

## RESEARCH SUMMARY

### SUSTAINABLE CITIES IN THE NETHERLANDS: *Urban Green Spaces Management in Rotterdam*

Choerunisa Noor Syahid, Ayu Nova Lissandhi, Kurnia Novianti, Abdul Fikri Angga Reksa

*Research Center for Regional Resources  
Indonesian Institute of Sciences, Jakarta, Indonesia  
Corresponding Author Email: c.runisa@gmail.com*

#### Abstract

One of the challenges of sustainable urban development is to provide a viable environment for the population following the function of space and community activities within it. Research on green space in the Netherlands is important as a response to the global environmental crisis as well as the realization of sustainable development. This research uses an interdisciplinary approach through the analysis of the phenomena of spatial management in the context of local-global sustainable urban development. An interdisciplinary approach is used because the issue of "sustainable cities" is multidimensional, so it takes more than one perspective in reviewing it, in this multidisciplinary research involved among others anthropology, urban social planning and sociology. Based on the research problem formulated, the science perspectives are expected to answer the question of how space is interpreted, negotiated and become a vehicle for the distribution of sustainable development ideas. This dynamic also captures the context of green space management so that this study contributes to enriching theoretical studies on the construction of urban spaces. This research question is answered through qualitative methods of collecting primary data through interviews, focused discussions and observations, as well as searching related literature as secondary data. The result of this study found that the attention of the Dutch environmental policy has also regulated spatial management, primarily related to "space" as part of human activities and has environmental and social impacts. Spatial policy in the Dutch context is articulated as a place of negotiation embodied in the EU's global and regional collective consensus.

**Keywords:** green space, sustainable city, Rotterdam, Netherlands.

#### Abstrak

Salah satu tantangan pembangunan kota berkelanjutan adalah untuk menyediakan lingkungan yang layak bagi penduduk sesuai dengan fungsi ruang dan kegiatan masyarakat di dalamnya. Penelitian tentang ruang hijau di Belanda penting sebagai respons terhadap krisis lingkungan global serta realisasi pembangunan berkelanjutan. Penelitian ini menggunakan pendekatan interdisipliner melalui analisis fenomena manajemen spasial dalam konteks pembangunan perkotaan berkelanjutan lokal-global. Pendekatan interdisipliner digunakan karena masalah "kota berkelanjutan" bersifat multidimensi, sehingga dibutuhkan lebih dari satu perspektif dalam mengkaji ulangnya, dalam penelitian multidisiplin ini meliputi antara lain antropologi, perencanaan sosial perkotaan dan sosiologi. Berdasarkan masalah penelitian yang dirumuskan, perspektif ilmu diharapkan untuk menjawab pertanyaan tentang bagaimana ruang ditafsirkan, didelegasikan dan menjadi kendaraan untuk distribusi ide-ide pembangunan berkelanjutan. Dinamika ini juga menangkap konteks pengelolaan ruang hijau sehingga penelitian ini berkontribusi

*untuk memperkaya studi teoritis tentang pembangunan ruang kota. Pertanyaan penelitian ini dijawab melalui metode kualitatif pengumpulan data primer melalui wawancara, diskusi dan pengamatan terfokus, serta pencarian literatur terkait sebagai data sekunder. Hasil penelitian ini menemukan bahwa perhatian terhadap kebijakan lingkungan Belanda juga telah mengatur manajemen tata ruang terutama terkait dengan "ruang" sebagai bagian dari kegiatan manusia dan memiliki dampak lingkungan dan sosial. Kebijakan spasial dalam konteks Belanda diartikulasikan sebagai tempat negosiasi yang diwujudkan dalam konsensus kolektif global dan regional UE.*

**Kata Kunci:** ruang hijau, kota berkelanjutan, Rotterdam, Belanda.

## INTRODUCTION

This research is a continuation of two types of research ago (2015-2016) which has a theme about the interpretation of the concept and implementation of "sustainable city" policy and Rotterdam as a resilient city with a continuous flood. Rotterdam from a network of 100 cities resilient is position 1 for people, fifth position for the planet and 11th position for profit. Vulnerable seascape conditions with large rivers (maas and Rhine) and one-third of its territory under sea level have implications for ecological space planning exercises. Climate change, post-industrial municipal transformation and the growing number of residents in large cities bring the direction of this research to the scope of management that requires the environment. Space is not only governed by spatial policy but how city space becomes part of the activities of actors and has an environment in Rotterdam.

The sustainable city has become a global concern, especially since the launch of "Sustainable Development Goals" in several indicators by the end of 2015. The big issue raised is how the city needs to strategize a number of actions and programs to build resilience, both socially, economically and environmentally coherent. The current calculation of development success is based not only on how economic growth continues to increase but also emphasizes the value of environmental and social sustainability. According to studies conducted, each region has its own "time zone" in realizing the concept of sustainable development composed of active indexes. It concerns the process of formation as a city with a long history, and the relationship between human activity and its environment are intertwined in the form of access to development material. The use of land use and

spatial change policy is analyzed through a public participation framework as an integral part of sustainable development. This study will contribute to the expansion of the meaning of sustainable cities into a dialectical space.

One of the challenges of sustainable development is the growing number of people in urban areas with their activities. The Dutch environmental policy concerns have also regulated spatial management, especially those related to "space" as part of human activities and pollution generated. Space articulated as an extension of a place is the result of negotiation between individual perceptions that form a collective consensus. It requires a study of the re-conceptualization of relationships (Nature-Culture) according to Dutch policy in a systematic manner, starting from human activities that impact the environment to be one of the issues of sustainable urban development. This study places the Netherlands as a country that influences infrastructure development, city planning, and a globally integrated environment.

The study focused on how to re-conceptualize relationships (Nature-Culture) in the context of urban space with urban ecological approaches and policies. Development is defined as efforts to prosper the community, consisting of human activities that have environmental impacts that require the management of zonation by considering the needs of dynamic citizens. They interpret the green spaces aimed at improving the quality of life in big cities in countries known to contribute to the idea of Environmental Space in a global context.

Considering the concept, this study of the management of green space in Rotterdam within the framework of this sustainable city

refers to the political, ecological perspective of human agencies in urban and green, arboreal and green space parks in urban landscapes and the actions and interventions of urban forests. The findings of this study are how Rotterdam became part of the global environmental policy network as a result of the construction of urban environmental agencies established through regional powers, local knowledge, ecological experience, innovative local initiatives, educational institutions and professional institutions.

Based on this rationale, this research question will discuss:

- 1) How is the realization of green space in Rotterdam urban land interpreted in the framework of 'sustainable cities' policy?
- 2) How does the green zoning policy contribute to meeting the needs of Rotterdam's dynamic citizens?
- 3) How do the relations of green space actors in the Netherlands work within the sustainable global framework of cities?

## DISCUSSION

### **Environmental Policies in the Netherlands and the European Union**

Related to urban green space in Rotterdam is indeed inseparable from the Dutch regional region in the European Union. The Netherlands, which is one of the initiators of the EU establishment, has influenced many strategic policies in the region. One of the most vicious policies on Dutch influence in the EU is the city's environmental and spatial policies, not least the green space policy. Environmental policy is one of the strategic policies that become the main concern for the Netherlands in the effort of achieving sustainable development goals echoed by the European Union. Not only that, but the Dutch attention to environmental policy in the EU is also on the awareness of the geographical condition of its fragile region, but also has a vital role in the European economy.

The attention given by the Dutch to the current environment is not without cause.

Dutch involvement in World War II in 1939 that led to the bombing of the Dutch territory in 1940 also became the trigger. At that time, the city of Rotterdam, which is the centre of the Dutch economy and also the European region became the main target of the German side to be disabled. The bombing devastated Rotterdam, leaving the city devastated. This condition then forced the Dutch to rise immediately. The Dutch's full awareness of its small, densely populated geographical condition and the delta of the Rhine prompted the Dutch to recover from the devastation caused by World War II immediately.

The 1980s became a turning point for the Dutch government in establishing an environmentally sound economic development policy. At that time, the Dutch government was shocked by the death of 14,000 seals in the North Sea. The impact of the demise of tens of thousands of seals also directly threatens human and natural resources that exist in the Netherlands and surrounding areas. The reaction made by Queen Beatrix by stating "the earth is slowly dying" at that time also encouraged the Dutch Government to form a special team in solving this environmental problem.

Under the *Rijksinstituut voor Volksgezondheid en Milieu* (RIVM) or the Dutch Ministry of Health and Environment, a study on environmental development was undertaken. By involving several practitioners and academics, the results of this study resulted in a published report entitled "Concern of Tomorrow". This publication report specially reviews all environmental conditions in the Netherlands. Not only that, but through this publication, also the Dutch government changed its approach in policymaking.

Integration of policies and actions directly focus on them. Besides, multi-stakeholder co-operation, namely the government and the private sector, creates good cooperation in Dutch development. Its policies support the government, and at the same time, the built environment also forms a sustainable economy. What is interesting then is the Dutch set long-term strategy that must be passed by all

components of society. No kidding, the Dutch government set ambitious targets up to 20 years into the future to achieve a better transformation of the environment.

The Dutch commitment to solving environmental problems became the forerunner to the concept of sustainable development (Wallace, 1995). In solving environmental problems, the Dutch government, together with parliament drafted a strategy with a new approach that focuses on the sources of environmental damage. This strategy is known as the National Environmental Policy Plan (NEPP), which is environmental planning to support a sustainable economy. The NEPP strategy issued by the Netherlands provides a new model and knowledge of world environmental policy. Active engagement and multi-sectoral cooperation are an essential part of the NEPP strategy.

This NEPP strategy paid off well because it was different from previous policy approaches. More attention to social issues and scientific review in policy is an integral part of its strength in the Netherlands. This study, therefore, becomes a turning point in the overall improvement of environmental policy in the Netherlands. In implementing this NEPP strategy, the Dutch government used a different approach adapted based on the scale, problem, and ultimate goal to be achieved. There are five levels of the NEPP model applied by the Netherlands, namely (1) local, (2) regional, (3) fluvial, (4) continental, and (5) global. The following is a table of the Dutch NEPP strategy:

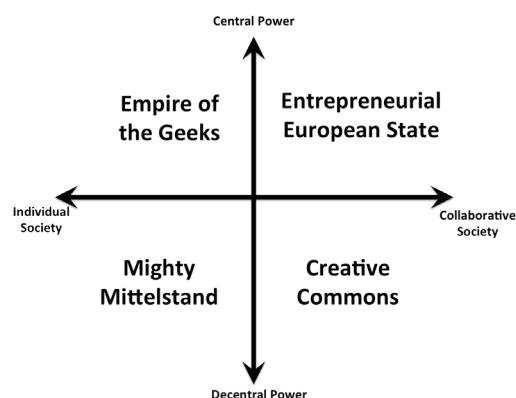
**Table 1. NEPP Model**

SCALE	PROBLEMS	NEPP OBJECTIVE
LOCAL the developed environment	Indoor Environment Soil	Sharp reductions in noise and odour
REGIONAL the landscape	Eutrophication Waste Disposal	Reduce acid emissions and waste by 70-90%
FLUVIAL river basins and coastal seas	Eutrophication Deforestation	Reduce eutrophying and non-degradable substances by 90%

SCALE	PROBLEMS	NEPP OBJECTIVE
CONTINENTAL air and ocean currents	Acidification Fall-out	Reduce acid emissions and some hydrocarbons by 90%
GLOBAL the upper atmosphere	Ozone Layer Depletion Climate Change	Stabilize CO2 emissions at 1989/90 levels by 2000

**Source:** Wallace, 1995

The five levels set by the Dutch in settlement of environmental problems are viewed on a scale of needs. The point is that the environmental damage that occurs at each level has different triggers and impacts. In addition, in its completion, there is a natural cycle process which is also mutually dependent on the source of its original damage. The interesting thing that emerges then the case of environmental policy in the Netherlands is how this country influences EU policy and at the same time also runs the policies set by the EU. the Netherlands government is intensifying its five strategies to tackle its environmental problems, including (1) science and technology, (2) customized implementation, (3) market-based incentives, (4) creation of sustainable choices in the market, and (5) investing in sustainable infrastructure



**Figure 1. Collaboration Scenario for Metropolitan Region Rotterdam Den Haag – Uni Eropa 2030**

**Source:** The Productive City IABR 2016 Atelier Rotterdam, 2016

For the Netherlands, the provincial spatial planning policy strategy bridges between economic benefits and energy transition for

global interests. Indonesia, including countries that use expertise from the Netherlands, mainly concerns their knowledge of water management associated with urban spatial elements in a correct historical record. The environmental cooperation records are documented in the administrative agreements agreed upon by the state, province, municipality and regional water councils. Each province and municipality are also considering sustainability threatened by climate change and the dependence of fossil energy sources as a wave of the third industrial revolution. There are three areas of concern in Dutch policy include:

- a. Environmental protection: through institutions or activities that have the function of preserving the environmental quality of the damage caused by polluting the implications of misuse of natural resources.
- b. Zoning and land-use planning: area protection (human environment) as an implication of human activity with spatial utilization value
- c. Nature Conservation: a wider range of protection including wildlife and even cultural heritage (monuments and landscapes)

Rotterdam, referring to the “Inner Cities as Cultural and Public Arena: Plans and People in Amsterdam and Rotterdam 1992”, since the 1970s reflects “urban revitalization” by realizing Kop van Zuid, the old harbour area that has been abandoned. After a time of struggle between Rotterdam and Dordrecht because of its strategic position on the banks of the Maas river, the land became part of an urban regeneration ambition (De Klerk & Vijgen, 1992). Rotterdam began to improve itself into a post-industrial city by bringing together the interests of the industry with the quality of the urban social environment. The value initiated by this city is not only economic but also emphasizes the importance of creativity with the development as well as the arrangement of social spaces to divert the modern concept of a city.

Rotterdam, like the other Dutch cities, divides the urban ecosystem zone into red, green and blue at several levels of strategic, tactical, operational, and reflexive levels

(Frantzeskaki & Tilie, 2014). The things that underlie the categorization are vision, policy development process, planning, creation of vision, values, identity and culture of the city to support sustainable development.

“red infrastructure (buildings and critical infrastructure), green infrastructure (parks, trees, green walls and roofs, and urban agriculture spaces), and blue infrastructure (the rivers and the waterfront)” (Frantzeskaki & Tilie, 2014: 548)

The term environmental space or eco-space refers from the Dutch language milieugebruiks-ruimte if translated is meant to be an environmental utilization space, first discovered by Dutch researcher Horst Siebert in 1982 which then added the idea of the relationship between the environment with humans by JB Opschoor 1987. The point is that the environment has the ability to recover as long as its pressure is within a certain threshold. Technology becomes the way out to control the carrying capacity of the environment, but social and economic aspects also have a role for environmental space to be maintained (Rydén, Migula, & Andersson, 2003). It reflects that “at any given point in time, there are limits to the amount of environmental pressure that the Earth’s ecosystems can handle without irreversible damage to these systems or to the life support processes that they enable” (Hille, 1997: 7).

### **Urban Green Space Development Towards Sustainable Development in Rotterdam**

Dutch government’s concern about the existence of green space as disaster reduction management centuries ago because of the landscape part of its territory under the sea surface and a number of land reclamation. Rotterdam transformation into one of the greenest cities in the Netherlands since joining the EU is the enforcement of the rules on natural conservation areas (Natuurbeschermingwet 1998). Although much earlier in 1928, the rules on the management of green spaces were applied from different perceptions because it prioritized the aesthetic of natural beauty (Natuurschoonwet). The rule developed from bird protection in 1936 and hunting in 1954 further regulates how

permits for human activities can take place. It was only around 1970 that nature conservation became one of the national policies and in 1995 the emergence of the *Structuurschema Groene Ruimte* document, in particular, the green space became one part of the habitat policy direction in the EU region.

Although the year 2000 became one of the Dutch entry points in the environmental protection network especially the directive habitat, the concept of nature is always integrated with many ministries, such as the Ministry of Agriculture, Natural and Fisheries Management (1989), Ministry of Agriculture, Nature and Food Safety (2003), and Ministry Economic Affairs, Agriculture and Innovation (2010). They experienced a lot of budget cuts for environmental management arrangements that were ultimately adjudged to be included in spatial planning arrangements within the Ministry of Infrastructure and Environment. The result Rotterdam emerged as one of the largest green cities in the Netherlands and has a growing number of green spaces even though its proposed concept leads more to the multi-space that optimizes the urban spaces that have been neglected. In addition to "being a major port and commercial hub, Rotterdam has 117 public parks (1765 ha in total), 500,000 m<sup>2</sup> green roofs and 747,000 trees, making it one of greenest cities in the Netherlands. Green space covers 19.7% of the total city surface, while 34.9% of the city is composed of water" (Gemeente Rotterdam, 2011; Frantzeskaki & Tilie, 2014)

These green spaces are deliberately made by Rotterdam city government to invite people to come back to live in Rotterdam. According to some of our informants, ten years ago this port city was abandoned by its inhabitants who chose to live in other cities so that there were many empty, neglected buildings, town spaces. The awareness to make this city in 2007 again attracts residents or so-called Rotterdammers by considering the green and quality public spaces and areas of economic value.

The vision of Rotterdam as an exemplary city that inspires other delta cities in the world through a sustainable transition by 2030 will

be realized in three significant ambitions. First, being a green, healthy and resilient city. Second, investing in cleaner energy yet low cost and third, build a strong and innovative economy (City of Rotterdam, 2015). The three great destinations of the city known as the world port city have begun to be realized in several initiatives initiated by the city government in cooperation with several other stakeholders, such as private or industry, universities or academics, non-governmental organizations and, of course, Rotterdam citizens themselves. Public-private partnership is key to realizing Rotterdam's sustainable city. In almost every initiative raised in sustainable urban development programs in Rotterdam, 3P has always been called an effective strategy for engaging all parties in an effort to make the city healthier and more robust for people living and working in the city.

One of the priorities in the vision is the green space which is continuously being added quantity, and the quality is continually improved. Based on the interviews that the authors and the research team conducted in the field on April 2017, it was found that municipal governments built some urban park areas with diverse functions, i.e. for water and tree conservation, animal habitats and sports facilities as well as recreation for people living in Rotterdam. The city's urban park is equipped with facilities for pedestrians and cyclists, a play area for children and water sports. In addition, cycling activities as part of the culture of society since 1920 indirectly contributed to the aspect of air pollution reduction so that green space into a meeting of nature and culture.

#### **Nature Culture Engagement in Rotterdam: Creating Public Spaces**

The discussion of the nature of culture engagement lies in the landscape defined as a cultural construction by Hunter (1985) in Swanwick (2009). Initially, the land was defined as a productive resource to support the fulfilment of basic human needs through the provision of food land. The expansion of the concept of land into the land because of its meaning in the agricultural space then became a landscape

in the European history of the relationship between humans with the constructed place in everyday life is not just a particular design implementation. To that end, the definition of European Landscape Convention (ELC) in Swanwick (2009) cited from the Council of Europe landscape is defined in a region where humans and the environment interact and produce a character from a place, as follows:

“an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. The term “landscape” is thus defined as a zone or area as perceived by local people or visitor, whose visual features and character are the result of the action of natural and/or cultural (that is, evolved through time, as a result of being acted upon by natural forces and human beings, it also underlines that landscape forms a whole whose natural and cultural components are taken together not separately.”

According to Swanwick (2009), the environmental value orientation of a society is influenced by several factors including age, social and economic status, ethnic origin, familiarity, nursing and residence, whether urban or rural. He also acknowledged the existence of polarization in a society dependent on perceptions of green space. Nevertheless, the role of experts and professionals to build perceptions of green space is key to intervening people's behaviour to actively shape the “portfolio of places” that many urban studies have become part of the landscape.

Referring to the results of a survey on green space in Rotterdam conducted by Leisure Outlook Questionnaire (2007) and Omnibus Survey (2008) in the following points:

- 1) 7 of 8 Rotterdammers visit the green space in Rotterdam with a frequency of at least once a week reaching 87%.
- 2) The most visited green spaces are parks around their home environment which usually also has a function of the playground with a proportion of visits by 42%
- 3) Kralinge Bos, De Rottemeren, Lage Bergse Bos, the Oude Maas and Zevenhuizer Plas are the most popular for Rotterdammers

- 4) Rotterdammers from non-western ethnic groups visit more frequently in urban parks, squares, playgrounds and playgrounds than those of western ethnicity
- 5) Rotterdammers from western ethnicity more often visit city parks, beaches and other recreational areas.

The embodiment of green space in Rotterdam has ups and downs as in the process also encountered some constraints of housing and infrastructure needs as well as a failure because it does not meet the needs of its citizens. For example 1) Park de Twee Heuvels has a catchment area that is too small for the size of the park, abandoned and dull park layout also gives wrong value to identity factor 2) Spinoza Park is not equipped with transit function for park visitors, 3) Park Zestienhoven whose parking area is too small.

Climate change, post-industrial city transformation and increasing population especially in big cities bring the direction of this research to the discussion of spatial management (zoning system) that negotiate environmental changes with the social needs of its people. Space is not only governed by spatial policy but how city space becomes part of the activities of actors and has an environmental vulnerability in Rotterdam.

In 2008-2009, there was a crisis that became a momentum for Rotterdam and many European cities are considering re-linking the environment with humans that imply the popularity of cultivation activities.

“In 2008 the City of Rotterdam organised the Green Year to focus on the challenges facing urban green infrastructure in terms of budget cuts, substandard landscape quality, and lack of access to and use by certain target groups.”

In the year since the launch of the HIJAU year policy program, urban agriculture has become a new city activity that starts from neglected urban spaces, empty buildings, roofs, school parks and riverside. The initiative comes from landscape designer architects, urban artists or even the surrounding community who

live in the neighbourhood. Although not all goes perfectly, it is recognized by the government that the benefits of the project make space beautify not only the city space but also has a value of productivity.

"Urban agriculture is no an escape from the hectic urban life back to the countryside but, rather, an experience of rural and urban dynamics in a unique symbiosis, an enrichment of the metropolitan landscape."(van der Schans, 2014)

Along with the growing initiative of citizens and communities to participate in the green space, the challenge of land constraints in one of the largest industrial cities in the Netherlands is responded by the city government to use the concept of multi-space and renew the landscape. Therefore, the realization of green space due to land ownership is not a major obstacle, although it takes a long process.

"Areas where urban agriculture takes place on vacant land in public ownership, re-generate another sense of ownership. The city farm brings back community life to this land and, in this sense, draws it back to its natural common-property domain." (van der Schans, 2014)

While the green space project in Rotterdam is not entirely based on urban agriculture, the process of nature-culture engagement is also manifested in the abandoned areas of renewal, the concept of being more socially and economically contributing. One of the green open spaces in South Rotterdam, for example, was originally a forest in the Red Zone District (black area) due to high crime rates. Residents living in the region generally come from lower-middle-class economies, but ultimately through the program of the city government of Rotterdam, a recreational area was built that not only contributed environmentally but also socially and economically. (Interview with Jason, 2017)

The contribution of green space embodied in the form of municipal agriculture and green open space has implications for the quality of human life living in the country with the concept of "welfare state" in which the happiness of its citizens into a benchmark that began popularized globally. Swanwick also noted the

role of green space in the social dimension of the mental and physical aspects of health, social cohesion, and supporting the economy of society. The green space we visited in Rotterdam has its zones based on the type of activities and targeted visitors.

On the other hand, the contribution of the Rotterdam city community in shaping the character of the green space depends on the meaning of the people living around it in planning and exploiting its existence. It is also a heated discussion of Rotterdam city-building ideas at Uit Je Egen Stadts every week of the month.

*"the green spaces in and around towns and cities are enormously varied in nature, but they are used and valued by huge numbers of people who live nearby. They often play an important part in the fabric of everyday lives"* (Swanwick, 2009)

The purpose of the implementation of this kind of activity is as access to the participation of the community that allows collaborating with many actors in several cases, namely filing a judicial review on the environmental impact of a urban development, proposing the innovation of social-economic environment which get significant funding from city government even level European Union. Referring to an interview with Dhanya (interview 2017), that the Dutch government, in this case, including Rotterdam, gave special attention to the system of Network Governance. Network governance refers from Erik-Hans Klijn, and Joop Koppenjan (2007) is one system that is considered to accommodate the needs of cities in the Netherlands because of multi actors with multi motifs, interests and multi perceptions. The relationships that exist between these actors become networks based on previously established rules, beliefs and relationships. The concept of Network Governance requires collaboration and negotiation of actors who pay attention to all opportunities that support the realization of network management.

#### **Urban Green Space Knowledge Network Infrastructure in Global Context Towards Sustainable Cities**

The philosophy of collaboration and partnership in Rotterdam's infrastructure development

is an approach that emphasizes the human factor. Klinkenberg (1999) and Pelling (2003) describe what is called the physical perspective, a view that ignores the human factor as the cause of natural disasters. In Rotterdam's perspective, the physical and nonphysical (human) elements become two inseparable things. Therefore, infrastructure development always involves communities ranging from planning to maintenance. The philosophy that is deployed to other cities is made headline so as to attract other city networks using Rotterdam concept.

The Rotterdam government, which in fact plays a role in the city to city relationship assessing cooperation with private consultants provides many benefits for both cities. Moreover, appointed consultants have much experience in urban planning. They then work with local municipalities to devise strategies appropriate to the characteristics of the city. The adaptation does not necessarily mimic the strategy undertaken in Rotterdam, so support from local partners is needed. There are different perspectives, such as green space applications and land governance. The challenge faced by Jakarta or Ho Chi Minh City is more significant than Rotterdam considering the limited land. In Jakarta and surrounding areas already crowded by housing and business centres. Therefore, it takes innovation that may be applied, such as urban rooftop development or urban garden in the field of sleep. Of course, the entire draft must involve the community as a guardian of the sustainability of green space.

“Our goal is only to help projects that related to climate adaptation in cities incorporated in the C40 Cities. Currently, it also deals with the 100 Cities of Resilience program launched by the Rockefeller Foundation (tujuan kami hanya membantu untuk proyek yang berkaitan dengan adaptasi iklim di kota-kota yang tergabung dalam C40 Cities. Saat ini juga menangani program 100 Resilience Cities yang dicanangkan Rockefeller Foundation)” (Luuk Van der Burgt, personal communication, 3<sup>rd</sup> May 2017).

In addition to helping design programs related to climate change adaptation in other cities, there are other objectives to be achieved by Rotterdam. The involvement of consultants

such as Arcadis, De Urbanisten, Sweco and others aims to expand their business network of consultancies. Especially if the project they run is successful. So, the success can be a best example project that can later be marketed to other cities in the world. The missile project polder system implemented in Ho Cho Minh City is still running until now. If the project succeeds in warding off floods and lowering emissions in accordance with the target, then it will be a kind of free promotion for the consultant. In addition, projects undertaken by Dutch consultants in other cities can also be a valuable lesson for them. “So, it is not just helping but also a good learning and good example for future projects (consultants).” (Luuk Van der Burgt, personal communication, May 3, 2017).

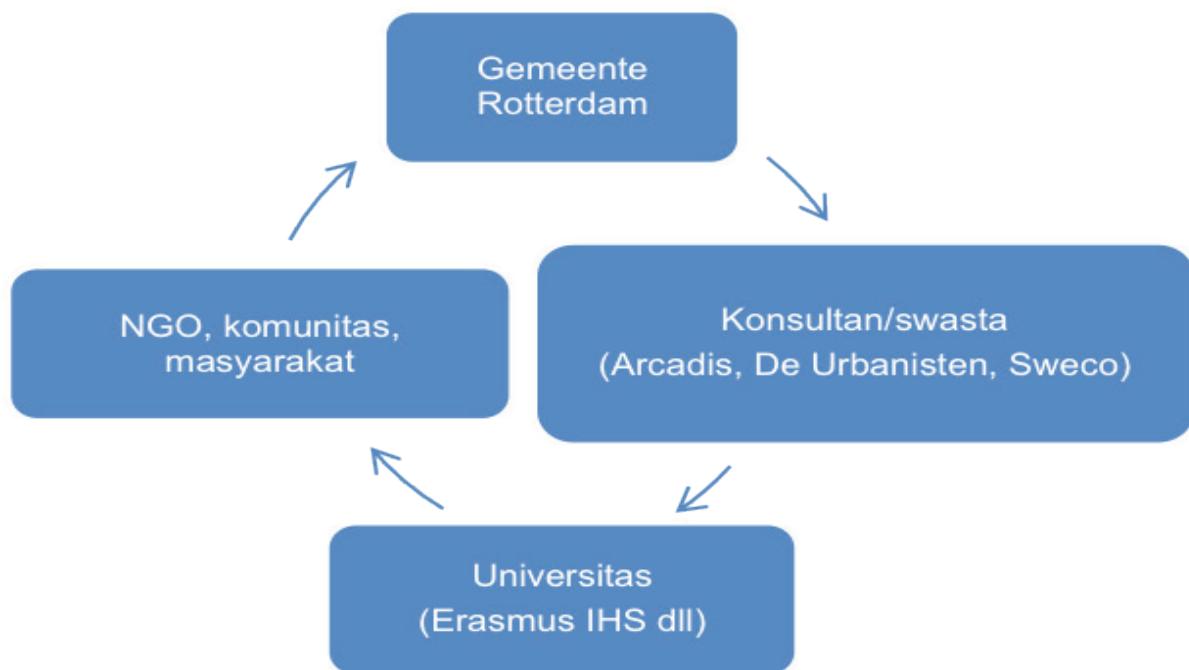
The knowledge network of green space infrastructure in Rotterdam is widespread even in Asian countries. The establishment of C40 Cities and Connecting Delta Cities organizations makes it easier to transfer knowledge and technology. Especially when this organization followed by approximately 90 countries in the world, Rotterdam as a pioneer of green city planning spread the concept of collaboration-based development and partnership. This can be seen from the approach taken from the planning process to continuous care. The process of transfer of knowledge is inseparable from the Dutch consultants such as Arcadis, Sweco, and De Urbanisten. They introduce technology and methods that focus on community participation. Until now, clients handled by Dutch consultants are spread all over the world, including Ho Chi Minh City, Jakarta, and Singapore.

In Indonesia, the influence of Rotterdam in urban spatial planning is considerable. In addition to sister city relations, there is an Indonesian diaspora organization focused on sustainable urban procurement. The organization is TF Liveable Cities, established since 2012. The platform is comprised of professionals such as architects, urban planners, students, engineers who are currently studying or working in the Netherlands. The community has resulted in several projects and plans that are beneficial for the sustainability of urban

dwellers in Indonesia. Nevertheless, TF Liveable Cities has not entered the policy sphere, so some proposals still have to be suspended due to unauthorized permission and so on.

The knowledge network propagated by Rotterdam to other cities means a new approach that does not necessarily concern the physical element. It is one good example is the develop-

ment of green infrastructure later. However, differences in the characteristics of the people between Rotterdam and other cities become worthy of consideration. For example, in terms of Language or communication methods used in the construction of green spaces.



**Figure 2.** Actor-Network Scheme in Rotterdam Urban Green Spaces

Source: Field Research, 2017

## CONCLUSION

One of the indicators of sustainable city creation is the availability of open green spaces (Gómez et al., 2011; Nijkamp & Parrells 1994). The availability of green space has a positive impact on environmental aspects. Especially in efforts to decrease air pollution and efforts to increase water catchment areas in urban areas. In addition, green space can be articulated into a valuable public space as a means of social activity of the city or as an assembly point.

Rotterdam has ordained itself as the city of laboratory or experimental city (Peters, 2016). The city is host to dozens of ecosystem-based experimental projects. In contrast to Dublin and

London, Rotterdam has focused on developing the RTH post-flood disaster in 1953 that killed about 1,800 lives (d'Angremond, 2003). Initially, Rotterdam has a particular concern on the application of green open space as part of its water management technology. Rotterdam realizes the importance of green space ecologically to ward off floods and heatwaves. However, during its development, the RTH function in Rotterdam was expanded into a recreational facility and became a meeting point among the diverse Rotterdam communities. It is shown by the participation of all circles in the development of public space and green space. In fact, the initiation of RTH development involves the general public.

The city government of Rotterdam uses the Urban ecosystem governance in the City of Rotterdam approach, but community elements with an architect, environmental, agricultural background as well as education, health and art are also part of policymaking. Therefore, the relationship created between the state and society is no longer a one-way but multi-direction in the form of a local idea network which then relates to the global context.

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## Interview

Luuk Van der Burgt, Gemeente Rotterdam, 3rd May 2017