact Assessment research could lead to recommendations to be used in the policy and decision making processes.