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Introduction

This climate change profile is designed to help integrate climate actions into development activities. It complements the publication ‘Climate-smart = Future-Proof!’ – Guidelines for Integrating climate-smart actions into development policies and activities’ and provides answers to some of the questions that are raised in the step-by-step approach in these guidelines.

The current and expected effects of climate change differ locally, nationally and regionally. The impacts of climate change effects on livelihoods, food and water security, ecosystems, infrastructure etc. differ per country and region as well as community and individual, with gender a particularly important vulnerability factor. This profile aims to give insight in the climate change effects and impacts in Indonesia with particular attention for food security and water. It also sheds light on the policies, priorities and commitments of the government in responding to climate change and important climate-relevant activities that are being implemented, including activities being internationally financed.

Summary

The shocks of climate change are already being felt in Indonesia, with more frequent droughts, heat waves and floods, and will pose an increasing threat to the country’s development. A World Bank analysis ranked Indonesia 12th among 35 countries that face high mortality risks due to multiple hazards, including tsunamis, floods, landslides, droughts, and earthquakes. About 40% of Indonesia’s population is at risk of such hazards, and their number will increase under climate change which is likely to exacerbate droughts on southern islands, floods and cyclone intensity across the country, and sea level rise effects in coastal areas. Food security and water availability will be heavily affected by temperature increase, shorter growing seasons, unpredictable rainfall, and salt-water intrusion. By 2100, climate change impacts will cost an estimated 2.5-7% of GDP6.

Overall ranking

While ranking 98 out of 181 countries for per capita GHG emissions5, Indonesia ranks 10th in country emissions contributing an estimated 1.64% of global emissions5. Much of Indonesia’s GHG emissions (an estimated 65.5% in 2013) are from land use change and forestry (LUCF) dominated by emissions from forest land4.

For vulnerability to climate change Indonesia ranks 105 out of 181 countries in the ND-GAIN index6 (2017). Indonesia is the 78th most vulnerable country and the 74th least ready country – meaning that adaptation challenges still exist, but that Indonesia moderately ready to combat climate change effects. Vulnerability measures the country’s exposure, sensitivity, and ability to cope with the negative effects of climate change by considering vulnerability in six life-supporting sectors: food, water, ecosystem service, health, human habitat and infrastructure. Readiness measures a country’s ability to leverage investments and convert them to adaptation actions by considering economic, governance and social readiness.

Biophysical vulnerability

Current climate. Indonesia is the world’s largest archipelagic state, encompassing more than 17,000 islands6. Indonesia is generally dominated by a tropical rainforest climate7. Due to the presence of warm waters around these islands, the country’s temperatures are fairly constant over the year, around 28°C for the coastal plains, 26°C for the mountain areas, and 23°C for higher mountains. Rainfall varies between 1800 and 3200 mm for lowlands, increasing with elevation, up to 6,000 mm in some mountain areas. Most rainfall occurs during the wet season that lasts from November to April (with a rainfall peak in January and February). The dry season lasts from May to October (with July-September as driest months). Indonesia is affected by various types of natural disasters, including floods, droughts, earthquakes, tsunamis, and volcanic eruptions8.

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2 https://en.actualities.com/country/wld/c02-emissions-per-capita/
3 Analysis of World Bank data (2011 dataset)
5 GAIN index summarizes a country’s vulnerability to climate change and other global challenges in combination with readiness to improve resilience. http://index.gain.org/country/indonesia
Current trends. Some climatic trends have been observed in Indonesia. Surface temperatures have increased at a rate of 0.04 °C per decade over the last 30 years. Reported total temperature increases range from 0.64 °C for 1960-2006 to 0.76 °C for 1985-2005 (see Map 1). This increase is similar for all seasons, but there are some regional differences: more rapid increases are reported over the larger islands in the west of the country. The frequency of ‘hot days’ and ‘hot nights’ has increased significantly between 1960 and 2006, especially during the driest months (July-September), by 24% and 26%. At the same time, the frequency of cold nights has decreased by 6.8%.

Total annual rainfall has increased by 12% over the last 30 years (see Map 2). These trends are greatest for the driest season (July-September), where decreases of 4.8% have been reported. There are some regional differences: total rainfall has increased in northern regions but decreased in southern regions. In both cases, the proportion of rainfall occurring during the wet season has increased – suggesting increased intensity of dry and wet seasons. The frequency of intense 1-day and 5-day rains however has decreased, indicating a trend towards higher but more uniform rainfall during the rainy season. In addition, the wet season has tended to start later than normal in some regions; for parts of Sumatra and Java, delays of 20 days were reported for 1991-2003 compared to 1960-1990 while the dry season starts 10-60 days earlier. In general, rainfall predictability is decreasing.

There is a trend towards an increase in extreme events. While droughts occurred once every 4 years before 1960, they are now reported to occur every 3 years.

Climate change. Temperature increase is likely to continue by 0.2-0.3 °C per decade, with a total increase estimated at 0.9-2.2 °C by the 2060s and 1.1-3.2 °C by 2100. Projected warming is more rapid for larger islands than for the sea and small islands. ‘Hot days’ and ‘hot nights’ are expected to occur on 48-95% of days and 63-99% of nights by the 2090s, while ‘cold nights’ are expected to occur no more by the 2060s (each compared to 10% of days/nights in the 1960s).

An increase of annual rainfall is most likely for Indonesia on the national level (models project changes ranging from -1% to +5% by 2100), but large variations per season are expected:

• the onset of the dry season (April-June) may experience a rainfall increase of 10% by 2050;
• rainfall during the peak of the dry season (July-September) is however expected to decrease by 10-25% by 2050 – with peak decreases up to 75%;
• moreover, the probability of a 30-day delay in the onset of the rainy season is expected significantly by 2050 (30-40% probability, compared to 9-18% today).

Regional rainfall projections are appreciably different: the easternmost islands are expected to experience rainfall increases up to 15% by the 2090s;
• Borneo may receive 10-30% more rainfall during the rainy season by 2080;
• rainfall on southern islands (Java, Bali, Nusa Tenggara) will decrease by 5-15% (especially in the dry season) by 2100, while the delayed onset of the rainy season will be largest for these regions;
• for Sumatra, projections vary from large increases to major decreases – especially in the south of the island; a decrease in length of the rainy season is however generally expected.

The proportion of annual rainfall that falls in heavy events is generally projected to increase by up to 15% by the 2090s. Maximum 1-day and 5-day rainfalls are also expected to increase by up to 86 mm for 1-day maxima and up to 123 mm for 5-day maxima by the 2090s. Especially for regions south of the equator (including Java and Bali), wetter wet seasons as well as dryer dry seasons are expected.

Due to higher evapotranspiration, erosion and deforestation, the recharge of rainwater into the soil will decrease. This means that the replenishment of the groundwater resources...
Climate change will decrease considerably, leading to lowering groundwater tables and empty wells, lack of drinking water and lack of irrigation water for the gardens/fields.

Due to rainfall changes, extreme events including droughts and floods will increase in southern regions of Indonesia. For the future, droughts (especially during El Niño events) are expected to have more serious impacts on the south than temporary rainfall increases – although shorter and more intense rainy seasons will probably lead to more intense floods18 (see Map 3 and Map 4). The frequency of tropical cyclones is projected to decrease with climate change, but their intensity could increase19.

An additional effect of climate change is sea level rise, which could have a major impact along Indonesia’s 81,000 km of coastline. Sea level rise in the country is projected to occur at about 5 mm per year, although estimations that consider melting ice dynamics are much higher (see Map 5). Conservative estimates project a total sea level rise of 40 cm by 2100 for Southeast Asia; less conservative estimates project a similar rise by 2050 and a total sea level rise of 1.75 m by 2100. A total sea level rise of 50 cm, combined with ongoing land subsidence in Jakarta Bay, could permanently inundate Jakarta’s and Bekasi’s densely populated areas (affecting 270,000 people). A 1-meter sea level rise could flood 405,000 hectares of coastal lands and indirectly affect an additional 1 million hectares, particularly in northern Java, eastern Sumatra, and southern Sulawesi. It would affect 17 million people in the country and affect 39% of the GDP in coastal regions21. Map 6 indicates which (densely populated) regions may directly or indirectly be affected by sea level rise.

These changes will affect food security and water availability. Water deficits due to climate change have already been reported for Bali and East Nusa Tenggara, while food deficits resulting from climate change occur in various regions including South Sumatra and Lampung, East Kalimantan and Papua22.

In the future, climate change will affect water availability and food security in Indonesia in a number of ways:
- saltwater intrusion due to rising sea levels will decrease freshwater availability in coastal zones23;
- river flow reductions will decrease inland water availability24 and promotes saltwater intrusion in the rivers (see Map 7);
- decreased rainfall in the dry season limits overall water availability, while a lack of water recharge and storage mechanisms in soil or surface water storage reservoirs limits opportunities for balancing this with increased rainfall in the rainy season25;
- temperature increase will increasingly limit general crop productivity, leading to estimated food deficits of 90 million tons of husked rice by 205026;
- crop failure risks will increase due to reduced durations and unpredictable starts of the rainy season (while in some southern regions durations are already too short) and decreasing rainfall predictability27;
- food production will occasionally suffer from increasingly severe floods across the country;
- food production in southern regions (including Java, Bali and Nusa Tenggara) will occasionally suffer from increasing frequency and intensity of droughts28;
- production of specific crops, including rice, will suffer significantly from the projected decrease in number of cold nights during the planting season29;
- more crop pests and diseases will occur as a result of increased temperatures30;
- erratic and intense rainfall will make preservation of crops and seeds more difficult31;
- the availability of fish for consumption, a crucial source of nutrients and indispensable part of the diets of many Indonesians, will be negatively affected by rising sea water temperatures and levels32.

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18 Climate Change and Water Resources in Indonesia (2009); Soesilo (2014); Syaukat (2011)
20 World Bank (2014); Wingqvist and Dahlberg (2008); Karmalkar et al. (2012); Case et al. (2007)
21 Syaukat (2011); Climate Change and Water Resources in Indonesia (2009)
22 Case et al. (2007); Climate Change and Water Resources in Indonesia (2009)
23 World Bank (2014)
24 Naylor et al. (2007)
25 Syaukat (2011)
27 Oktaviani et al. (2011); World Bank (2014); Wingqvist and Dahlberg (2008)
29 Wingqvist and Dahlberg (2008)
30 Lassa et al. (2014)
31 UK’s Met Office Hadley Center (2013); Case et al. (2007)
Socio-economic vulnerability

Key facts:
- GDP (PPP) per capita (2016): USD 11,612.1
- Population (July 2017): 267,991,379
- Projected population (2050): 301,551,000
- Population density per km² (2016): 144
- Human Development Index (2016): 113 out of 188 countries
- Corruption Perceptions Index (2016): 90 out of 176 countries
- Gender Inequality Index (2016): 105 out of 188 countries
- Adult literacy (2015): 93.9% (male 96.3%; female 91.5%)

Indonesia is vulnerable to climate change due to its high population density – especially in coastal areas, and strong dependence on natural resources for income generation and consumption. The island of Java is especially vulnerable because it is home to two-thirds of Indonesia’s population and over half of the country’s poor. Vulnerability for food security is high due to the country’s dependence on the production of rice, the primary staple food, which is projected to decrease as a result of climate change. Poverty of a large part of the population (110-140 million live on less than USD 2 per day) decreases their adaptive capacity to the effects of climate change. A study on vulnerability and adaptive capacity to climate change, including physical and socio-economic factors, has resulted in three comprehensive maps (Map 8, Map 9 and Map 10). In addition to these maps, a report from 2011 contains detailed maps at local level with data on coping capacity, including projections up to 2060. They can be downloaded from http://adaptasi.dnpi.go.id/filedata/20120730112852.Ringkasan%20Eksekutif%20Pemetaan.pdf.

Among Indonesia’s most climate-change-vulnerable populations are small-scale farmers, due to their strong dependence on natural resources including land and water, and their limited access to improved technologies and inputs and alternative livelihood options. In general, inhabitants of rural areas (58% of Indonesia’s total population) have limited access to appropriate climate-smart agricultural information, technologies and finance that could increase their adaptive capacity. Another vulnerable group is Indonesia’s (rural and urban) poor, who often spend more than 50% of their income on food and will be heavily affected by increasing food prices due to climate change.

The agricultural sector is very important for Indonesia, as it accounts for nearly 14% of GDP and the livelihoods of 42% of the working population, including more than half of poor households. It depends heavily on natural resources including land and water (the sector accounts for 80% of Indonesia’s water consumption). Effects of climate change will negatively impact the agricultural sector in various ways (see above), leading to an estimated 17.9% decrease in total agricultural productivity per unit area by the 2080s.

Rice is by far the most important crop of Indonesian agriculture in terms of production as well as consumption. Other important production crops (in order of cultivated area) are oil palm, maize, coconut, rubber and cassava. Important consumption crops (in order of volume consumed) are cassava, vegetables, fruits, maize, and coconuts. Projections for climate change effects on some of Indonesia’s crops (maize, wheat and soybeans) are all negative, with maize yields declining up to 50% and wheat yields decreasing 36.3% by 2080.

For rice, Indonesia’s primary crop, projections indicate major yield decreases ranging from 4% per year to a total of 16.5% between 2000 and 2080. Climate change affects rice production in various ways:
- each 1°C change in temperature causes lower rice quality and yield losses of 1.3 million metric tons or 10-25% of total production;
- a 60cm sea level rise strongly reduces rice yields, e.g. by 300,000 tons in two west Java districts. In some rural coastal districts of Java, inundation is expected to reduce rice production by 95%.

- Lassa et al. (2014); Oktaviani et al. (2011)
• a 30-day delay in wet season onset decreases rice yields by 6.5-11%, prolongs the ‘hunger season’, and may ultimately prevent farmers from planting two consequent rice crops.
• Most of Indonesia’s rice is produced in Java and Bali (together 55%). Food security of the country as a whole therefore depends heavily on climate effects and adaptation in these regions.

The fishery sector is also expected to experience negative effects from climate change, leading to a decrease in food security. Sea level rise will disrupt coastal fish and prawn farming, and changing marine species distributions will make fish catches less reliable. Indonesia is expected to experience some of the largest decreases in marine fish stocks across the globe, with maximum catch potential decreasing by 23% between 2005 and 2055. Although the aquaculture sector in Indonesia is growing, it will not be able to compensate for the losses in the capture fisheries sector.

National government strategies and policies

Indonesia has ratified the UN Convention on Biological Diversity (CBD), the Convention to Combat Desertification (CCD), the Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Indonesia signed the Paris Agreement on climate change in April 2016 and ratified the agreement in October 2016 with it entering into force in November 2016 (see Nationally Determined Contributions below). Other milestones in Indonesia’s climate change strategies and policies are the submission of its First and Second National Communications on climate change (1999 and 2011), the establishment of a National Commission on Clean Development Mechanisms (2005), the National Action Plan addressing climate change (2007), and the Indonesian Climate Change Sectoral Roadmap (ICCSR, 2009).

In recent years, there have been important developments in Indonesia with regard to climate change mitigation and adaptation. Acknowledging that it is one of highest global GHG emitters mainly due to the conversion of its forests and carbon-rich peat lands, the country has focused on mitigation and specifically on reduction of GHG emissions. In 2009, Indonesia made a voluntary commitment to reduce its GHG emissions by 26% by 2020, or by 41% with international assistance, compared to its estimated emissions in a ‘business as usual’ scenario. Most of this goal (87%) is to be achieved by reducing emissions from deforestation and peatland conversion. To achieve this, the Indonesian President signed a decree in 2011, putting into effect a two-year moratorium on issuing new permits for the use of primary natural forest and peat land. The moratorium covers 43.3 million hectares of forest and peat land, and ca. 25.3 gigatons of carbon stocks. The moratorium was extended for another two years in 2013 and was extended again in April 2016. These commitments have made Indonesia one of very few ‘non-Annex I countries’ of the UNFCCC (i.e. non-industrialised/OECD countries) that enacted significant and comprehensive regulations for GHG emissions reduction.

Despite these positive developments, there are significant challenges implementation of the plans – partly due to a lack of capacity and alignment on provincial and local levels, but also largely as a result of the influence of the palm oil industry. A study of forest cover change in 2013 found that the rate of deforestation actually increased to two million hectares per year (from an estimated 750,000 – 1,000,00 per year) during the moratorium.

The Indonesian Ministry of Forestry (later to be merged with the Ministry of Environment) claimed that part of this is ‘temporary deforestation’ which will be compensated through reforestation, leading them to a much lower deforestation figure of 450,000 hectares.

51 https://news.mongabay.com/2016/05/indonesia-extends-forest-moratorium-ft-freeze-really/
52 https://www.mongabay.com/2016/05/ effective-will-indonesias-palm-oil-permit-freeze-really/
While planning for mitigation is advancing, planning for adaptation is still in process. In 2012, Indonesia prepared a National Adaptation Action Plan on Climate Change (RAN-API as a precursor of its National Adaptation Plan (NAP)). The RAN-API contains specific targets for seven sectors and areas: Food security; Energy security; Health; Settlement; Infrastructure; Urban areas; and Coastal and Small Islands areas. These sectors do not include the water sector. The sections on the food security and infrastructure sectors however do mention water aspects. The RAN-API priorities have been cited in Indonesia’s NDC as adaptation priorities. Indonesia has not submitted its NAP to the UNFCCC secretariat.

Nationally Determined Contribution (NDC)

Indonesia submitted to the UNFCCC its First NDC in November 2016. In its NDC, Indonesia presents itself as a poor country, balancing poverty reduction priorities and climate change challenges. Indonesia’s NDC is built upon four strategic principles:

1. Employing a landscape approach: a landscape approach recognizes that adaptation and mitigation are multi-sectoral in nature, therefore Indonesia takes an integral approach covering terrestrial, coastal and marine ecosystems.

2. Highlighting best practices: scaling up traditional wisdom as well as innovative mitigation and adaptation efforts by governments, private sector and communities.

3. Mainstreaming climate agenda into development planning: Indonesia includes key climate change indicators in formulating its development program targets.

4. Promoting climate resilience in food, water and energy: protecting and restoring key terrestrial, coastal and marine ecosystems to fulfill the needs of a growing population for food, water and energy.

Mitigation. In its NDC based on its most recent emissions level assessment, Indonesia has set unconditional (national) reduction target of 29% and a conditional target (subject to availability of international support for finance, technology transfer and development and capacity building) of up to 41% of the Business-as-Usual (BAU) scenario by 2030. In the NDC, Indonesia states that it already took significant steps to reduce emissions from Land Use, Land Use Change and Forestry (LULUCF) and is committed to transitioning its current development pathway towards low carbon and climate resilience in a phased-approach. The pathway towards decarbonization of the economy will be fully integrated into Indonesia’s National Medium-Term Development Plan for the period 2020-2024. REDD+ will be an important component of the NDC target for lowering emissions from the land use sector.

Adaptation. In its NDC, Indonesia refers to its National Action Plan on Climate Change Adaptation (RAN-API, see section above) for a framework for adaptation initiatives. These initiatives are also integrated into the National Development Plan.

Climate finance

Due to Indonesia’s high GHG emissions, estimates of the annual funds required for mitigation are high but varied ranging from USD 925 million to 19.36 billion or more. Although climate finance is not yet up to that figure, there is certainly a momentum on climate finance in Indonesia. The country has been very successful in mobilizing funding. This success in mobilizing funding can be attributed at least partly to the fact that Indonesia’s current focus on mitigation resonates with current climate finance priorities.

The success of both mitigation and adaptation activities depends to a large extent on the ‘readiness’ of Indonesia to not just mobilize climate funds but also use them effectively. An assessment of the current situation of climate financing and the legal and institutional framework in the country suggests four necessary actions to improve climate finance readiness. These are: (1) to support capacities to multi-level planning, programming and coordination; (2) institutional strengthening to meet financial access requirements; (3) to provide good financial governance, including sound measurement, reporting and verification systems; and (4) to increase efforts to engage the private sector. Engagement with the private sector is of special interest since the private sector already makes up the greater proportion of mitigation investment in Indonesia, focusing on renewable/clean energy and energy efficiency. There are currently more than 60 REDD+ demonstration activities developed or supported by private companies. It is anticipated that the Indonesian Climate Change Trust Fund (ICTF), established in 2009 as the financial mechanism for Indonesia’s climate change policies and programmes, can be a mechanism for private-public collaboration.

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58 http://www4.unfccc.int/ndcregistry/PublishedDocuments/Indonesia%20First/First%20NDC%20Indonesia_submitted%20to%20UNFCCC%20Set_November%20%202016.pdf
59 Republic of Indonesia (2015). Intended Nationally Determined Contribution. Available via http://www4.unfccc.int/Submissions/NDC/Published%20Documents/Indonesia/1/INDC_REPUBLIC%20OF%20INDONESIA.pdf
60 Tänzler and Maulidia (2013)
Indonesia’s Centre for Climate Finance and Multilateral Policy (within the Ministry of Finance) is the National Designated Authority (NDA) for the Green Climate Fund (GCF)\(^{61}\). Indonesia is a contributor to the Green Climate Fund and is engaged in strengthening its institutional capacity for project preparation and implementation.

**Climate change projects**

There are many climate change related projects being implemented in Indonesia – some under international climate funds, others through bilateral support or the multi-donor ICCTF (which has provided over grants to over 60 projects since 2016). Currently implemented projects with relevance for the water and/or food security sectors include:

- ‘Public Awareness, Training and Education Program on Climate Change Issues for All Levels of Societies in Mitigation and Adaptation’, supported by the ICCTF\(^{62}\);
- various projects (147 in total) registered the Clean Development Mechanism (CDM) of the UNFCCC, most of them on green energy including hydropower\(^{63}\);
- ‘Green Prosperity Project’ of the USA’s Millennium Challenge Corporation (MCC), to support Indonesia’s plans for a less carbon intensive future (focusing on renewable energy, improved land use management, protection of natural capital and reduced GHG emissions; 2013-2018);
- ‘Knowledge Centre on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resource Sectors’, an online knowledge centre for Southeast Asia, supported by the Southeast Asian Regional Centre for Graduate Study and Research in Agriculture (see [http://climatechange.searca.org/](http://climatechange.searca.org/)).

For a list of international and multilateral climate projects in Indonesia, see the [Annex](#).

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\(^{62}\) ICCTF website: [http://www.climatefundsupdate.org/listing/icctf](http://www.climatefundsupdate.org/listing/icctf)

\(^{63}\) [http://cdm.unfccc.int/Projects/projsearch.html](http://cdm.unfccc.int/Projects/projsearch.html)

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**Climate contribution of the Netherlands**

The Netherlands supports climate-relevant programmes in Indonesia through a variety of channels and in cooperation with range of actors with a focus on food security, water resources management and renewable energy:

- **Food security program**: ‘smart’ technologies and practices will be promoted for horticulture, dairy production and animal husbandry and promoting ‘blue economy’ (sustainable oceans) for fisheries.
- **Water resources management**: the water programme contains elements focusing on flood safety in vulnerable coastal areas and urban delta’s and capacity development on climate and weather. In addition, the embassy will intensify its position as knowledge centre on peatland management.
- **Renewable energy**: the energy programme will focus on strengthening capacity in developing, exploring and utilizing geothermal energy sources and to assess its impact on the economy and environment.
- **Education**: in its higher education programme, the Netherlands offers scholarships to students in areas related to climate change (including food security and water management).
Maps
Map 1  Trends and projections in temperature, 2000-2020, °C increase over 20 years

Source: Measey (2010)

Map 2  Trends in precipitation (September-November season), 1900-2000, mm over 100 years

Source: Measey (2010)
**Map 3**  Projected drought risk under climate change, 2025-2030

![Drought Risk Map](image)


**Map 4**  Projected flood risk under climate change, 2025-2030

![Flood Risk Map](image)
Map 5  Projected sea level rise, 2000-2050, cm/year (including melting ice dynamics)

Map 6  Zones at risk of sea level rise effects and population density
Map 7  Water shortage risk under climate change, 2025-2030

Hazards include:
- cyclones
- floods
- landslides
- droughts
- sea level rise

Source: Republic of Indonesia (2009)

Map 8  Multiple climate hazards

Hazards include:
- cyclones
- floods
- landslides
- droughts
- sea level rise
Map 9  Adaptive capacity to climate change

Adaptive capacity includes:
- socio-economics:
  - human development index
  - poverty
  - income inequality
- technology:
  - electricity
  - irrigation
- infrastructure:
  - road density
  - communication

NB: high adaptive capacity (dark purple) is positive since it implies higher ability to deal with climate change effects.
Map 10  Composite climate change vulnerability, combining hazards (map 8) and adaptive capacity (map 9) with population density

Vulnerability hotspots:
- West Java (floods and landslides, high population density)
- Jakarta (high adaptive capacity, but exposed to multiple hazards and densely populated)

http://www.preventionweb.net/files/7865_12324196651/MappingReports.pdf
Annex

International and multilateral climate projects (since 2012)
**Main source**  Climate Funds Update (2017)\(^{64}\) and World Bank (2017)\(^{65}\)

<table>
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<tr>
<th>Name of Project</th>
<th>Fund</th>
<th>Amount of Funding Approved (USD millions)</th>
<th>Disbursed (USD millions)</th>
<th>Dates</th>
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<td>2010-2013</td>
</tr>
<tr>
<td>Readiness preparation grant</td>
<td>Forest Carbon Partnership Facility (FCPF)</td>
<td>8.8</td>
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<td>Third National Communication to the United Nations Framework Convention on Climate Change</td>
<td>Global Environment Facility (GEF5)</td>
<td>4.5</td>
<td>4.5</td>
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</tr>
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<td>Sustainable management of agricultural research and technology dissemination (SMARTD)</td>
<td>World Bank</td>
<td>80</td>
<td></td>
<td>2012</td>
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<tr>
<td>Jakarta urgent flood mitigation project</td>
<td>World Bank</td>
<td>139.6</td>
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<tr>
<td>Water resources and irrigation sector management program 2</td>
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<td>150</td>
<td></td>
<td>2011 (active)</td>
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<tr>
<td>Geothermal Clean Energy Investment Project</td>
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<td>175</td>
<td></td>
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</table>

\(^{64}\) [http://www.climatefundsupdate.org/data](http://www.climatefundsupdate.org/data)
