ARC UI
Asia Research Centre
Universitas Indonesia

POLICY PAPER

MAINSTREAMING CLIMATE-RESILIENT, LOW CARBON DEVELOPMENT PLANS: THE CASE OF THE NORTH OF JAKARTA SPECIAL CAPITAL REGION

Executive Summary

The policy paper has been prepared in response to the ratification of the Jakarta Governor Regulation No. 90 of 2021 (Pergub 90/2021) concerning Climate-Resilient Low-Carbon Regional Development Plans (RPRKD). Through a desk review, field observations, and interviews, this policy paper analyzes the potential and limitations of plans to strengthen climate-resilient basic services in the coastal areas of North Jakarta. The focus of the analysis is on five main areas, i.e. education; health; spatial planning; peace, public order, and community protection; as well as social economics. Another focus is on the poor living in slum areas as the most vulnerable group facing the various impacts of climate change.

The points of analysis presented in this policy paper are as follows:

- In the education sector, efforts to utilize educational institutions in climate change adaptation in coastal areas can be challenged by the high dropout rate in North Jakarta City and the lack of institutionalization of low-emission governance principles in the management of educational institutions.
- In the health sector, efforts to reduce the number of diseases caused by climate change must be supported by adequate data on the prevalence of the diseases as well as community-based strategies to maintain health and prevent or treat the diseases.
- In spatialplanning, thereareproblems inthe integration between Pergub 90/2021 and other spatial planning policies, especially regarding reclamation. In addition, there are no implementing regulations that can ensure the application of climate change mitigation and adaptation principles in regional development.
- Efforts to maximize peace, public order, and community protection must be

supported by adequate data on the impact of infrastructure and demographic of climate change response policies on communities on the coast of North Jakarta. Infrastructure adaptation takes the form of massive-scale development (through GSW construction together with the reclamation and superblock constructions), while demographic adaptation takes the form of relocating residents from their homes to adaptation support infrastructure adaptation.

- Adequate data is also needed to understand changes in occupational and residential patterns that occur as a result of infrastructure and demographic adaptations to support efforts in improving the social and economic conditions of coastal residents in North Jakarta.

Based on the points of analysis above, this policy paper recommends to the Government of North Jakarta City and the Provincial Government of the Jakarta Special Capital Region to:

- Prioritize efforts to reduce dropout rates, together with efforts to develop a low-carbon emission school assessment instrument;
- Strengthen data collection related to the prevalence of climate change-related diseases and identify community-based efforts to maintain health, prevent and treat climate-based diseases;
- Integrate climate change and spatial planning policies and establish more binding implementing regulations;
- Carry out social mapping regarding the short-, medium-, and long-term impacts of infrastructure and demographic adaptations to human security;
- Map the patterns of changes in occupation and place of residence that occur as a result of these infrastructure and demographic adaptations.

Policy Paper
Mainstreaming Climate-Resilient, Low Carbon Development
The Case of the North Coast of Jakarta Special Capital Region

Authors:

Suraya Abdulwahab Afiff
Inaya Rakhmani
Diatyka Widya Permata Yasih
Bayu Asih Yulianto
Jauharah Fitriah
Setyo Manggala Utama

Published in Indonesia on 2023 by Asia Research Centre,
University of Indonesia

Cendekia Multiguna Jakob Oetama Room, H Building, Faculty of Social and Political Science,
University of Indonesia, Depok, West Jawa 16424, Indonesia
arc.ui.ac.id

Photo cover and design by Setyo Manggala Utama
Translated by Dini Andarnuswari

Foreword

This policy paper, "Mainstreaming Climate-Resilient, Low-Carbon Development Plans: The Case of the North Coast of Jakarta Special Capital Region", is prepared by interdisciplinary scholars from the Asia Research Center, University of Indonesia. It aims to provide an academic response to the ratification of the Governor Regulation of Special Capital Region of Jakarta No. 90 of 2021 (Pergub 90/2021) concerning Climate-Resilient, Low-Carbon Regional Development Plans (RPRKD). In this paper, we analyze the potential and obstacles to implementing a plan to strengthen climate-resilient basic services in the coastal areas of North Jakarta.

Drawing on desk review, key interviews, and stakeholder engagement, we compiled several review-based recommendations for the Government of North Jakarta City. We identified gaps between the RPRKD, which prioritized five main areas—education; health; spatial planning; peace, public order, and community protection; and social economics—and the conditions of the poor living in the slum areas of the north coast of Jakarta. To ensure that the RPRKD runs effectively, we suggest the Government of North Jakarta City develop an implementation plan based on studies of the groups most vulnerable and most affected by climate change.

The study underlying this policy paper is supported by the Joint Funding Scheme: Southeast Asia and Europe, a research program and a multi-year collaboration between the Dutch Research Council (NWO) and the Ministry of Education, Culture, Research, and Technology. We also thank our collaborators at the Institute of Social Studies (ISS), The Hague, Netherlands, for their cooperation; and also the field workers, editors, translators, and financial administration assistants who have supported the process of producing this policy paper. In solidarity.

Happy reading.

Authors

Table of Contents

Introduction

Indonesia is one of the countries most vulnerable to climate change (Triana & Janottama, 2021). Various studies have revealed how Indonesia is exposed to various hydrometeorological disasters, including sea level rise, coastal erosion, and land subsidence (Triana, 2020; Takagi et al., 2016; Ward et al., 2010). The impact of hydrometeorological disasters is exacerbated by population density and high economic and social inequality in the country (Putra et al., 2019; Surtiari et al., 2017; Yoo et al., 2014).

Jakarta is identified as one of the most vulnerable coastal cities to climate change in Southeast Asia (Yusuf and Francisco, 2009). Its position in the delta region and the Pacific Ring of Fire contributes to this vulnerability. The irregular use of space in Jakarta exacerbates the vulnerability of its population to climate change (Pemprov DKI Jakarta, 2019).

The most frequent natural disaster in Jakarta is flooding. North Jakarta and Seribu Islands (the Thousand Islands), more specifically, are facing the problem of rising sea levels at the most worrying level (Firman et al., 2011). Among those most vulnerable to the effects of climate change are the poor, who live in slums in various areas of Jakarta (Firman et al., 2011). Those who are also categorized as vulnerable are vulnerable and disabled age groups (Pemprov DKI Jakarta & Secretariat of Jakarta Defense, 2019).

In 2021, the Jakarta Government passed the Regulation of the Governor of the Special Capital Region of Jakarta No. 90 (Pergub 90/2021) concerning Climate-Resilient Low-Carbon Regional Development Plans (RPRKD). This policy paper has been designed in response to the issuance of this policy with the aim of:

- Mapping the climate change action plan, as stipulated in Pergub 90/2021, especially in the context of coastal area management;
- Identifying the potential and limitations of the implementation of the various plans, by referring to the findings from previous studies regarding the living conditions of coastal communities in North Jakarta;
- Preparing recommendations for the implementation plan of Pergub 90/2021.

Policy Background

In 2016, the Ministry of Environment and Forestry (KLHK) of the Republic of Indonesia issued the Minister of Environment and Forestry Regulation concerning Guidelines for the Preparation of Climate Change Adaptation Actions P.33/Menlhk/Setjen/Kum.1/2/2016, which demonstrates the Indonesian government's commitment to the ratification of the Paris Agreement on United Nations Framework Convention on Climate Change. In 2021, the President of the Republic of Indonesia issued Presidential Regulation No. 98 of 2021 concerning the Implementation of Carbon Values to Achieve Nationally Determined Contribution Targets and Control of Greenhouse Gas Emissions in the National Development. The Jakarta Special Capital Region is the first province to implement this regulation through Pergub 90/2021 (iNews.id, 2021).

The Pergub, which outlines the Low-Carbon Development Plan (RPRKD), targets Jakarta to become a climate-resilient city by 2030 (Kumparan, 2021). Referring to the Paris Agreement, the target for greenhouse gas emissions reduction is 50 per cent by 2050. The purpose of this action plan-based regulation is to overcome the problem of greenhouse gas emissions that comes from the energy, waste,

industrial processes, and product use (IPPU) sectors, as well as agriculture, forestry, and other land use (AFOLU). This regulation was made so that the Government of the Jakarta Special Capital Region has a legal basis for coordinating climate change mitigation actions by various stakeholders from the business sector, international cooperation, State/ Regional Owned Enterprises, and the private sector (Pergub 90/2021, Article 5).

One of the aspects within the scope of the RPRKD is "management of coastal areas and small islands, which aims to protect coasts and small islands from events related to the Impact of Climate Change" (Pergub 90/2021, Article 8, paragraph 1, item c).

Policy Statement

This series of policy briefs seeks to provide evidence to strengthen the implementation of Pergub 90/2021 in five basic service areas for climate-resilient development. The five areas include education; health; spatial planning; peace, public order, and community protection; as well as social economics that focus on employment. The evidence presented here comes from the policies and programs of the related parties, secondary data, and publicly available prior research reports, which are used as a basis for identifying various challenges faced by the poor and vulnerable groups in the northern coastal areas of the Jakarta Special Capital Region. The research team used:

- Desk review of the policies and programs of the parties related to the management of the coastal areas and the north coast of the Jakarta Special Capital Region, which is the implementation of the RPRKD, and secondary data and the results of prior research which can provide an overview of the conditions of the northern coastal communities of Jakarta;
- Observation of the conditions of the northern coastal communities of Jakarta;
- Interviews with key actors from local government and civil society circles.

Discussion

This section will discuss the potential and limitations of plans to strengthen climate-resilient basic services as stipulated in Pergub 90/2021. Aspects to be discussed include education; health; public works and spatial planning; peace, public order, and community protection; and social economics.

A.Education

Pergub 90/2021 pays attention to the important role of educational institutions in the climate change agenda. This policy recognizes the role of educational institutions in campaigning for an environmentally friendly lifestyle in small social scopes, such as the school environment and circles of friends (Annex to Pergub 90/2021, page 34). This policy also provides an opportunity for Jakarta residents to continue their education in order to participate in advocacy efforts for low-carbon development (Annex to Pergub 90/2021, page 34). The recognition of the role of educational institutions in Pergub 90/2021 refers to UNESCO's suggestion to place educational institutions as agents of social transformation in the context of climate change adaptation (Unesco.org, 2022).

However, North Jakarta's Human Development Index (IPM) from 2018 to 2020 is low compared to other cities in the Jakarta Special Capital Region or the Jakarta Province. The HDI for North Jakarta City is only higher than the Seribu Islands Regency and lower than the average

HDI for the Jakarta Province (BPS Kota Jakarta Utara, 2022a). The school enrollment rate for residents aged 16-18 years in North Jakarta City remains below the average of the Jakarta Province (BPS Kota Jakarta Utara, 2022b). In 2017, Jakarta Governor Anies Baswedan stated that 42% of school-age children in North Jakarta dropped out of school or were unable to complete their education up to the high school level (Tribunnews, 2017). The data shows that access to education still becomes grave homework for the Government of North Jakarta City. Therefore, the intention to place educational institutions as supporters of climate change adaptation must also be accompanied by efforts to increase school participation.

The next problem is related to the limited role given to educational institutions in climate change adaptation efforts. In this context, Pergub 90/2021 stipulates that the main role of an educational institution in climate change adaptation is to campaign for the climate change agenda and increase the capacity of human resources in continuing climate change education. This Pergub has not regulated the institutionalization process of low-emission governance principles in the management of educational institutions in Jakarta. Furthermore, this Pergub has not referred to the standardization of educational infrastructure that meets low-emission criteria. Aspects to be regulated include the low-carbon emitting architecture of school buildings, environmentally friendly school building materials, school governance that allows for energy savings and low emissions, and an educational curriculum to raise awareness and adaptive attitudes towards climate change.

B. Health

In the health sector, Pergub 90/2021 stipulates that adaptation to climate change is carried out through efforts to reduce the number of diseases affected by the weather (Pergub 90/2021, Article 8). These are reflected in the climate change adaptation action plans in the health sector, which include (Annex to Pergub 90/2021, pages 25-26):

1. Provision and improvement of health service facilities;
2. Management of health services;
3. Implementation of health program socialization to communities;
4. Domestic wastewater management.

The action plans above have a chance to drive improvements in the quality of health among the most vulnerable groups. It is provided, among other things, by the detailed action focus on the management of regional health insurance (Annex to Pergub 90/2021, page 25). The detailed action can be an effort to increase participation in the Jakarta Health Card as a program designed to open as widest access possible to health services, especially for the poor.

The detailed action also focuses on two vulnerable groups: 1) Socially Assisted Residents (Warga Binaan Sosial, WBS), which consist of neglected children, abandoned persons with disabilities, neglected elderly, and homeless and beggars (Annex to Pergub 90/2021, pages 25-26); and 2) those who have disabilities (Annex to Pergub 90/2021, page 24).

However, action plans in the health sector do not specifically mention diseases caused by floodings, such as diarrhoea and flu (including fatal and acute kinds) and skin infections (Caljouw et al., 2009). The action plan actually mentions several other diseases,

such as diabetes mellitus, integrated non-communicable diseases, intestinal worms, pneumonia, measles, malaria, DHF, and hepatitis B (Appendix to Pergub 90/2021, page 25).

Attention to the diseases above is of course important. However, this policy paper recognizes the need to focus on the diseases directly linked to climate change. The prevalence of diarrhoeal disease, for example, is positively worrying in the slum areas of North Jakarta, where the supply of clean water and sanitation for most communities is far from adequate (Simanjuntak et al., 2004). Impermanent house structures which are often flooded are one of the factors that cause diarrhoea. Susceptibility to diarrhoeal diseases is higher among the poorest groups.

In addition, in Jakarta, limited sources of clean water induce many occurrences of gastroenteritis, DHF, and tuberculosis (Jakarta Provincial Government & Jakarta Defense Secretariat, 2019). Most of the raw water sources in Jakarta are also heavily polluted.

Nonetheless, this policy paper sees that the inclusion of domestic wastewater management as one of the actions in the health sector (Annex to Pergub 90/2021, page 26) has the potential to reduce the number of weather-affected diseases, especially diarrhoea. This is considering that improvements in clean water supply, sanitation, and housing structures can play a role in reducing the prevalence of diarrhoeal diseases.

C. Spatial Planning

The issue of climate change is closely related to spatial planning. Massive spatial changes have contributed to a decrease in ecological resilience in the northern coastal areas of Jakarta. Based on Landsat data images from 1998, 2008 and 2018, Rizal and Haikal's (2021) study shows that there have been extensive spatial changes in the coastal areas of Jakarta. Buildings and open lands in this area have contributed to the degradation of mangrove ecosystems and other marine ecosystems.

There is relatively little discussion of spatial planning in Pergub 90/2021, although the meaning emphasized is fairly significant. The mention of spatial planning is in Article 13, paragraph 1, letter a, where it is stated that the RPRKD must be integrated with regional spatial layout plans, regional long-term development plans, regional medium-term development plans, and regional government work plans. This mention implies that the existing regional development planning rules are an important reference for climate change mitigation and adaptation efforts in the Special Capital Region of Jakarta. The question then is how far the RPRKD integration has been carried out, at least through the regulations of spatial planning in the Jakarta Province area.

Rules regarding spatial planning in the Special Capital Region of Jakarta have been set forth in the Regional Regulation No. 1 of 2012 (Perda 1/2012) concerning the 2030 Regional Spatial Plan. The Perda stipulates that climate change adaptation actions must be included in the spatial planning framework. Based on this rule, the Jakarta government is required to make efforts to reduce greenhouse gas emissions (Article 6, paragraph 5, point c). Climate change adaptation actions are also carried out to reduce disaster risks that may arise (Article 6, paragraph 8, point c). Furthermore, Article 14, paragraph 3, point c asserts that the north coast

of Jakarta must be developed in anticipation of climate change to reduce disaster risks. This development strategy seems to be directed through efforts to revitalize and reclaim the north coast of Jakarta (Article 8, paragraph 3, letter b).

However, reclamation is not mentioned in Pergub 90/2021 at all. This Pergub does not prohibit reclamation but also does not provide an imperative for the continuation of reclamation. In other words, there is no common vision in the climate change adaptation policies in the coastal areas of Jakarta since Perda 1/2012 and Pergub 90/2021 are not integrated with each other.

The unintegrated regulations above allow for different interpretations at the level of policy implementers, especially when it comes to the development of the Jakarta coastal areas in anticipation of climate change. Such interpretations may allow various parties to build arguments that what has been done is in accordance with applicable regulations, although in practice it may have the potential to increase the negative impacts of climate change, increase disaster risks, and weaken the social resilience of the poorest and most vulnerable groups of people who live in coastal areas.

D.Peace, Public Order, and Community Protection

Questions of peace, public order, andcommunity protection in the context of climate change are often summarized as issues of human security (UNTFHS, 2022). This issue, in the context of this policy paper, emerges as the impact of infrastructure and demographic adaptation of policies regarding climate change responses on communities on the northern coast of Jakarta. Infrastructure adaptation takes the form of massive-scale development (through the construction of the Giant Sea Wall or GSW, together with the reclamation and superblock constructions), while demographic adaptation takes the form of relocating residents from their homes to support infrastructure adaptation.

For example, GSW construction and reclamation projects require the relocation of the homes of the poor who depend on their livelihoods as fishermen or small-scale farmers (Padawangi, 2012). In this context, massive relocation of people's homes occurred in coastal areas. LBH data shows that the North Jakarta City Government carried out eviction efforts at twelve points in 2018 (LBH Jakarta, 2018: 20). Along with it, the Government developed superblock areas extensively by providing housing facilities, shopping centres, education, health, and entertainment (Salim et al., 2019). This infrastructure and demographic adaptation narrow the spaces that can be used by the poor and vulnerable groups to make a living and to live, thus raising the issue of human security.

In Pergub 90/2021, the security and public order sectors are not specifically mentioned because they are classified into other sectors outside the seven ones for climate change adaptation activities implementation (Article 8, paragraph 1). If these other sectors are to be developed, it is stated in Article 8, paragraph 2, that it will be adjusted to the development needs of the Special Capital Region of Jakarta and is regulated through a Governor's Decree.

In 2019, there were 1,975 incidents of security disturbances in North Jakarta in the form of theft, fraud, murder, assault, hold-up, embezzlement, forgery, use of sharp weapons, motor vehicle theft, and other forms of crime

(BPS Kota Jakarta Utara, 2022c). This figure is actually lower than the crime rate in other cities in the Jakarta Province area (BPS DKI Jakarta Province, 2022). Nonetheless, infrastructure and demographic adaptations have brought about various changes that potentially disrupt the human security of coastal communities. Burnett, Wada, Endo, Taniguchi (2016), for example, assert that the negative impacts of the GSW development include ecological damage, loss of exotic sceneries, and non-material losses that are incalculable. Despite potentially inducing broader security and public order issues, such negative impacts of infrastructure and demographic adaptation for North Jakarta's coastal communities have not been adequately mapped.

E.Social Economics

In Article 1, point 11, Pergub 90/2021 stipulates that "Climate-Resilient Low-Carbon Development is a development system that maintains economic growth, reduces poverty, and helps achieve development targets in various sectors, while at the same time helps achieve the goals of tackling Climate Change, sustainability of the environment and natural resources." From the wording of the article, it is clearly implied that one of the indicators of climate resilience is the capacity of employment opportunities to provide jobs for community members. This is emphasized in the Appendix to Pergub 90/2021 (page 10) which stipulates that development endeavours must be focused on equal distribution of population, economic equality, and employment.

Although the availability of employment is recognised as important for measuring community vulnerability to climate change risks, in this regard Pergub 90/2021 has not specifically stated an action plan. Meanwhile, the percentage of open unemployment is somewhat significant in North Jakarta, reaching 11.79% in 2020 and 9.84% in 2021 (BPS, n.d.). It is higher than the Special Capital Region of Jakarta's open unemployment rate, which reaches 10.95% in 2020 and 8.50% in 2021 (BPS, n.d.). In 2022, 36.88% of the Special Capital Region of Jakarta's population is absorbed in the informal sector (BPS, 2022). Included in this category of informal workers are fishermen or small-scale farmers, who are most affected by the massive-scale development process in coastal areas. Although quite a large number of Jakarta residents are absorbed in the formal sector, which is 63.12%, in 2022 working conditions in this sector will be increasingly vulnerable (Yasih 2022), so it is highly likely that workers in this sector will switch to the informal sector.

The infrastructure and demographic adaptations described in the previous section can have a variety of impacts, both on those working in the informal sector and formal sector workers whose working conditions are precarious. In Kalibaru District, North Jakarta, for example, GSW is indicated to have a positive impact because it can reduce the intensity of tidal floods that flow into people's settlements (observation note, November 2022). If true, then it does reduce the negative impact of tidal floods. However, GSW hinders the access of most fishermen to the sea, requiring them more effort to load and unload the fish they catch (observation note, November 2022). Even some traditional shipyards died because direct access to the sea is closed by the walls.

So far, the available data has not been sufficient to show the impacts of infrastructure and demographic adaptations on changes in the livelihood and residential patterns of the northern coastal residents of Jakarta, especially the poor and marginal groups. Such changes, both positive and negative, including those

that pose a threat to human security, must be comprehensively identified.

Recommendation

Based on the analysis of the potential and limitations of plans to strengthen climate-resilient basic services as stipulated in Pergub 90/2021, this policy paper provides several recommendations in education; health; peace, public order, and community protection; spatial planning; as well as social economics.

In education, this policy paper recommends that the Government of North Jakarta City prioritize efforts to reduce dropout rates. The said Government also must develop a low-carbon emission school assessment instrument. This instrument is not only oriented towards raising awareness in dealing with the impacts of climate change on the coast but can also be used to develop education governance adaptive to climate change at the school level.

In health, this policy paper recommends that the Government of North Jakarta City strengthen data collection on the prevalence of diseases caused by climate change, especially among the poorest and most vulnerable groups. In addition, the said Government also must identify community-based disease prevention and treatment efforts carried out by community groups. The Government needs to support such community-based initiatives and adapt them to the existing health standards.

In spatial planning, this policy paper recommends an integration between Pergub 90/2021 and Perda 1/2012. At the simplest level, integration can be carried out at the level of policy implementation. The Jakarta Provincial Government must compile implementing regulations to make the development programs for the North Jakarta coastal areas, referring to the Jakarta Regional Spatial Plan, have Pergub 90/2021 as the main consideration. By referring to Pergub 90/2021 in development programs in the Special Capital Region of Jakarta, climate change mitigation and adaptation efforts can run in parallel and be institutionalized effectively.

In the areas of peace, public order, and community protection, this policy paper recommends that the Government of North Jakarta City carry out a social mapping of the short-, medium-, and long-term impacts of adaptations of infrastructure (in the form of GSW construction, together with the reclamation and superblock constructions) and demography (in the form of relocation). In this social mapping, it is also necessary to identify what steps to take in the short, medium, and long terms to reduce risks to human security threats to residents in coastal Jakarta.

In social economics, this policy paper recommends that the Government of North Jakarta City map patterns of changes in occupation and residence that occur as a result of infrastructure and demographic adaptations. It is also necessary to identify the adaptations made by the people in responding to changes in their occupational patterns and where they live, in order to maximize support for residents.

References

BPS. (n.d.). Tingkat Pengangguran Terbuka (TPT) Provinsi DKI Jakarta Menurut Kabupaten/Kota (Persen), 2019-2021. Diakses 20 Desember 2022, pada: https://jakarta.bps.go.id/indicator/154/84/1/tingkat-pengangguran-terbuka-tpt-provinsi-dki-jakarta-menurut-kabupaten-kota.html

BPS. (2022). Sektor Formal Makin Mendominasi Penyerapan Tenaga Kerja di Jakarta. Diakses 20 Desember 2022, pada: https://jakarta.bps.go.id/pressrelease/2022/11/07/991/sektor-formal-makin-mendominasi-penyerapan-tenaga-kerja-di-jakarta.html

BPS Kota Jakarta Utara. (2022b). Angka Partisipasi Sekolah Menurut Kelompok Umur dan Jenis Kelamin 2019. Diakses

pada: https://jakutkota.bps.go.id/indicator/28/285/1/angka-partisipasi-sekolah-menurut-kelompok-umur-dan-jenis-kelamin.html

BPS Kota Jakarta Utara. (2022c). Data Kriminalitas Jakarta Utara Menurut Bulan 2019. Diakses pada: https://jakutkota.bps.go.id/indicator/27/333/1/data-kriminalitas-jakarta-utara-menurut-bulan.html

BPS Provinsi DKI Jakarta. (2022). Jumlah Kejahatan/Pelanggaran Kamtibmas Menurut Jenis dan Kab/Kota Administrasi 2017-2020. pada: https://jakarta.bps.go.id/indicator/27/580/1/jumlah-kejahatan-pelanggaran-kamtibnas-menurut-jenis-dan-kabupaten-kota-administrasi-2018.html

Burnett, K., Wada, C., Endo, A., & Taniguchi, M. (2016). Cost-Benefit Analysis of Disaster Mitigation Infrastructure: The Case of Sea Walls in Otsuchi, Japan. Working Papers 2016-5, University of Hawaii Economic Research Organization, University of Hawaii at Manoa.

Caljouw, M., Nas, P. J., & Pratiwo, M. R. (2009). Flooding in Jakarta: Towards a Blue City with Improved Water Management. Bijdragen tot de taal-, Land-en Volkenkunde/Journal of the Humanities and Social Sciences of Southeast Asia, 161(4), 454-484.

Firman, T., Surbakti, I. M., Idroes, I. C., & Simarmata, H. A. (2011). Potential Climate-Change Related Vulnerabilities in Jakarta: Challenges and Current Status. Habitat International, 35(2), 372-378.

iNews.id. (2021). Terbitkan Pergub No. 90 Tahun 2021, Anies Targetkan Jakarta Kota Berketahanan Iklim. Diakses pada: https://www.inews.id/news/megapolitan/terbitkan-pergub-nomor-90-tahun-2021-anies-targetkan-jakarta-jadi-kota-berketahanan-iklim

Kumparan.com. (2021). Pemprov DKI Jakarta Kejar Target Penurunan Emisi Gas Rumah Kaca Sebesar 50% Tahun 2030. Diakses pada: https://kumparan.com/kumparannews/pemprov-dki-kejar-target-penurunan-emisi-gas-rumah-kaca-sebesar-50-tahun-2030-1zAYrysiGtB

BPS Provinsi DKI Jakarta. (2022). Jumlah Kejahatan/Pelanggaran Kamtibmas Menurut Jenis dan Kab/Kota Administrasi 2017-2020. pada: https://jakarta.bps.go.id/indicator/27/580/1/jumlah-kejahatan-pelanggaran-kamtibnas-menurut-jenis-dan-kabupaten-kota-administrasi-2018.html

Burnett, K., Wada, C., Endo, A., & Taniguchi, M. (2016). Cost-Benefit Analysis of Disaster Mitigation Infrastructure: The Case of Sea Walls in Otsuchi, Japan. Working Papers 2016-5, University of Hawaii Economic Research Organization, University of Hawaii at Manoa.

Caljouw, M., Nas, P. J., & Pratiwo, M. R. (2009). Flooding in Jakarta: Towards a Blue City with Improved Water Management. Bijdragen tot de taal-, Land-en Volkenkunde/Journal of the Humanities and Social Sciences of Southeast Asia, 161(4), 454-484.

Firman, T., Surbakti, I. M., Idroes, I. C., & Simarmata, H. A. (2011). Potential Climate-Change Related Vulnerabilities in Jakarta: Challenges and Current Status. Habitat International, 35(2), 372-378.

iNews.id. (2021). Terbitkan Pergub No. 90 Tahun 2021, Anies Targetkan Jakarta Kota Berketahanan Iklim. Diakses pada: https://www.inews.id/news/megapolitan/terbitkan-pergub-nomor-90-tahun-2021-anies-targetkan-jakarta-jadi-kota-berketahanan-iklim

Kumparan.com. (2021). Pemprov DKI Jakarta Kejar Target Penurunan Emisi Gas Rumah Kaca Sebesar 50% Tahun 2030. Diakses pada: https://kumparan.com/kumparannews/pemprov-dki-kejar-target-penurunan-emisi-gas-rumah-kaca-sebesar-50-tahun-2030-1zAYrysiGtB

LBH Jakarta. (2018). Laporan Penggusuran Paksa di Wilayah DKI Jakarta Januari-September 2018: Masih Ada. Jakarta: LBH Jakarta.

Padawangi, R. (2012). Climate Change and the North Coast of Jakarta: Environmental Justice and the Social Construction of Space in Urban Poor Communities. Dalam W. Holt (Ed.), Urban Areas and Global Change (pp. 321–339). Bingley: Emerald.

Pemprov DKI Jakarta & Sekretariat Jakarta Berketahanan. (2019). Strategi Ketahanan Kota Jakarta. Jakarta: Pemprov DKI Jakarta & 100 Resilient City. Diakses pada: https://resilientcitiesnetwork.org/downloadable_resources/Network/Jakarta-Resilience-Strategy-Indonesian.pdf

Peraturan Daerah DKI Jakarta No. 1 Tahun 2012, Rencana Tata Ruang Wilayah 2030. 12 Januari 2012. Lembaran Daerah Provinsi Daerah Khusus Ibukota Jakarta Tahun 2012 Nomor 1. Jakarta.

Peraturan Gubernur Daerah Khusus Ibukota Jakarta No. 90 Tahun 2021, Rencana Pembangunan Rendah Karbon Daerah yang Berketahanan Iklim. 8 Oktober 2021. Berita Daerah Provinsi Daerah Khusus Ibukota Jakarta Tahun 2021 Nomor 53012. Jakarta.

Putra, G. A. Y., Koestoer, R. H., & Lestari, I. (2019, Februari). Local Resilience towards Overcoming Floods of Local Climate Change for Adaptation: A Study of Marunda Community in North Jakarta. IOP Conference Series: Earth and Environmental Science, 239(1), 012043.

Rizal, A. & Haykal, F. (2021). Land Use Change Analysis in Jakarta Bay Coastal Area Between 1998, 2008, and 2018. Jurnal Segara, 17(2), 135-144.

Salim, W., Bettinger, K., & Fisher, M. (2019). Maladaptation on the Waterfront: Jakarta's Growth Coalition and the Great Garuda. Environment and Urbanization Asia, 10(1), 63-80.

Simanjuntak, C. H., Punjabi, N. H., Wangsasaputra, F., Nurdin, D., Pulungsih, S. P., Rofiq, A., ... & Clemens, J. D. (2004). Diarrhoea Episodes and Treatment-Seeking Behaviour in a Slum Area of North Jakarta, Indonesia. Journal of Health, Population and Nutrition, 119-129.

Surtiari, G. A. K., Djalante, R., Setiadi, N. J., & Garschagen, M. (2017). Culture and Community Resilience to Flooding: Case Study of the Urban Coastal Community in Jakarta. Dalam R. Djalante, M. Garschagen, F. Thomalla, R. Shaw (Ed.), Disaster Risk Reduction in Indonesia (pp. 469-493). Springer Cham.

Takagi, H., Esteban, M., Mikami, T., & Fujii, D. (2016). Projection of Coastal Floods in 2050 Jakarta. Urban Climate, 17, 135-145.

Triana, K. (2020). Sea Level Rise in Indonesia: The Drivers and the Combined Impacts from Land Subsidence. ASEAN Journal on Science and Technology for Development, 37(3), 115-121.

Triana, K. & Janottama, S. Z. (2021, December). The Projection of Sea Level Rise in Southeast Asia's Coastal Cities Using Satellite Alimetry Data (1992-2020). Proceedings of National Colloquium Research and Community Service, 5, 14-18.

Tribunnews.com. (2017). Anies Sebut 48 Persen Anak di Jakarta Utara Putus Sekolah. Diakses pada: https://www.tribunnews.com/metropolitan/2017/03/19/anies-sebut-48-persen-anak-di-jakarta-utara-putus-sekolah

Unesco.org. (2022). Climate Change Education. https://www.unesco.org/en/education/sustainable-development/climate-change

UNTFHS. (2022). Climate Change: Applying Human Security to Climate Change. Diakses pada: https://www.un.org/humansecurity/climate-change/

Ward, P. J., Marfai, M. A., Yulianto, F., Hizbaron, D. R., & Aerts, J. C. J. H. (2011). Coastal Inundation and Damage Exposure Estimation: A Case Study for Jakarta. Natural Hazards, 56(3), 899-916.

Yoo, G., Kim, A. R., & Hadi, S. (2014). A Methodology to Assess Environmental Vulnerability in a Coastal City: Application to Jakarta, Indonesia. Ocean & Coastal Management, 102, 169-177.

Yasih, D. W. P. (2022). Normalizing and Resisting the New Precarity: A Case Study of the Indonesian Gig Economy. Critical Sociology, 08969205221087130.

Yusuf, A. A. & Fransisco, H. (2009). Climate Change Vulnerability Mapping for Southeast
Asia. Singapore: Economy and Environment Program for Southeast Asia (EEPSEA).

Authors Biography

Suraya Abdulwahab Afiff, Ph.D.
Permanent lecturer at the Department of Anthropology, Faculty of Social and Political Sciences, University of Indonesia, and Senior Research Fellow at the Asia Research Center, University of Indonesia (ARC UI). Her research interests include issues of unequal access to and control over land and natural resources, rights-based development, Reducing Emissions from Deforestation and Forest Degradation (REDD), and the Indonesian agrarian and environmental movements.

Inaya Rakhmani, Ph.D.
Permanent lecturer at the Department of Communication Studies, University of Indonesia and Director of the Asia Research Center, University of Indonesia (ARC UI). Her research interests are political economy of knowledge culture and interdisciplinary studies.

Diatyka Widya Permata Yasih, Ph.D.
Permanent lecturer at the Department of Sociology, University of Indonesia, and Deputy Director for Academic Affairs at the Asia Research Center, University of Indonesia (ARC UI), with interest is in social studies, especially labor sociology.

Dr. Bayu Asih Yulianto
Lecturer at the Maritime Security Study Program, Defense University of the Republic of Indonesia, and Senior Research Fellow at the Asia Research Center, University of Indonesia (ARC UI), with concentration of studies on social politics, especially sociology of defense and resilience.

Jauharah Fitriah, S.Sos.
Research manager at the Asia Research Center, University of Indonesia (ARC UI), and researcher in institutional and policy reform in the knowledge sector.

Setyo Manggala, S.Sos.
Assistant lecturer at the Department of Communication Studies, Faculty of Social and Political Sciences, University of Indonesia, and researcher at the Asia Research Center, University of Indonesia (ARC UI). Also a photographer and activist with an interest in community development.

UNIVERSITAS INDONESIA
Veritas, Probitas, Iustitia

ARC UI
ASIA RESEARCH CENTRE
UNIVERSITAS INDONESIA

Mainstreaming Climate Resilient, Low-Carbon Development Plans: The Case of the North Coas of Jakarta Special Capital Region