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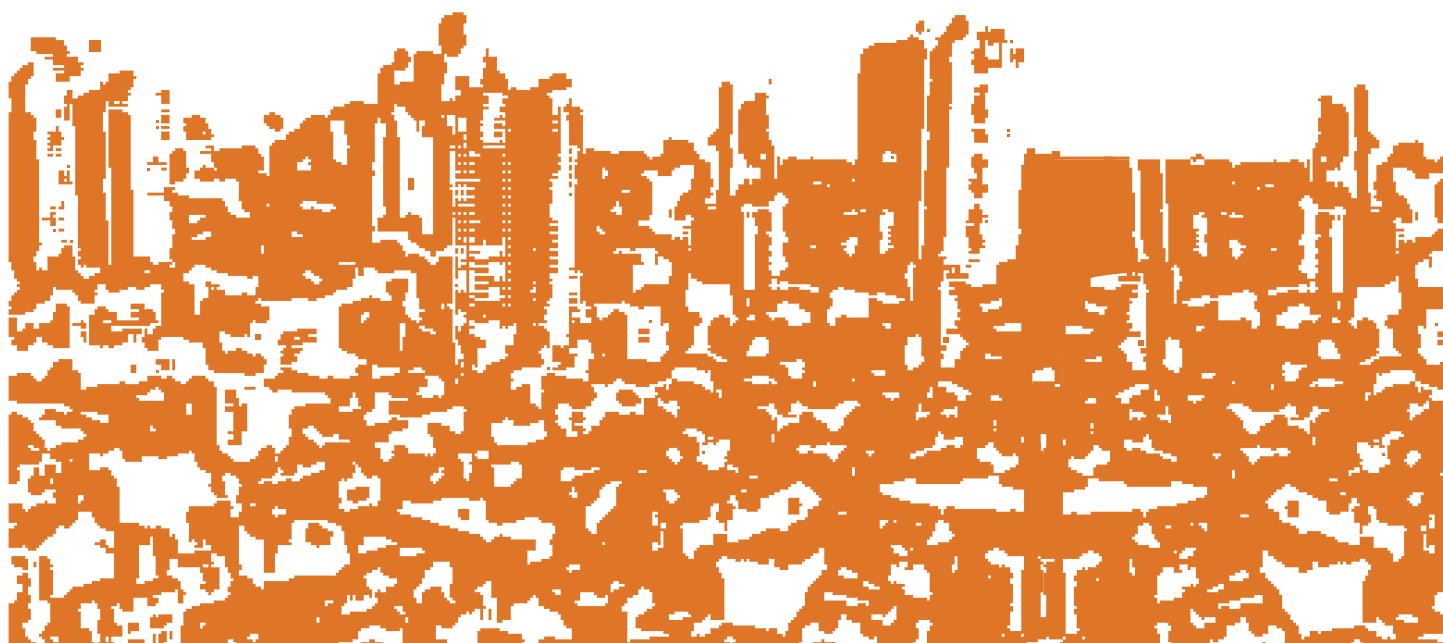
# Asian Cities Climate Resilience

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## **Perspectives of planners on adaptation to climate change in Indonesia**

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# About the author

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# Abstract

This paper focuses on understanding what knowledge local planners at city, regional, and provincial levels have regarding climate change adaptation (CCA), and what informs their perceptions and understanding. Four main themes were investigated: their perception of climate change impacts on local communities; the level of CCA policy development; the extent of CCA mainstreaming in the development agendas of local governments; and the level of planning for CCA. The findings were derived from the perspectives and insights of 26 local planners, working for local governments from seven different Indonesian coastal cities. Several significant factors that need to be addressed in order to plan for and implement effective CCA and disaster management at local levels in Indonesia were identified. These included increased climate change awareness at local levels; the level of coordinated efforts of government and non-governmental organisations required to enable CCA; increased capacity development to enhance community resilience; access to financial incentives and programmes; and greater motivation to address climate change impacts to enable CCA development.

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# 1 Introduction

It is predicted that a change in extreme weather and climate events such as sea-level rise, heavy precipitation, long droughts, heat waves, and wind and storm surges will occur more frequently worldwide in the future (IPCC 2007). The increasing frequency of climate-related extreme weather events, such as droughts, floods, landslides, wildfires and windstorms as well as dramatic coastal erosion in Indonesia over the last century (1907–2007) tend to agree with that view (Pribadi 2008). Poor nations such as Indonesia are likely to be hardest hit by such severe impacts, which pose real threats to any achievement of national development goals and the Millennium Development Goals (MDGs).<sup>1</sup> With most Indonesian people living in natural resource-dependent communities and about 30 per cent living in areas less than 10 metres above average sea level, productive sectors such as agriculture, fishing and forestry are most vulnerable to climate change impacts. According to *Badan Pusat Statistik (BPS)* (or Statistics Indonesia) in 2002, 60 per cent of the Indonesian labour force live in rural areas, of which 45 per cent work in the agricultural sector (Honda 2005; Orden *et al.* 2007). Similar statistics are reflected in the fishing sector, especially in relation to increasing risks and threats to coastal communities of sea-level rise and more frequent storms (Yoseph-Paulus 2012). Cities such as Jakarta, Padang and Semarang and other coastal cities are also facing more frequent floods as a result of steadily increasing sea-level rise and intensive rainfall, threatening livelihoods, homes and lives. To effectively respond and adapt to the increasing frequency of such events, it is imperative that Indonesia develops effective climate change adaptation (CCA) policies and measures at all levels.

Although Indonesian policy makers have taken some measures to address the issue, currently a lack of capacity, coordination and financial resources amongst government agencies are evident – in particular at the local level (Yoseph-Paulus 2012). These areas need to be addressed, especially that of local government considering their imperative roles in climate change mainstreaming and increasing local community resilience to climate change impacts. This study addresses a problem of real significance in responding to governmental objectives of addressing the development of local urban CCA. It provides practical knowledge that can inform policy development in this key area widely recognised as crucial for successful adaptation to the adverse impacts of climate change. Overall, this timely study offers valuable insights into perhaps the most urgent environmental problem that humanity has faced, at least in the contemporary era.

This study is intended to contribute to developing effective responses to CCA and disaster risk reduction (DRR) at the local level. It focuses on linking the responses to development policy to better manage natural resources while protecting vulnerable coastal communities. Aiming to understand the knowledge of local planners and what informs their local perceptions and understanding, four main themes were investigated. These included: perceptions of climate change impacts on local communities; the level of CCA policy development; the extent of CCA mainstreaming; and the level of planning for climate change. Twenty-six local planners working for seven local governments across Indonesian urban coastal cities were interviewed to perceive their perceptions and insights about the development of CCA and DRR in their regions. This is transferable knowledge to other needy Indonesian localities and cross-jurisdictional ones, both globally and regionally.

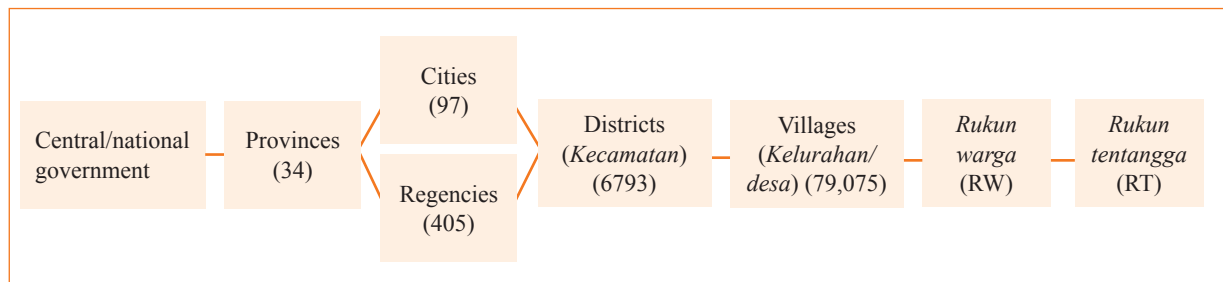
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<sup>1</sup> The Millennium Development Goals (MDGs) are global targets for addressing extreme poverty in relation to hunger, disease, lack of adequate shelter and exclusion, and promoting gender equality, education and environmental sustainability (see Millennium Project 2006).

## 2 The Indonesian policy context on climate change and disaster risk reduction

Indonesia has three levels of government: the central or national government; 34 provinces; and 97 urban local authorities (cities) and 405 rural local authorities (regencies), as shown in Figure 1 (Kemendagri 2013). These respective governments have the authority to draft their social economic development plans according to Law No. 25/2004 concerning the national development planning system and spatial plans according to Law No. 28/2008 on spatial planning. They include the 20-year-term regional spatial plan called *Rencana Tata Ruang Wilayah* or RTRW and the long-term *Rencana Jangka Panjang Pembangunan* or RPJP development (which also covers a 20-year period), which is specified in the five-year period or mid-term development plan called *Rencana Pembangunan Jangka Menengah* or RPJM (Bappenas 2010). Development in Indonesia centres on these planning documents.

Figure 1. The structure of Indonesian government<sup>2</sup>



*Kecamatan* and *kelurahan/desa* (or districts and villages) are the representatives of cities or regencies at the smallest administrative levels. The last two government levels not included in the division of the government administration are *rukun warga* or RW (community associations) and *rukun tetangga* or RT (neighbourhood associations). *Rukun tetangga* consist of 30–50 houses/households, while a *rukun warga* usually consists of five to ten *rukun tetangga*. Established by the community, these organisations aim to maintain and preserve the value of life in Indonesian society based on *gotong-royong* (mutual cooperation) and *kekeluargaan* (kinship) as well as to extend community services delivered by the village (Government of Indonesia 1983). Such an effort may include the effort to increase community resilience to the risks and threats posed by climate change.

<sup>2</sup> Numbers stated are very likely to grow where regional development policy divides jurisdictional areas (*pemekaran wilayah*) in line with the implementation of regional autonomy.

Numerous policies and measures have been developed by the Indonesian government to address climate change adaptation, mitigation and disaster risk reduction (see Table 1). Most policies are initiated and implemented by central government, while the effort of local governments (provinces and cities/regencies) is limited and tend only to extend the central government's policies. Additionally, the policy environment is still dominated by climate change mitigation responses, while adaptation is the focus of this study.

In researching Indonesian climate change policy development, Yoseph-Paulus (2012) found several causes for the lack of CCA and DRR policies and measures at the local levels. They included the lack of awareness and capacity of local governments to specifically secure financial resources, and the lack of any governance mechanism at all government levels to effectively address CCA and DRR. The lack of financial and policy support, described by Carmin *et al.* (2012) in their global survey on urban climate adaptation planning, also posed a significant challenge to CCA mainstreaming at local levels. In response, the Indonesian government launched a trust fund called the Indonesian Climate Change Trust Fund (ICCTF) in 2009 (Brown and Peskett 2011). It specifically finances climate responses by linking international finance sources with national investment strategies. Sectoral ministries and local government bodies as well as non-governmental organisations (NGOs) are eligible to access this trust fund. The Indonesian government also enhanced its regional collaboration with the Association of Southeast Asian Nations (ASEAN) and other developing countries with similar situations to fight this global challenge. In this effort, international development agencies and bilateral organisations such as UNDP, Global Environment Facilities (GEF), AusAid, *Japan International Cooperation Agency (JICA)*, *Gesellschaft für Internationale Zusammenarbeit (GIZ)*, World Bank, Asian Development Bank (ADB) and other multinational organisations have assisted local governments to enhance their local responses, often with a particular focus on urban governments.

At a more local level, initiatives include piloting community-based adaptation done by the Red Cross/Red Crescent Centre of Climate Change and Disaster Preparedness, and integrating CCA and DRR through a UNDP programme called Safer Communities through Disaster Risk Reduction (SCDRR) (AIPA 2012). According to a report by the ASEAN Inter-Parliamentary Assembly (AIPA) in 2011, 12 villages on Java Island, including Bantul, participated in this village-resilience initiative. The Asian Cities Climate Change Resilience Network (ACCCRN) and UN-Habitat through its Cities and Climate Change Initiative (CCCI) have also developed other local-level initiatives with an urban focus in Indonesia. Notably, these initiatives are driven by external organisations rather than national or local governments.

Table 1. Milestones of Indonesia's climate change adaptation and mitigation and disaster risk reduction policies

Year	Policy development	Institutions and other initiatives
1966		National coordination for natural disasters
1979		Established National Disaster Management Coordinating Board – Bakornas PBA
1992		Signed the United Nations Framework Convention on Climate Change (UNFCCC)
1994		Established National Committee on Climate Change (NCCC); ratified UNFCCC
1999	First National Communication	
2003		Revitalisation of NCCC
2004	Mid-term national development programme (RPJMN 2004–2014)	Ratified Kyoto Protocol
2005		Established Designated National Authority (DNA) – Clean development mechanism (CDM)
2006	National Action Plan for Disaster Risk Reduction (NAP-DRR)	
2007	RANPI (National CCA Plan); Disaster Management Law Number Law No. 24/2007	Hosted UNFCCC COP 13 in Bali; REDDI (Reducing Emissions from Deforestation & Forest Degradation in Indonesia)
2008	Yellow Book (National Development Planning Response to Climate Change)	Established NCCC to identify and develop national policy regarding climate change; National Disaster Management Agency (BNPB) and its local counterparts (BPBD) act as the lead agencies for DRR coordination at local levels
2009	Green paper proposal on economic and fiscal policy strategies for climate change mitigation	Law No. 31/2009 and 32/2009 as two government regulations concerning responses to climate change; established the Indonesia Climate Trust Fund (ICCTF) to link international finance sources with national investment strategies
2010	ICCSR or sectoral roadmap: a planning document with sectoral adaptation priorities including water resources, the coastal zone and fishing, agriculture, health, forestry and infrastructure	Promotion of adaptation section parallel to mitigation at the Ministry of Environment;  Indonesia Green Investment Fund (IGIF); National Guidelines for Disaster Management 2010–2014
2011	Second National Communication; RAN and RAD-GRK (national and local action plans for emissions reduction)	National Platform for DRR (Planas-PRB); guidelines for CCA for agriculture sector; guideline for developing local action plans for GHG reduction (RAD-GRK)
2012	RANMAPI (national actions to address climate change) by the Ministry of Public Works; second NAP-DRR for 2010–2012	

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## 3 Approach and methodology

The face-to-face interview questionnaire utilised a semi-structured process to maintain some structure and consistency across all respondents. This was to enable comparative analysis, while also allowing each respondent to be probed on points of individual interest. Twenty-six planners from local government agencies, both at provincial and city/regency levels were interviewed. The aim was to investigate local planners' practical reasoning and knowledge in relation to capacity-building enhancement and effective CCA at local levels. The respondents have been local government officers with at least 10 years' experience. Downstream public participation as a CCA response must first be developed through these actors (Yoseph-Paulus 2012). Nineteen respondents or 73 per cent were from the regional development planning agencies (*Bappedas*) while the remaining were planners from other government agencies such as community empowerment, public works and forestry.

A set of open-ended questions (see Table 3) was carefully developed to examine how effective planning practices and capacity enhancement are at the local level in adapting to climate change impacts. The questions built on key findings on documentary research and adapted from earlier doctoral research (Yoseph-Paulus 2012), which examined effective CCA policy development, focusing in particular on sectoral coordination and building adaptive capacity at the local level in Indonesia, especially with vulnerable coastal communities.

The questions were organised into five sections. The first probed the interviewees' backgrounds, professional roles and organisations to assess their authority to respond to the issues under scrutiny, particularly on issues of climate change, environmental management or sustainable development. The remaining sections investigated participants' perceptions on the four defined key themes: climate change impacts on local communities; adaptation policy development status; CCA mainstreaming; and planning for CCA (see Table 2). Interviews were conducted in Indonesian and quotes included in this study were translated by the author. The interview data was interpreted and analysed according to the five stages of analysing qualitative interviews by McCracken (1988). They include observation of transcripts to make notations, developed observation to produce descriptive codes, detailed examination of the identified descriptive codes to produce interpretive codes by identifying connections and developing pattern codes, identification of basic themes, and further examination the identified themes to define major themes. After making a detailed examination of the transcripts, descriptive and interpretive codes were developed, identifying connections, pattern codes and basic themes, from which major themes were then identified. This technique records reflections and analyses, allowing for the systematic reconstruction of the participants' worldviews.

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Table 2. Key themes and interview questions

Themes	Interview questions
Climate change impacts on local communities	<ul style="list-style-type: none"> <li>■ What do you understand the likely effects/impacts of climate change on local communities to be?</li> <li>■ Who would you describe as the stakeholders most responsible for CCA in Indonesia? Has it always been this way (also in relation to broader environmental management or sustainable development)?</li> <li>■ What key factors do you think are necessary to address climate change impacts on local communities?</li> </ul>
Perceptions of CCA policy development status	<ul style="list-style-type: none"> <li>■ What problems do you see regarding CCA policy development at the local level?</li> <li>■ What has your organisation done to address barriers to CCA policy development at the local level?</li> <li>■ To what extent do the current CCA policies at the national and local levels address those challenges?</li> </ul>
Mainstreaming CCA into development agendas of local governments	<ul style="list-style-type: none"> <li>■ What key factors do you think are necessary to mainstream CCA into the development agendas of local governments in Indonesia, especially related to building the adaptive capacity of vulnerable coastal communities?</li> <li>■ What role or potential roles do or should local communities have in mainstreaming CCA?</li> <li>■ Are you aware of any initiatives to engage local communities in the effort to mainstream CCA?</li> </ul>
Planning for CCA	<ul style="list-style-type: none"> <li>■ What has your organisation done to plan for climate change impacts and environmental management in general?</li> <li>■ What problems do you anticipate regarding planning for CCA?</li> <li>■ Do you have any ideas/suggestions for how to address these problems?</li> </ul>

Considering the economic, geographical and cultural diversity of Indonesian local governments, a comparative investigative approach was used to select field sites to better represent problems on the ground related to local planner capacity enhancement for policy development of CCA. Interviews were conducted during August and September 2013 at seven coastal urban cities on major Indonesian islands: Sumatra, Java, Nusa Tenggara, Sulawesi and Papua (see Figure 2).

In eastern Indonesia the city of Mataram on Lombok Island in West Nusa Tenggara Province was selected as the only small island in Indonesia to have comprehensively mainstreamed climate change responses into its local development agenda. Baubau in Southeast Sulawesi Province, Palu City in Central Sulawesi Province and Jayapura in Papua Province were also selected as cities with insignificant or fewer adaptation projects than Mataram.<sup>3</sup> Importantly, these coastal communities are relatively similar in geographical characteristics, level of development and vulnerability to climate change events. They were first assessed as to whether any programmes were under development and how adaptive capacity was being addressed in relation to their knowledge with and without mainstreaming. In western Indonesia, the cities of Banda Aceh in Aceh Province, Padang in West Sumatra Province, and Bantul in Yogyakarta Province were selected. These are urban areas that have more advanced development-planning documents and policies than those in eastern Indonesia for addressing climate change impacts.

3 In addition, Baubau is also the author's hometown and workplace as an environmental planning officer focusing on climate change. Because of this, the author is very familiar with the area and has better access than an 'outside' researcher would have to other planning officers for interviews and key documentation.

Figure 2. The field sites of Baubau (B), Banda Aceh (A), Padang (S), Bantul (Y), Mataram (M), Palu (P), and Jayapura (J).



Source: [www.wikiadapt.org/index.php?title=Indonesia](http://www.wikiadapt.org/index.php?title=Indonesia).

All these selected cities are provincial capitals except Bantul and Baubau cities, yet they have each become the development centre of their regions. Banda Aceh, Padang and Bantul are highly populated and urbanised cities and very prone to major disasters such as tsunamis and earthquakes. Banda Aceh was severely affected by the tsunami of December 2004 and Bantul experienced a significant earthquake in 2006. These cities have subsequently developed relatively comprehensive disaster risk reduction plans. Padang, for example, as the capital city of West Sumatra Province, became the first to enact local regulation or *perda* on disaster management in 2008–2012. It established its local agency for disaster management (BPBD) in 2008. Mataram has highly developed tourism and marine industries, as well as being highly accessible, and, next to Bali, is one of the world's most famous tourist destinations. The city has received substantive assistance from national and international development agencies. Combined with a progressive local government, this has resulted in the island being the only one in Indonesia where a comprehensive vulnerability and adaptation (V&A) study has been conducted by central government. Baubau, Palu and Jayapura have expanding tourism and fishing sectors, but are less accessible than Lombok and at this stage receive less assistance from external sources. With fewer CCA projects than Mataram, they represent most of the small cities in Indonesia with similar characteristics. The main characteristics of these municipalities are summarised in Table 3.

Table 3. The main characteristics of the cities investigated

Cities/municipal government	Population (2011)	Climate and disaster risks	Climate change and DRR-related policies
Mataram	371,045	Small island, tornadoes, coastal erosion, sea-level rise	Lombok Island, where Mataram is located, was the first to develop a regional action plan in 2007
Baubau	139,717	Small island, tornadoes, coastal erosion, sea-level rise	Dissemination of climate information conducted by Meteorology, Climatology and Geophysics Agency (BKMKG)
Palu	342,754	Earthquakes, Palu-Koro Fault	Participated in Safer Communities through Disaster Risk Reduction (SCDRR) programme funded by UNDP
Jayapura	271,012	Landslides, floods	
Banda Aceh	228,562	Tsunami (2004)	Introduced tsunami early-warning system and local community training
Padang	844,316	Earthquake (2009), tornadoes, coastal erosion, sea-level rise	In 2008, Padang was the first city to introduce local regulation ( <i>perda</i> ) on disaster management for West Sumatra
Bantul	921,263	Earthquake (2006), tornadoes, coastal erosion	Participated in SCDRR; Community Protection Unit as a leading institution to handle disasters

Source: Ministry of Environment 2010; Sardjunani and Hadi 2010; UNDP Indonesia 2011; AIPA 2012

With such diversity, these cities offer valuable insights into current CCA and DRR initiatives in Indonesia and policy actors' perspectives on them. This includes their perspectives on local conditions and values, and especially relating to the capacity development of local planners to address climate change and other development issues in their regions.

## 4 Findings

Findings and analyses are presented in four broad categories. They include climate change impacts and stakeholders; challenges faced by the government, communities, and other stakeholders; opportunities to promote CCA and DRR; and recommendations identified by respondents for the development of climate change responses at local levels. To achieve an adequate depth of analysis, the narratives for analysis included only issues raised by two or more respondents (n>2). Exceptions were made, however, for narratives with lesser voters but considered worth probing for CCA and DRR development at local level.

### 4.1 Climate change impacts and stakeholders

#### 4.1.1 Climate change impacts on local communities

When asked how they perceive climate change impacts in their cities, interviewees identified four main narratives. Fourteen respondents (54 per cent), especially from the cities of Mataram and Banda Aceh, mentioned that extreme weather events and variability had become more evident in their regions, such as heavy rainfall, floods, prolonged draughts, and uncertainty in planting and harvesting times. Twenty-three per cent of respondents specified secondary impacts by stating that sectors on which most local community livelihoods had relied on, for example agriculture and fishing, had been negatively impacted by climate change. Twenty-three per cent of respondents (6 people), however, argued that climate change still had insignificant impacts on local development activities causing, perhaps, the reluctance of local government to undertake local CCA development. In addition, since this was an open-ended question, the responses varied in what could be perceived as climate impacts. Coastline changes, the disappearance of several fish species, infrastructure damage and an increase in the number of children suffering from malnutrition, were mentioned by only 8 per cent of respondents – as well as the fact that some cold-intolerant plants such as date palms and coconut could now grow well in what had been relatively colder or mountainous areas.

#### 4.1.2 Stakeholders most responsible for addressing climate change impacts

When asked which stakeholders are most responsible for addressing climate change impacts, almost all respondents (73 per cent) agreed that regardless of one's job title and role in society, everyone is responsible for effectively responding to the threats and risks posed by climate change. On the one hand, this may indicate an actualisation of the *gotong royong*<sup>4</sup> spirit. On the other hand, these government officials seem to be suggesting that they are not solely responsible, or perhaps some of them failed to specifically identify the responsible sectors due to their lack of awareness.

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<sup>4</sup> *Gotong royong* is a traditional practice of mutual cooperation among people living in the same community, deriving from a traditional Javanese village custom to secure labour through reciprocal exchange (Mardiasmo and Barnes 2013: 1).

Other respondents provided further explanations, which could be divided into three narratives. First, 27 per cent of respondents argued that the most affected government sectors such as fishing and agriculture should be at the forefront of action on climate change. This is because it is the government's responsibility to produce regulations and to enhance the awareness of local communities to increase their resilience to climate change impacts. Second, 19 per cent of respondents affirmed that government policy makers should be able to embrace communities and their institutions at all levels, including universities and the private sector, to actively participate in combating the negative impacts of climate change. A senior local planner from Palu emphasised that education institutions such as universities in the region should more actively participate in assisting local government, especially regarding local community awareness raising. Third, 15 per cent of respondents affirmed that government should be able to encourage the active participation of the private sector through the utilisation of corporate social responsibility (CSR) scheme for community resilience enhancement and other community development issues.<sup>5</sup> In Padang, for example, several companies utilised their CSR budget for mangrove planting, coral reef planting, and enlarging green open spaces such as parks and green paths in the city that could be used to support evacuation during disasters.

## 4.2 Challenges facing CCA and DRR at local levels

### 4.2.1 Government

Respondents identified several problems hindering government responses to the development of adaptation in Indonesia, especially at the local level and in relation to broader environmental management or sustainability. Their main responses formed six narratives. First, almost 73 per cent of respondents (19 people) argued that climate change was still relatively a new issue for most local governments in Indonesia. Adaptation, in particular, was an issue that is only discussed by bureaucrats and not during policy making processes, thus hindering the implementation of policy at the local levels. Until recently, most local government institutions, including sectors highly affected by climate change impacts, for example fishing and agriculture, were still not sure what to do. They were seemingly too preoccupied by routine activities to address emerging local community needs to effectively address threats posed by climate change. A planner from Mataram, for example, argued that climate change was not as interesting a political commodity as poverty reduction issues. Also, a lack of dissemination of central government regulations has resulted in a lack of adaptation implementation and uptake at the local levels, as respondents APC, BKA, and JPB relayed.

*Even though the central government has produced many regulations to respond to climate change issues... their dissemination and promotion are still lacking (respondent APC).*

*...Many government personnel, in fact, are still less aware about climate change, especially [since regional autonomy has been implemented, regional governments tend to] frequently transfer the officials responsible for addressing the issue (respondent BKA).*

*The challenge for the promotion of RAD-GRK [Indonesia's local action plan for greenhouse gases (GHGs) reduction] is because as a new issue, the participation of local officials in this local movement is quite low due to their lack of awareness of the issue. Also, this lack is caused by the many different terms used by many people [or agencies] who go to Papua to introduce climate change, especially donor agencies... It is imperative that the definition of RAD-GRK is described in a simple way and easily understood [by local government] ... Unfortunately, the awareness of the issue is only limited to the agency/sector directly involved and participating in capacity development for climate change issues (respondent JPB).*

Furthermore, 50 per cent of respondents believed that the lack of awareness and capacity in local government were also leading to a lack of coordination in effectively responding to climate change, especially concerted efforts by local government sectors and institutions affected by climate change. Although some respondents argued that there were many

<sup>5</sup> CSR is 'a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis' (Commission of the European Communities 2001: 6).

national policies successfully implemented at the local levels, many respondents believed that there were many more to be synchronised with regard to adaptation to climate change. A lack of coordination amongst government agencies still persisted, especially between the central and local levels. It was not uncommon for provincial governments, who are supposed to represent central government at the local level, to be less informed about activities implemented by central government in a city or regency. There were also many policies on natural resources management and CCA still overlapping, for example certain permits for resources management are still being issued by central government regardless of conditions on the ground.

Another reason for the lack of local adaptation mentioned by 39 per cent of respondents was due to the absence of appropriate capacity within central government to respond to climate change. National policies are often quite generalised, often failing to acknowledge necessary adjustments for local capacity and resources that are similarly limited, particularly financial resources. It is not uncommon for national policies to conflict with local ones while not necessarily affecting local policies. For example, local action plans to reduce GHG emissions (RAD-GRK) are an extension of RAN-GRK, a national action plan on GHG emission reductions. As such, they are not regarded as a necessity but as a tool to satisfy a central government requirement. Frequent changes in national policies also tend to cause more confusion in local government. This lack of government coordination and capacity tends to hinder efforts to promote collaborative actions with non-governmental institutions, such as the private sector, NGOs and other development institutions.

Inconsistencies in planning and implementation and insufficient incentives also emerged as problem narratives relating to planning for CCA, supported by 19 per cent of respondents. One official from Palu outlined the importance of a planning and adaptation fund for CCA:

*I think the priority is for an adaptation fund, because money must follow planning, but it is happening quite to the contrary, in which planning follows the money. For example, programmes that were proposed by the community during the Musrenbang forum<sup>6</sup> were the community aspirations and were well accommodated for in the planning process. However, decision makers cut the local budget ... [which] resulted in the programme targets and aims being missed...[even though] we had set the planning to address the needs of the community in accordance with [emerging strategic issues]. Therefore, money must follow planning and not the other way around, so that the root causes of the problem can be addressed (respondent PPK).*

Also, 12 per cent of respondents mentioned that customary lands/communities and especially those in Padang often hindered development for adaptation. A senior planner from this city said that spatial division in West Sumatra Province was hindered by the ownership of customary lands that were hard to manage in the public interest. Most customary lands could not be bought or sold, creating a major barrier for investment development and planning for CCA in this region.

Financing local adaptation action was only mentioned by two respondents (SPF and BPH) saying that the private sector could potentially finance local adaptation through CSR initiatives.

## 4.2.2 Community

The local government planners and officials participating in this study identified five narratives regarding challenges to community participation in developing climate change responses at the local level. First, 42 per cent of respondents argued that the community's lack of awareness in protecting the environment and their engagement in destructive activities such as illegal fishing and logging for short-term economic benefits were still taking place due to poverty and lack of jobs. These respondents also believed that the increasing trend of climate variability and extreme events had enhanced the vulnerability status of these coastal communities. Raising community awareness through the use of information and technology to address climate change similarly plays a significant role in mainstreaming CCA, which was mentioned by 31 per cent of respondents. The promotion and dissemination of climate change information through public meetings, radio, television, newspaper, Internet, campaigns targeted at schools, and other awareness-raising efforts have been used to

<sup>6</sup> Musrenbang is an annual process during which residents meet together to discuss issues facing their communities and to decide on short-term priorities. See <http://solokotakita.org/en/planning-tools/musrenbang>.

enhance community awareness. However, the absence of information and appropriate technology provision by the sectors most affected by climate change impacts might become a significant barrier to mainstreaming.

Raised by 19 per cent of respondents, the limited capacity of local communities to influence government policy was another barrier to effective climate change responses. One respondent from Baubau stated that:

*Our [governance system] is not yet at a stage in which, for example, local communities can directly ask the government to accommodate their needs into the development agenda of local government (respondent BKA).*

Also, the influence of customary institutions in an already heterogenic city like Jayapura is limited to certain interests, making them less effective in promoting collective actions to advance local CCA and DRR actions.

### 4.2.3 Other stakeholders

A strong commitment from all related stakeholders, both government and non-governmental institutions, is also imperative to promote the implementation of adaptation actions at local levels. Such a commitment tends to be more challenging to perform, especially for decentralised Indonesia. For example, central government seems reluctant to share some of its power with local government, a problem that goes beyond CCA and DRR development.

## 4.3 Successes in the development of CCA and DRR at local levels

### 4.3.1 Government

There were three narratives advanced by respondents regarding the promotion of effective government responses to the local development of CCA and DRR. The first, mentioned by 10 people or 38 per cent of respondents, related to awareness based on appropriate knowledge and the commitment of local decision makers. According to a planner from Palu:

*...all local decision makers need to have a basic understanding regarding climate change issues, although climate change terms are not directly employed... but environmental protection approaches are used, allowing local decision makers to identify and address environmental issues and then to insert them into the RPJMD [medium-term development plan of local government], renstra [strategic plan], and [more importantly] into the renja [work plan] of every government sector and institution as our annual work plans (respondent PKD).*

A strong commitment is required to implement two regulations concerning development and spatial plans, which are imperative since Central Sulawesi Province is susceptible to disasters. Therefore, development plans in this region should be based on spatial planning and disaster mitigation. This idea is unpopular amongst some local planners (respondent PPK). However, another official also emphasised the importance of this spatial planning regulation and implementation, which has promoted the existence of several green open spaces in every village:

*Based on discussions with colleagues, we believe it is important for every RT and RW to have their own green open spaces [...] to minimise disasters by having enough space for evacuation [...] A disaster just recently happened in Aceh, which resulted in many casualties which could have been prevented if they had adequate building construction and spaces for evacuation (respondent PKS).*

Inserting adaptation plans into local regulation and planning documents was supported by 35 per cent of respondents. As the first province in Indonesia to have mainstreamed climate change responses into its local development agenda, government officials of Mataram City and Nusa Tenggara Province participating in this study argued that including adaptation plans in local regulation and planning documents was imperative. This mainstreaming effort encompasses the creation of local regulations to specially address climate change issues, which includes environmental protection and spatial planning (RTRW) into new local regulation and planning documents (RPJPD and RPJMD), as the basis of

development in Indonesia at all government levels. Several provinces and the central government have already mandated the insertion of climate change adaptation planning into their development agendas. The issue of food security, for example, was included in the RPJM Aceh 2012–2017 as adaptation to climate change – even though it was not explicitly stated as a response to climate change, but as a general development challenge instead.

A concerted effort by government sectors and institutions responsible for addressing adaptation was also considered imperative by 27 per cent of respondents. One planner from Mataram mentioned that responses to climate change had been recognised in the RPJMD 2013–2018 of Nusa Tenggara Province, indicating a realisation of the need for good sectoral coordination amongst government sectors, especially those most affected by climate change. This small island government had 13 government agencies to address climate change impacts – therefore the enhanced coordination of programmes and activities for CCA and DRR responses amongst those agencies should be imperative.

### 4.3.2 Community

When asked what role or potential roles could be played by the local community to enhance local responses to CCA and DRR, all respondents of this study referred to the *musrenbang*. This is an annual coordination meeting among governmental agencies conducted and coordinated by planning agencies at all government levels, in which the active participation of local communities is encouraged. Other than the *musrenbang*, three major narratives were identified:

- The role of NGOs, especially local ones, to encourage the active participation of communities in protecting the environment and enhancing climate change awareness was mentioned by 23 per cent of respondents.
- A similar percentage of respondents talked about the daily roles of the local community to advance CCA and DRR. This included avoiding activities destructive to the environment, promoting small-scale waste management at home and within the neighbourhoods (RT and RW), and planting mangrove trees and coral reefs.
- Revitalising *gotong royong* was also mentioned by 19 per cent of respondents, especially those from Aceh and Yogyakarta, cities which had experienced large disasters. This was more in terms of disaster recovery rather than planning or preparing for future impacts.

Certainly, aside from the *musrenbang*, the capacity of local communities is still limited to asking for their needs to be accommodated into development agendas. However, for some local governments where the local culture is still upheld such as in the cities of Padang and Aceh, the role of community leaders and customary and community institutions may be significant. According to a senior official of Padang:

*Community leaders need to be more active to raise the awareness of the community to safeguard the environment. In Padang we have [customary and community institutions such as] Kerapatan Anak Nagari (KAN), Tungku Tigo Sajarangan, Bundo Kandung... They conduct meetings among the members before meeting with the government to discuss various issues pertaining to their welfare [...] and also youth organisations ... [Their] roles are still very strong in Padang. If the customary and community leaders say 'no' to an activity, then that activity will not be pursued (respondent SKB).*

Because of the lack of any role for customary institutions, the role of RT and RW or neighbourhood associations has become necessary. This kind of community forum is more commonly practiced in Indonesian societies that have become more heterogenic. In this forum, the community discusses issues related to their welfare, including climate change impacts.

The use of community institutions and mechanisms to protect and enhance the economic development of local communities to promote CCA and DRR development was mentioned by 12 per cent of respondents. They included the *Gerakan Pensejahteraan Petani (GPP)* Programme (a farmers' movement) to promote the development of the agriculture sector in the area, and the *Terpadu Pemberdayaan Masyarakat Pesisir (GEPEMP)* or Integrated Coastal Community Empowerment Programme, as well as a programme for the development of *usaha mikro, kecil dan menengah (UMKM)* to support local community involving in micro, small and medium enterprises (SMEs) along with the *Jaminan Kredit Daerah*

or Jamkrida programme as regional credit guarantee for SMEs. Also, the establishment of community-based institutions, especially for DRR was mentioned by respondents from the cities of Palu and Mataram.

### 4.3.3 Other stakeholders

Regarding the development of local CCA and DRR, only a few initiatives done in collaboration with several stakeholders (especially NGOs and other community institutions) were mentioned by 15 per cent of respondents. In the anticipation of tsunamis and earthquakes, for example, a planner and official from Banda Aceh advocated DRR through the development of sea walls, an early warning system, evacuation facilities and routes, and the dissemination of disaster mitigation approaches and warnings. Also mentioned in Palu was the establishment of a non-structural working group consisting of government officials with shared concerns regarding urban issues. For Padang, the preference was for environmental awareness campaigns with better waste management (improved recycling and not burning waste).

## 4.4 Recommendations for the development of CCA and DRR at local levels

There were many solutions offered by respondents to effectively address CCA and DRR at local levels. Awareness raising and capacity building for local government agencies' emerged as the most popular suggestion promoted by 42 of respondents (11 people). An official and planner from Mataram supported this statement through the following comment:

*By continuing to promote CCA, we hope that the awareness of decision makers at sectors affected by climate change will be enhanced and so they will be able to formulate and develop programmes and activities that are more pro-environment (respondent MKF).*

Along with an increased awareness and commitment of local decision makers and leaders, this will enable them to develop and support the best solutions for action. Personal and institutional development through discussions and collaborations with NGOs was also considered important in planning for CCA and DRR. Also important is the recruitment of skilled and capable government personnel as well as more training for human resources development, especially as this has been less of a priority in local government since the implementation of regional autonomy.

In addition, 38 per cent of respondents felt that CCA and DRR issues should be included in local government planning documents. They believed this was key to CCA and DRR development due to the significant role that government planning documents play, specifically in securing the budgets for CCA and DRR issues. Adaptation measures need to be recognised as the accommodation of community needs and environmental protection and then further developed as strategic development issues. Indeed, stakeholders with adequate capacities, both in government and non-governmental institutions, should be able to develop coordinated actions and work together to enhance each other's strengths and potential to effectively respond to climate change, disasters and environmental issues. All programmes related to climate change responses should be synchronised in such a way that agencies drawing up programmes and activities are directed to address climate change impacts. The respondents argued that such a coordination and synchronisation of related sectors and institutions at the forefront of climate actions should become a role played by Bappeda. The main task is to check programmes developed and supervised by specialised sector and government institutions such as local public works and environmental agencies and then identify which programmes are relevant to CCA and DRR, such as local public works, environment, and disaster management agencies. Indeed, these government agencies need to develop a strong collaboration to address these issues. For example, the role of local health departments should be increased, such as by focusing on the health of post-disaster communities and their environment so that regional water utility companies should be able to supply clean water to the affected areas.

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Formulating policy to enhance sustainable livelihoods to encourage community economic development activities to align with environmental protection efforts was mentioned by 23 per cent of respondents. Thus they are not necessarily related to the impacts of climate change, but rather, to general environmental considerations. For example, government regulations should be directed to the utilisation and processing of fishery and marine products in environmentally friendly ways and with high economic value. It would also be necessary to enhance the capacity of coastal communities whose livelihoods depend on fishery and marine resources, especially women, by providing them with the skills to process higher-value fish products while advocating that their husbands stay away from destructive fishing practices.

Nineteen per cent of respondents felt that the government, especially local agencies at the forefront of climate change responses such as fishing and agriculture, should be obliged to provide environmentally friendly technology and information. This might include, for example, local governments providing timely weather forecasts and planting seasons for farmers and fishermen via radio and television programmes to enhance the community's general awareness and resilience. Other support might include an early warning system and evacuation drills and routes. Furthermore, 19 per cent of respondents also argued that there should be a common will to safeguard and carry out activities based on spatial plans and in synergy with other sectors. In this way, land use could be optimal providing that people's rights are not violated. Such efforts could be implemented by local government agencies formulating appropriate regulations for addressing climate change. Nonetheless, this would be difficult to achieve in the near future, according to official and planner from Banda Aceh:

*Currently, we are still in the stage of planning development or regulation formulation. This is because [...] local regulations for CCA [or other efforts to enhance local community resilience] do not yet exist (respondent APN).*

Another suggestion for addressing climate change impacts on local communities, identified by only 8 per cent of respondents, was the application of visual learning tools to enhance public awareness. Having attended a workshop on disaster mitigation in New Zealand, where public awareness and education for disaster risk reduction had been relatively successfully implemented, an official from Palu stated:

*The results of research studies on climate change should be more communicated to the local community. For example, a million tonnes of sediment reach the Palu Bay every year but the community is not aware of the sedimentation impact [that may lead to worsened impacts of climate change events such as floods]. It is only communicated in workshops and seminars limited to academics. Such study results should be visualised [...] in a simple way to increase public awareness of the issue (respondent PKS).*

## 5 Discussion

The dominant narratives in the previous section are based on the respondents' knowledge, values and preferences relating to climate change impacts, stakeholders, challenges, opportunities and recommendations for local CCA and DRR development. From the point of view of local urban planners, five factors necessary for planning and implementation of CCA and DRR at the local level in Indonesia can be identified. These are: building climate change awareness at local levels; coordinating efforts by government and non-governmental entities to enable CCA; capacity development to enhance community resilience; financial incentives and programmes; and motivation to address climate change impacts to enable CCA development at local levels. These themes will be compared with findings from previous doctoral research (Yoseph-Paulus 2012) and projects/activities done by ACCCRN in promoting urban climate change resilience, as one of the existing urban climate initiatives being implemented in Indonesia.

### 5.1 Climate change awareness at local levels

In understanding how climate change has affected local communities, almost all respondents demonstrated a high awareness of the impacts of this global issue, especially with regard to climate variability and extreme events. Although all the respondents have different roles and responsibilities, it was possible to observe an increase in local government awareness on climate change issues since the original research was carried out in 2009. The introduction to the topic as required in the interview schedule method seemingly became less necessary. Respondents from the disaster-prone cities of Padang, Mataram and Aceh tended to be especially capable in elaborating problems they encountered to CCA development at local levels. However, almost all respondents agreed that the awareness of local decision makers and leaders in promoting CCA was still lacking. This respondents' view could be seen to also reflect the view of Resurreccion *et al.* (2008) that Indonesian local government knowledge and awareness of climate change impacts was inadequate to develop proactive and anticipatory agendas to enable CCA development at local levels.

A lack of community awareness of climate change has been caused by the failure to see its impact on their lives while dealing with other more immediate priorities, as well as the unpredictable future of climate change. Also, natural disasters are still perceived by many communities as an act of God and consequently, fatalistic attitudes often prevail (Willitts-King 2009). This is certainly in line with what was suggested by the study respondents: that helping communities to relate climate change impacts to their own lives while changing this fatalistic view could help to ensure community participation in addressing the issue. Respondents affirmed that universities could play a substantial role in increasing public awareness through the visualisation of climate change. Future visioning of climate change impacts through the use of visual learning tools could make the impacts explicit to local communities, especially in the decision making and planning systems for local community leaders (Appleton *et al.* 2004; Dockerty *et al.* 2006). The development of awareness-raising storylines targeted at community leaders, scientists and experts from sectoral government and non-governmental agencies and institutions as advanced by Yoseph-Paulus (2012) could be significant in the awareness-raising effort. Furthermore, from a workshop conducted by ACCCRN on mainstreaming CCA, public and media pressure could be used to build demand for CCA from government and non-governmental entities, especially for private sector engagement (ACCCRN 2011).

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## 5.2 Coordinated efforts to enable CCA mainstreaming at local levels

All respondents agreed that governments through their related institutions should lead the way in protecting the community from threats and risks posed by climate change. Effective measures need to be employed by the government, especially to increase the resilience of the most disadvantaged and vulnerable coastal communities whose livelihoods heavily depend on the climate, such as low-income fishermen and farmers. In addition, to enhance the government's role, the active participation of the private sector, universities and other community institutions is also imperative. The promotion of a CSR mechanism was seen as an increasingly popular trend as stated by the respondents of this study. In fact to date, only government-owned companies have utilised their CSR fund for addressing environmental issues, including climate change. This is despite the fact that Indonesian corporate and investment laws oblige every corporation to implement corporate social and environmental responsibility activities (Waagstein 2011). It seems that more effort is needed to encourage the participation of private companies' CSR funds to finance CCA and other community-development activities, which is also related to the need to increase awareness amongst the general public of climate change impacts and approaches to adaptation.

Respondents defined planning for CCA as the effort made by local governments to organise activities required to address climate change impacts on the affected sectors; the commitment to plan to accommodate the impacts; and planning development priorities that better address community needs. This includes, for example, the development of a curriculum module for climate change as a campaign tool in schools in Baubau. Funded by the Indonesia Climate Trust Fund (ICCTF) in 2012, the module was developed by a central government agency, which meant that the local government was only an agent for extending the role of central government. This reflects AIPA (2012) who found that the establishment of local disaster management bodies (BPBD) in all provinces and 395 cities/regencies was also initiated by central government.

Similarly, the RAD-GRK, a local action plan for GHG mitigation, was facilitated and coordinated by the Ministry of Home Affairs. Although this plan was introduced in 2011, until recently it was still at stage of promotion or introduction, especially to local decision makers and leaders. This is because as shown in previous research (Yoseph-Paulus 2012), decentralisation is proven to lessen the effectiveness of local measures due to a lack of clarity over the functions of local government and inadequate capacity within local government to administer new functions, especially between cities/regencies and provincial government regarding policy development. Also, sectoral disconnect between central and local government agencies became inevitable since many local government leaders remain unresponsive to laws and policies set up by central government, especially due to a lack of financial and technical support. Effective sectoral coordination and committed engagement of a range of city-level officials working with the ACCCRN team and a wide range of stakeholders including civil society and NGOs, academics and practitioners have become the key to the institutionalisation of CCA to build urban resilience in Semarang and Bandar Lampung (Archer *et al.* in press).

## 5.3 Capacity development

Respondents argued that inadequate capacity and coordination amongst stakeholders to effectively address the issues were still evident, especially among local government agencies and sectors most affected by climate change. Therefore, it is not surprising that CCA remains an elusive issue for most local decision makers, hampering the creation of effective CCA measures and implementation at the local level. For example, local regulations for CCA development that were utterly needed for the promotion of planning for CCA at local levels are relatively non-existent (according to respondent APN). Only a few local governments have issued local regulations and other responses to address climate change and disaster mitigation, such as in Mataram and Padang. Even so, as stated by respondents from these cities, knowledge of the existence of such responses is limited to sectors and institutions directly involved in CCA policies and measures.

The recruitment of skilled and capable personnel was one suggestion by the respondents to enhance the capacity of local governments. They also recommended adequate training and workshops to enhance the institutional capacity of government and non-governmental entities in developing coordinated actions to enhance each other's strengths and potentials, which is imperative for developing effective responses. Lessons from ACCCRN also suggest the integration of CCA knowledge within the ongoing capacity-development agenda of cities through the learning and exchange of local experiences and actions as well as conducting a training needs assessment and developing customised training products, especially for the city's planners to accommodate climate change uncertainties (Kernaghan and da Silva; ACCCRN 2011). These planners must cease to solely depend on traditional modes of planning but balance them with new modes of experimentation and innovation (Carmin *et al.* 2013). Also, the World Bank (2009) found that considering the significant role of the Indonesian central government to the development of CCA policies and measures, developing the institutional capacity of central government agencies is necessary to enhance climate change governance in every sector while encouraging the active participation of local government and non-governmental institutions. Moreover, Dodman (2013) argued that media with adequate knowledge about climate change and funding resources and arrangements was important to inform vulnerable communities about the funds that could be used by their cities to enhance their resilience.

## 5.4 Financial incentives and programmes

Although the respondents of this study seemed quite reluctant to raise the issue of financial incentives, they argued that the existence of adequate financial resources to support local CCA development was key. However, such support was considered too luxurious for most local governments in Indonesia, where many other more urgent and immediate development issues need to be addressed. The amount of public spending allocated to development programmes such as education and research is far less than administrative expenditures (World Bank 2013). It is also necessary for local governments to lessen their dependency on central government incentives and external funding supports to enable CCA promotion at the local levels. If these incentives were to end or be reduced, such dependency may potentially lead to a decline in knowledge and capacity, then inaction. A local drive in itself is required to secure sustained financial and staff resources (Yoseph-Paulus 2012).

While several international adaptation funds are available to build the resilience of vulnerable communities in less developed and developing countries, these funds are rather difficult for cities to directly access (Smith *et al.* 2014). Carmin *et al.* (2013) argue that such challenges associated with external financial sources may include the availability of the external fund, which often does not match the budgetary cycles of the city, and difficulties in monitoring and demonstrating the progress of adaptation measures or satisfying reporting requirements by external funding agencies. Similarly ICCTF, as the national investment strategy to overcome climate change funding deficiencies, tends to require demanding reporting criteria that even local governments find challenging to meet, let alone the local community institutions who find reporting on the use of locally managed funding mechanisms that Mitlin (2013) advocates using beyond their capacity to manage.

The provision of information and technology for fishermen and farmers to enhance community resilience, which respondents considered as inadequate, was also another imperative for effective local CCA development along with the establishment of special mechanisms to protect the community. They included the enhancement of communities' local economic development, particularly for those vulnerable communities whose livelihoods are sensitive to climate change. Examples include measures for the protection of farmers and fishers introduced by local governments, such as in Padang City and West Sumatra Province with the GPP for farmers' protection, GEPEMP for coastal community protection and Jamkrida, which provides regional credit guarantees for SMEs and community-based institutions for disaster mitigation. Corresponding mechanisms have also been developed in other large Indonesian cities such as Surabaya, Solo and Banjarmasin through the creation of non-climatic urban policies related to water supply, riverbank settlements and public information systems (Taylor 2013).

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## 5.5 Motivation to address climate change impacts

Respondents affirmed that being able to relate CCA to existing developmental challenges faced by cities could ensure the engagement of cities' decision makers and leaders in mainstreaming CCA and DRR. This includes the provision of services and infrastructures for environmental protection, spatial planning and disaster management, for example through the development of sea walls, early warning systems and evacuation facilities and routes. This view reflects Parker *et al.* (2012) who found that local communities and other stakeholders would be greatly motivated to engage with mainstreaming CCA if it closely aligned with their existing priorities and needs. Similarly, the enhancement of business opportunities while mitigating the impacts of climate change could encourage private sector participation in CCA (ACCCRN 2011).

Respondents agreed that *musrenbang* as a well-known public forum could have a significant impact in promoting the active participation of local communities in CCA development, through the accommodation and integration of their needs into the development agenda of local government. But several challenges with this mechanism were identified. Communities are sometimes less aware of how issues such as climate change affect their daily lives and also, it is still a challenge for communities to voice their needs. One respondent also added that the *musrenbang* was not be attended by all community members but only their representatives, who were the elites of the villages and not necessarily affected by climate change. Another argued that the members of regional representative councils attended who the *musrenbang* often failed to represent the needs of the local community in general but only accommodated the needs of their voters. Other respondents stated that the involvement of local community leaders and customary institutions was still imperative to encourage the awareness and participation of local communities to enable CCA mainstreaming, particularly for local governments where local culture was still upheld. Otherwise, in heterogenic contexts more common to contemporary Indonesian society, the role of neighbourhood associations played an important role. This reflects Grootaert (1999) who found that RT and RW, customary, and religious groups were widely recognised as being the central locus of collective action and mutual aid for government and social activities within Indonesian villages.

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## 6 Conclusions and recommendations

Through an analysis of the viewpoints of 26 local government officials involved in adaptation planning, a number of insights have been obtained regarding the remaining challenges and constraints on fully planning for and implementing climate change adaptation in Indonesian cities. Although those cities which have already faced large disasters – Padang, Mataram and Aceh – are now some of the most pro-active in both CCA and disaster management, planning to address these issues is still limited and only discussed among the bureaucracy. It is not yet at the stage of policy making which is hindering its implementation at the local levels. Most local government institutions, especially in those sectors most affected by climate change, are still lacking the capacity and resources to best understand the development of adaptation in their localities. Also identified as significant for the promotion of CCA and DRR issues is relating climate change impacts to communities' lives and changing their fatalistic views on the causes of these impacts. This can be done, for example, through the use of future visioning and awareness-raising storylines developed by community leaders, scientists and experts from sectoral government and non-governmental institutions.

Another tactic for mainstreaming CCA and DRR is the insertion of CCA into local regulations and planning documents through the creation of regulation and documentation to specially address the issue of climate change. Also, requirements for planning CCA measures could also be inserted into new, less-specific government regulations and documents. Existing local regulations and documents could also be revised.

The significant advisory roles of NGOs and other development agencies to collaborate with local governments to enhance community roles should be actively encouraged to promote CCA and DRR, especially by central government. This includes creating a simple mechanism so that local governments can have direct access to ICCTF along with the promotion of the role of the private sector through the use of their CSR programmes to address climate change and disaster management funding deficiencies. Learning from externally driven initiatives such as ACCCRN and CCCI can also provide both support and resources for initiating and sustaining urban adaptation.

Persistent efforts are needed to raise the awareness of communities and decision makers, to increase the personal and institutional capacity within the affected sectors and to enhance collaborative and coordinated actions amongst stakeholders. Finally, the provision of adequate funding and technical support are imperative for the development of effective adaptation policies and measures at the level of local government in Indonesia.

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# Acronyms

ACCCRN	Asian Cities Climate Change Resilience Network
AIPA	ASEAN Inter-Parliamentary Assembly
ASEAN	Association of Southeast Asian Nations
Bappenas	<i>Badan Perencanaan Pembangunan Nasional (Indonesia's National Planning and Development Agency)</i>
Bappeda	<i>Badan Perencanaan Pembangunan Daerah (Indonesia's Regional Planning and Development Agency)</i>
CCA	<i>Climate Change Adaptation</i>
CCCI	UN-Habitat Cities and Climate Change Initiative
CDM	Clean Development Mechanism
COP	UNFCCC Conference of the Parties
CSR	Corporate Social Responsibility
DNA	Designated National Authority
DRR	Disaster Risk Reduction
GHG	Greenhouse Gases
ICCTF	Indonesia Climate Trust Fund
IPCC	Intergovernmental Panel on Climate Change
MDG	Millennium Development Goals
NAP-DRR	National Action Plan for Disaster Risk Reduction
NCCC	National Committee on Climate Change
RAD-GRK	Indonesia's local action plan for greenhouse gas (GHG) emission reductions
RAN-GRK	Indonesia's national action plan on GHG emission reduction
REDDI	Reducing Emissions from Deforestation and Forest Degradation in Indonesia
RPJMD	<i>Rencana pembangunan jangka menengah daerah (medium-term development plan)</i>
RPJMN	<i>Rencana pembangunan jangka menengah nasional (national medium-term development plan)</i>
RPJP	<i>Rencana Jangka Panjang Pembangunan (long-term development plan)</i>
RT	<i>Rukun tetangga (neighbourhood associations)</i>
RTRW	<i>Rencana Tata Ruang Wilayah (regional spatial plan)</i>
RW	<i>Rukun warga (community associations)</i>
SCDRR	Safer Communities through Disaster Risk Reduction (UNDP-funded programme)
UNDP	United Nations Development Fund
UNFCCC	United Nations Framework Convention on Climate Change

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# Perspectives of planners on adaptation to climate change in Indonesia

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## **Asian Cities Climate Resilience Working Paper Series**

This working paper series aims to present research outputs around the common theme of urban climate resilience in Asia. It serves as a forum for dialogue and to encourage strong intellectual debate over concepts relating to urban resilience, results from the ground, and future directions. The series is also intended to encourage the development of local research capacity and to ensure local ownership of outputs.

The series has arisen out of the Asian Cities Climate Change Resilience Network (ACCCRN, [www.acccrn.org](http://www.acccrn.org)), an initiative funded by the Rockefeller Foundation.

The series is intended to present research in a preliminary form for feedback and discussion. Readers are encouraged to provide comments to the authors whose contact details are included in each publication.

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