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Assessment of adaptation needs, policies and priorities: cases from Indonesian islands

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The *Partner Report* Series highlights the insights and outcomes of studies, assessments and other field activities that our national implementing partners have undertaken in their countries to mainstream adaptation into plans, policies and programmes. The intention of the series is to disseminate their findings to partners and relevant professionals in Asia.

We welcome suggestions or comments.

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Disclaimer

Editor: Marion Davis

Front & Back Cover: Water temples in Bali
Photo Credit: Albert Salamanca

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Preface

Over the last three years, the Regional Climate Change Adaptation Knowledge Platform (AKP) has worked to building bridges between existing knowledge on climate change adaptation and the governments, agencies and communities that need this knowledge to inform their adaptation to the impacts of climate change, while working for poverty reduction and environmental sustainability. AKP's work has been carried out following three key objectives:

1. Promoting dialogue and improving the exchange of knowledge, information and methods within and between countries on climate change adaptation, and linking existing and emerging networks and initiatives.

2. Generating new climate change adaptation knowledge, promoting understanding and providing guidance relevant to the development and implementation of national and regional climate change adaptation policy, plans and processes focused on reducing vulnerability and strengthening the resilience of the poor and women: the most vulnerable segments of society in most Asian countries.

3. Synthesizing existing and new climate change adaptation knowledge and facilitating its application in sustainable development and poverty reduction practices at the local, national and regional levels.

This publication is a result of these objectives. AKP supported thirteen countries in the Asian region to strengthen their capabilities to introduce effective adaptation measures. This includes undertaking activities at the national, sub-national and local levels to create enabling policy, regulatory, planning and budgeting environments. In each country, the platform facilitated adaptation action and strengthened adaptive capacity.

AKP is implemented by the Stockholm Environment Institute (SEI), AIT's Regional Resource Centre for Asia and the Pacific (AIT RRCAP), and the United Nations Environment Programme Regional Office for Asia and the Pacific (UNEP ROAP) with funding provided by the Swedish Government through the Royal Swedish Embassy in Bangkok and the Swedish International Development Agency (Sida). The former Swedish Environmental Secretariat for Asia (SENSA) was also instrumental in setting up and supporting AKP.

Indonesia is one of the thirteen countries supported by AKP, and this publication highlights the insights gained from the implementation of activities in Indonesia.

AKP's publications provide insights on adaptation in the region. A consolidated initiative, known as the *Asia Pacific Adaptation Network* (APAN), has been established and will be fully implemented starting 2013. Its ultimate objective is to assist the region to build the climate resilience of human systems, ecosystems and economies through the mobilization of knowledge and best practices, enhanced institutional capacity, informed decision making processes, and facilitated access to finance and technologies.

The outcomes of AKP have been made possible by the active participation of partners and various stakeholders. SEI acknowledges the editorial assistance provided by Marion Davis, Joshua Rigg and Pin Pravalprukskul. SEI also expresses heartfelt thanks to John Soussan, Lailai Li, Kai Kim Chiang, Lisa Schipper, Sabita Thapa, Tatirose Vijitpan, Muanpong Juntopas, Nantiya Tangwisutijit, Chanthy Sam, and Dusita Krawanchid for their contributions to AKP.

Executive summary

Assessing the challenges and needs of a locality is an important aspect of adaptation action. This scoping assessment presents an overview of the needs of small islands in Indonesia in adapting to the impacts of climate change and climate variability. The assessment was conducted in September to October 2011 with the assistance of local NGOs and peoples organizations in Indonesia. The assessment conducted several focus group discussions, key informant interviews, meetings and observations in Bali, Nusa Tenggara Barat and Nusa Tenggara Timur. Several important insights emerged. For instance, although the National Action Plan Addressing Climate Change or *Rencana Aksi Nasional dalam menghadapi Perubahan Iklim* (RAN-PI) was adopted in 2007, its implementation has been generally poor. In 2012, the Government of Indonesia started drafting a new adaptation strategy.

The participants of the assessment identified the following research priorities:

- *Suitable innovations to food scarcity:* What technologies and seeds are attuned to a drier climate? How can current assets be used to adapt to climate change and extreme events? How can seed banks be adapted to future climate while maintaining indigenous crops?
- *Adaptation at the local level:* What are the best forms of adaptation for island communities? How do you prepare coastal and small island communities for long-term climate change and future disaster risks?
- *Cross-cutting and fundamental issues:* How much of the survival of groups depends on access to fundamental human rights? What is the human rights angle of adaptation? Would households with better use and access rights to certain resources adapt better to climate change impacts? Are islands legitimate administrative units to demand government services? What are the bargaining rights of small islands? What are the ramifications of migration? Is adaptation a gendered process?
- *Legal priorities:* To what extent do communities rely on rights and legal foundations for adaptation? Would improved rights allow households to more effectively adapt to climate change?
- *Local knowledge:* How do you document local knowledge effectively? How do you link this knowledge to adaptation? How can knowledge be transferred to the next generation? How best to transfer local knowledge between communities? Is the mapping approach, as used by the Centre for the Support of Native Lands, the most effective approach for adaptation?

Capacity-building recommendations were identified, including:

- Identifying and supporting local champions and community institutions, who provide an entry point to the empowerment and capacity-building of the wider community
- Targeting small grants, which distribute funds more effectively than larger grants
- Wherever possible, supporting existing efforts; this requires the acknowledgement of possibly unidentified adaptation and disaster risk reduction techniques.
- Supporting environmental education and technological innovation
- Creating a portfolio of flexible training packages
- Continuing to create climate change field schools *(sekolah lapang Iklim)*
- Building dialogue between scientists and community members
- Ensuring sensitivity to local politics and power hierarchies
- Appreciating that there are always multiple stakeholders; finding and supporting a common agenda has the potential to lead to positive interaction outside climate change issues.
- Creating a local knowledge/wisdom network for the transfer of knowledge between communities and generations

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Editorial assistance provided by Pin Pravalprukskul is gratefully acknowledged.

Thanks also to Marion Davis who patiently improved the language of this report and all other reports of AKP. She not only excels with her craft but is also well informed on the subject matter.

Sunset in Gili Air
Photo Credit: Albert Salamanca

The coastline of South Lombok
Photo Credit: Albert Salamanca

Introduction

Indonesia is the world's largest archipelago, with about 17,500 islands, the world's longest coastline, and some of the world's richest biodiversity (Jepson and Whittaker 2002). It is also the fourth most populated country in the world, with roughly 240 million people as of 2010.[1]

Indonesia is located in the world's most geologically unstable region, the Pacific Ring of Fire, a cluster of fault lines and active volcanoes where earthquakes, tsunamis and volcanic eruptions are common (recently, eruptions from Mounts Kelut and Merapi have been devastating). The archipelago also faces several climate-related hazards such as floods, droughts, storms, landslides and wildfires (Thomalla et al. 2009). These hazards have led to serious humanitarian emergencies. In short, Indonesia faces both geological and hydro-meteorological hazards. With about 40% of inhabitants at risk, Indonesia has been ranked 12th by the World Bank on a list of 35 countries with high mortality risk from multiple hazards.[2]

Climate change is expected to increase the risks for Indonesia, worsening recurring floods and droughts as well as forest fires, and severely affecting food production (see footnote 2).

Most of the national government's actions on climate change to date have focused on mitigation, with a National Action Plan for Reducing GHGs published in 2011.[3] Adaptation, meanwhile, has only recently gained priority. In mid-2012, the National Development Planning Agency (Badan Perencanaan Pembangunan Nasional, or BAPPENAS) and other government agencies began work on a strategy for mainstreaming adaptation into national development planning, with support from the Asian Development Bank and the Japanese International Cooperation Agency. Known as the *Rencana Aksi Nasional Adaptasi Perubahan Iklim* (RAN-API), the strategy builds on the experience of the implementation of the *Rencana Aksi Nasional dalam menghadapi Perubahan Iklim* (RAN-PI) or National Action Plan Addressing Climate Change. A draft of RAN-API is expected in 2013.

The goal of this scoping assessment is to determine the gaps and weaknesses of existing or planned adaptation measures and actions at both the local and national levels, so that proactive actions may be crafted to enhance them. A key policy focus is the implementation of RAN-PI since 2007. The immediate objective of this assessment is to contribute to the formulation of specific and reasonable planned adaptation activities for Indonesia, through which organizations and platforms such as SEI and AKP can contribute to their actualization and implementation. It is not the intention of these partners to pursue these "on their own", but rather, to assist Indonesian partners to strengthen their adaptive capacity.

[1] See United Nations Department of Economic and Social Affairs (UNDESA), *World Population Prospects, the 2010 Revision,* http://esa.un.org/unpd/wpp/index.htm.

[2] For an overview of the hazards faced by Indonesia, see the World Bank's Climate Change Knowledge Portal: http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=IDN&ThisTab=Dashboard.

[3] See a discussion on the website of the Project of Capacity Development for Climate Change Strategies in Indonesia: http://www.greenclimateproject.org/news/detail/2/.

Methodology and approach

This scoping assessment started from the premise that substantial action on climate has already been undertaken throughout Indonesia via the RAN-PI, involving the government, communities, civil society, and bilateral and multilateral agencies. Thus, the assessment focused specifically on adaptation, at two levels:

1. A national-level assessment on the implementation of the adaptation agenda within RAN-PI, and
2. Community-level experiences (or lack thereof) on actions to adapt to climate change.

The national-level assessment included a literature review, in-depth key informant interviews, and consultation meetings/roundtable discussions with key stakeholders. This scoping assessment looked at the operational challenges encountered in the implementation of the RAN-PI activities, and identified options to address these challenges.

At the local level, selected geographically marginal, economically peripheral and ecologically vulnerable provinces were identified for in-depth case studies to: 1) understand the implementation of RAN-PI at the provincial level, and 2) identify a priority course of action that ensures that the goals of RAN-PI are achieved and that the implementation is successful. The overarching goal is to determine the effectiveness of the implementation, as well as to assess how existing modalities are working and/or attuned to local needs and priorities, enhancing the adaptive capacities of communities. If knowledge and capacity gaps are identified, options to remedy them need to be explored. This, in turn, should lead to the identification of specific research priorities by the knowledge users.

This scoping assessment represents the opinions and perspectives of the individuals and organizations that took part in both focus group discussions and interviews. The discussions, which lasted 1.5 to 2 hours each, involved 8-20 individuals each; they were conducted in 10 villages, three *kabupatens,*[4] and three provinces. In addition, a national-level focus group discussion was conducted last, to ensure that insights from the village, *kabupaten* and province-level discussions are reviewed.

All of the focus group discussions were facilitated and organized by local partners. The provincial and kabupaten-level discussions included officers from ministries and departments on agriculture, fisheries, planning, environment, as well as some non-governmental organizations (NGOs) involved in community-based adaptation and disaster risk reduction. The village-level discussions involved primarily farmers, fishers, women and local village officials. At all levels, the groups were dominated by men, especially at the *kabupaten* level, where no more than three women participated, aside from the organizers and facilitators. Given this limitation, the interviews actively sought out women's perspectives. At the national level, the participants were from national ministries and national and international civil society organizations.

Focus group discussion in Kupang
Photo Credit: Albert Salamanca

Scoping partners

The assessment was carried out through a network of civil society organizations, led by the Stockholm Environment Institute's Asia Centre and the Samdhana Institute, in partnership with Telapak, AMAN, Yayasan Wisnu (in Bali), Santiri (in Lombok), the Indonesian Earth Institute (in Jakarta), and GEMA ALAM (in Suela). These organizations did the groundwork for the interviews and focus group discussions. Box 1 provides brief descriptions of the project partners.

[4] Indonesia has 30 provinces, two special regions and one special capital territory (Jakarta). The provinces and regions are subdivided into *kabupaten* (regencies) and *kota* (cities), which are further subdivided into the *kecamatan* (districts), and then into *desa* or *kelurahan* (villages).

Box 1: Organizations involved in the scoping assessment

Stockholm Environment Institute (www.sei-international.org)
SEI is an independent, nonprofit international research institute specializing in sustainable development and environmental issues, working at the local, national, regional and global policy levels. Its Asia Centre, based in Bangkok, coordinated this project and synthesized the findings with the Samdhana Institute.

Samdhana Institute (www.samdhana.org)
The Samdhana Institute is a community of practitioners based in Bogor, Indonesia, founded in 2003 by conservationists, development practitioners, and human rights activists. Its activities include the administration of a small grants program in collaboration with the Global Green Grants Network, Packard Foundation, NORAD, the Ford Foundation, IUCN-LLS, American Jewish World Service and the Foundation for the Philippine Environment.

AMAN (aman.or.id)
Aliansi Masyarakat Adat Nusantara, the Indigenous Peoples Alliance of the Archipelago, is an independent social organization composed of indigenous peoples' communities. It serves as the umbrella organization of indigenous peoples pursuing their sovereign rights to the land they inhabit. It has 1,696 members throughout Indonesia.

Yayasan Wisnu (wisnu.or.id)
Yayasan Wisnu is an NGO based in Keorobokan-Denpasar, Bali, working on environmental issues and social transformation. It was established in 1993, and mainly dealt with waste management until 1999. Since then, it has been working with communities to help them realize their potential through ecotourism.

Telapak (www.telapak.org)
Telapak (footprint) is an association of NGO activists, business practitioners, academics, media affiliates and leaders of indigenous peoples based in Bogor. It works with indigenous communities, fishers, and farmers in Indonesia towards achieving sustainability, sovereignty, and integrity. It works in three main areas: watershed management, sustainable forestry exploitation (e.g. community logging), and supporting social enterprises for indigenous, forest and coastal communities.

Santiri (rumahalir.or.id)
Santiri is an NGO based in Mataram, Lombok. Its main areas of advocacy are sustainable landscape planning, environmental education, and community-based housing development. Santiri is a member of Samdhana and AMAN.

The Indonesia Earth Institute (TIEI)
TIEI is a non-profit organization founded in 2008. Its main concern is to help victims of disasters and to promote disaster risk management. It has developed a community-based early warning system for Mount Kelut. TIEI is actively involved in the National Platform for Disaster Risk Reduction (Platform Nasional Pengurangan Risiko Bencana).

Gerakan Masyarakat Cinta Alam (GEMA ALAM)
GEMA ALAM is a member of the Samdhana Institute Network and facilitates community action to address water scarcity and protect biodiversity.

Brief background of areas assessed

The scoping assessment was conducted in Bali and the Lesser Sunda (Nusa Tenggara) Islands (Lombok in Nusa Tenggara Barat and Timor in Nusa Tenggara Timur), as they are areas that are **geographically marginalized, economically peripheral** and **ecologically vulnerable.** The choice of areas with these characteristics was derived from an understanding of the literature on climate change adaptation, environmental sustainability and development in Indonesia. The assessment covered ecosystems, cultural diversity, human environment, and government.

The Lesser Sunda region is an ecologically diverse region in the Indo-Australian part of the Wallace Line, which delineates the transitional eco-zones of Asia and Australia. The line runs directly through the Lesser Sunda Islands, between Borneo and Sulawesi, and through the Lombok Strait between Bali and Lombok Island. The Sunda Shelf (Sumatera, Java, Borneo and Bali), previously linked to the Asian mainland, has a wealth of Asian animal species and previously was abundant in tigers, rhinoceros, orangutans, elephants and leopards. However, their populations and distributions have drastically dwindled. Sulawesi, Nusa Tenggara and Muluku, having long been separated from the continental land mass, have developed their own unique flora and fauna (Monk et al. 1997), while Papua has unique flora and fauna that are closely related to those of Australia.

Bali is predominantly inhabited by the Hindu Balinese, Lombok by the Muslim Sasak, and West Timor by the Christian Timorese. However, due to limited budget and time, the scoping assessment was done on three larger islands (Bali, Lombok and Timor) and three small islands (Gili Air, Nusa Lembongan and Nusa Ceningan). By Indonesian standards, Bali, Nusa Tenggara Timur and Nusa Tenggara Barat have mid-size populations (Table 1).

Table 1: Population of selected provinces in Indonesia in 2010

Province	Population in 2010
North Sumatra	12,982,204
Special Capital Territory of Jakarta	9,607,787
South Sulawesi	8,034,776
South Sumatra	7,450,394
West Sumatra	4,846,909
Nusa Tenggara Timur	**4,683,827**
Nusa Tenggara Barat	**4,500,212**
West Kalimantan	4,395,983
Bali	**3,890,757**
South Kalimantan	3,626,616
East Kalimantan	3,553,143
Central Sulawesi	2,635,009
North Sulawesi	2,270,596
Southeast Sulawesi	2,232,586
Central Kalimantan	2,212,089
INDONESIA	**237,641,326**

Source: Badan Pusat Statistik, http://www.bps.go.id/eng/tab_sub/view.php?kat=1&tabel=1&daftar=1&id_subyek=12&notab=1.
Note: population data include non-permanent residents (homeless, sailors, boat people and remote-area communities).

Table 2: Poverty rate, poverty gap index and poverty severity index by province, 2011

Province	Percentage of Poor People			Poverty Gap Index (%)			Poverty Severity Index (%)		
	Urban	Rural	Urban+ Rural	Urban	Rural	Urban+ Rural	Urban	Rural	Urban+ Rural
Bali	3.91	4.65	4.20	0.76	0.52	0.66	0.20	0.09	0.16
Nusa Tenggara Barat	23.67	16.90	19.73	4.58	2.80	3.54	1.25	0.71	0.94
Nusa Tenggara Timur	12.50	23.36	21.23	2.27	4.67	4.20	0.65	1.42	1.27
Indonesia	9.23	15.72	12.49	1.52	2.63	2.08	0.39	0.70	0.55

Source: Badan Pusat Statistik, http://www.bps.go.id/eng/tab_sub/view.php?kat=1&tabel=1&daftar=1&id_subyek=23&notab=1. Poverty rate, poverty gap index and poverty severity index are different measures of poverty used by Statistics Indonesian. These are defined in Ravallion (1998).

The three provinces covered by this study are markedly differentiated by their socio-economic status, with more people than the national average who are considered poor in Nusa Tenggara Barat and Nusa Tenggara Timur (Table 2). Bali, together with Jakarta, has the lowest poverty[5] incidence in the country. This is largely due to its tourism sector, as discussed below.

Bali

Bali is an internationally known Indonesian island located about two miles east of Java. It has been described in the west as a "paradise" (Vickers 1989). It is small in comparison to other key islands in Indonesia. It has a total land area of 5,637 km^2 with a population in 2010 of 3,522,375, or 625 people per km^2. In 2011, about 33% of Bali's estimated gross regional development product of 30.8 billion rupiah[6] was accounted by the tourism, hotel and restaurant sector; about 2.5 million visitors directly arrived in Bali in 2010.[7] This is followed by the agriculture, animal husbandry, forestry, and fishery sector with 19%. Despite the predominance of tourism in the provincial economy, the agriculture-related sector provides 31% of total employment for people aged 25 and older, while tourism employs only 26%. Coconut, coffee, cloves, tobacco, cacao, and vanilla are the key agricultural commodities in Bali.

The coastal waters of South Lombok
Photo Credit: Albert Salamanca

In terms of the environment, centuries of agriculture, extensive irrigation networks, and the current pattern of land use have fragmented ecosystems, leaving only patches of forest (Riley and Fuentes 2011). Despite such fragmentation, a verdant scenery and lush countryside exist due to engineered water resource management interventions. The resulting system is known as *subak,* an institutional arrangement which evolved through centuries of trial and error among farmers to distribute and manage water from a common source (see Box 2).

For the scoping assessment at the village level, we visited two villages which are practicing *subak sawah* (mainly rice farming) in Geluntung, Tabanan, and *subak abian* (coconut, coffee and other crops) in Kiadan-Pelaga, North Badung.

[5] Poverty is defined in Indonesia using the concept of basic needs, so that the poor are those who are unable to cover the cost of meeting their basic needs for food and non-food items. A food poverty line of 2,100 kilo calories per day and non-food poverty line based on 51 commodities that 90% of poor people purchase are the bases for the country's poverty threshold, so the poor are those with expenditures below this threshold (see Badan Pusat Statistik, http://www.bps.go.id/eng/menutab.php?tabel=1&kat=1&id_subyek=23).

[6] At constant 2000 prices.

[7] Badan Pusat Statistik, Provinsi Bali, http://bali.bps.go.id./eng/index.php.

Box 2: Subak water management

Subak is a traditional Balinese system of water governance and rice cultivation, predominantly practiced on terraced paddy fields. Encompassing agricultural planning, legal, corporation, and religion (Geertz 1980), this regulatory system understands water as a complex resource that must be managed holistically. Traditionally this was done through a network of "water temples" (most notably the UNESCO World Heritage site of Goa Gajah near Ubud) that were separate from the state and cooperatively managed (Lansing 1987).

Management links irrigation, traditional religion, and social organization. Ceremonies associated with the start of sowing, sprouting of seedlings, and following harvest, involve farmers collectively asking for a fruitful harvest and protection from pests and diseases. The subak produces an "overwhelmingly local and intensely democratic" (Geertz 1980, p.79) form of water control. Each land owner is a citizen of the *subak* and must play a role within the collective upkeep of the agro-community. This includes electing a *subak* head; paying taxes; assisting with the maintenance of waterways; attending meetings; and adhering to the regulations and constitution of the *subak*.

The irrigated rice terraces of Bali have been described as "among the world's most productive agroecosystems" (Lansing and Fox 2011: 927). The spread of *subaks* across Bali's landscape, Lansing and colleagues have hypothesized, was a process of niche construction and an adaptive response to competing demands on water and to the need to control pests. Specifically, the *subak* functioned to enable a "staggered irrigation schedule" that allowed farms at different elevations to share water, harvest their crops at the same time, and let their fields go fallow synchronously, controlling pests (Lansing and Vet 2012).

Without the *subak* structure, the risk of water scarcity increases, and harvests are more likely to fall out of sync, enabling pests to migrate from one field to another. The *subak* sustained Bali's rice farming households for centuries, but was disrupted by modern practices such as the use of fertilizers during the Green Revolution, leading to a state of "almost instantaneous collapse of rice harvest" (Lansing and Fox 2011, p.932). In Tabanan, the government built a *Subak* Museum to highlight the importance of *subak* in the life and culture of Bali, but the future of *subak* and rice farming in general is increasingly threatened by a widespread cultural bias against farming as an occupation (Lorenzen and Lorenzen 2011; MacRae 2011).

Nusa Tenggara Barat

Nusa Tenggara Barat (West Nusa Tenggara) is located in south-central Indonesia. The two largest islands in the province are Lombok in the west and Sumbawa in the east. Mataram, on Lombok, is the capital and largest city of the province. The province is administratively divided into eight regencies/districts (*kabupaten*) and two municipalities (*kotamadya*):

- On Lombok: Mataram (municipality); West Lombok (Lombok Barat); Central Lombok (Lombok Tengah); East Lombok (Lombok Timur); and North Lombok (Lombok Utara).
- On Sumbawa: Bima (municipality); Bima; Dompu; Sumbawa; and West Sumbawa (Sumbawa Barat).[8]

Nusa Tenggara Barat had a population of about 4.5 million in 2010, and a relatively large share of its population is poor. The province's poverty severity index of 0.94 is much higher than the national average of 0.55 (see Table 2).

[8] Badan Pusat Statistik, Nusa Tenggara Barat, http://ntb.bps.go.id/?menu=tampil&idside=29.

As time was limited, activities in Nusa Tenggara Barat were restricted to Lombok, which is home to a large share of the province's population. A roughly circular island, Lombok is about 4,739 km^2 in size (Astawa 2004) and lies around 35 km from Bali; the two islands are separated by the Lombok Strait. Most of the inhabitants of Lombok belong to the ethnic group Sasak.

Wealthy households in Lombok have brick houses, televisions, satellite dishes, electricity and running water, but the poor have no such comforts and live in homes built with non-permanent materials such as bamboo and organic roofing (Prado et al. 2010). Lombok's landscape is dry and dominated by the 3,726 m Mount Rinjani, an active volcano and the third-highest peak in Indonesia (Myers and Bishop 2005).

Several smaller islands called Gili surround Lombok, most notably Gili Air, Gili Meno and Gili Trawangan, to the west. Tourism in the Gili islands has prospered since 2004 (Graci 2010). Gili Trawangan is the most developed and the hub of dive tourism in Lombok. Gili Air is newly developed, while Gili Meno is undeveloped. In Gili Air, tourism is booming, with newly established resorts and restaurants.

Nusa Tenggara Timur

Nusa Tenggara Timur (East Nusa Tenggara) is located in the eastern portion of the Lesser Sunda Islands. The province capital is Kupang, on West Timor. The province consists of about 566 islands, but is dominated by the three main islands of Flores, Sumba, and West Timor. The eastern part of Timor is the independent country of Timor Leste. The total land area is 47,876 km^2. Nusa Tenggara Timur is composed of 20 regencies/districts (kabupaten) and one autonomous city (kupana). As of 2010, it had an estimated population of 4,683,827, and an average population density of 101 persons/km^2.[9]

By several measures, the province's economy is weaker than the Indonesian average, with high inflation (15%), high unemployment (30%) and high interest rates (22-24%). The secondary school enrolment rate of 39% is dramatically below the Indonesian average (80.49% in 2003/04, according to the United Nations Educational, Scientific and Cultural Organization, UNESCO). Lack of clean drinking water, sanitation, and health facilities mean that child malnutrition (32%) and child mortality (71 per 1000) are higher than in most of the rest of Indonesia.

Nusa Tenggara Timur remains one of the poorer Indonesian provinces, with a poverty severity index of 1.27, the fourth-highest in the country (see Table 2); 60.21% of 16- to 18-year-olds are in formal or non-formal education.

Children playing card games in Central Lombok
Photo Credit: Albert Salamanca

Scoping activity for this province was restricted to West Timor. Focus group discussions occurred in Kupang City and various sites in the regency of South Central Timor, which has a relatively mountainous topography, with three primary mountains (Mollo, Kekneno and Mutis). West Timor is considered to have three distinct languages – Dawan, Tetun and Helong (Wurm et al. 1981). However, the island has numerous dialects and a diverse cultural and ethnic history. This can be seen in the naming of places, which is expressed through "the use of allusion, spoken image and the rich repertoire of conventional metaphor" (McWilliam 1997, p.101), linking places back to an ancestral narrative.

[9] Unless otherwise noted, all statistics in this section are from Badan Pusat Statistik, Provinsi Nusa Tenggara Timur, http://ntt.bps.go.id/.

Findings

A. Bali

Provincial level, Kerobokan-Denpasar

The FGD at the provincial level in Bali was organized by Yayasan Wisnu (see Box 1 for the background of this organization). The 19 participants included government officials, a university researcher, NGO activists, and local traditional (*adat*) leaders and community members. The government officials came from the offices of agriculture, forestry, fisheries and marine affairs, and environment. There was a roughly equal representation of men and women.

Rice field in Central Lombok
Photo Credit: Albert Salamanca

Issues with the implementation of RAN-PI - Bali

The RAN-PI was included in Bali's Action Plan (*Rencana Aksi Daerah* or *RAD*) in 2009, partly in response to the 2007 Bali Climate Change Conference and subsequent Bali Road Map. Province officials said they were implementing and integrating various programmes on mitigation and adaptation. These included tree planting, forest rehabilitation, the building of small dams and reservoirs, promoting organic farming, waste management, and coral reef rehabilitation through coral transplantation. However, NGO activists were unconvinced of the impact of these projects. There were also policies that conflict with RAN-PI programmes. For instance, the head of tourism implied that tourism is placing added pressure on the province's water and energy supply.

Most of the participants observed a significant change in the climate. Participants estimated that there was insufficient water coverage for 40% of agricultural land. It was also mentioned that the water level of the Palasari Dam had decreased. Seasons were more uncertain and unpredictable, crop productivity had declined and in some cases failed. Also, unchecked land use was leading to a decline in available arable land.

The focus group discussion suggested that stricter government policies and regulations should be introduced. These should not just "reduce" harmful activities but also prohibit certain actions such as land conversion and the use of plastic bags. It was agreed that sound spatial planning (a master plan) based on the profile, characteristic and carrying capacity of the area should be introduced. Integrated efforts aimed at reforestation and ecosystem rehabilitation are required.

Research priorities identified by participants

Participants stressed the need to prioritize research on water shortages. Participants were keen for this to include the strengthening of traditional water management practices, such as the customary regulation of sacred places (*awig-awig*). This could be achieved through a user-generated inventory of traditional wisdom, myths and practices. By collating this information there would be a recognition, and therefore legitimation, of autonomous adaptations. It would also provide a source of traditional knowledge for future reference.

Capacity needs identified by the participants

Climate change adaptation research and capacity building were not directly discussed; however, both were implied in a discussion on existing traditional wisdom and knowledge. The representatives and leader of the *adat* community and AMAN (see Box 1 for description) were quick to stress the extent to which traditional Balinese wisdom and spiritual lifestyle could complement adaptation. The group believed that if traditional wisdom was observed and followed, both individually and communally, it would reduce the impact of global environmental change.[10]

[10] An example raised was the Balinese Seclusion/Solemn Day (*Hari Raya Nyepi*). This celebration occurs on the eve of the Hindu New Year and is a time of abstention. Celebrators refrain from using fires, electricity, travelling and other consumptive acts. This was considered salient to current environmental concerns and could become a more widely observed celebration.

Gili Air, Indonesia
Photo Credit: Albert Salamanca

Kabupaten level, Tabanan

The Tabanan District is a well-known source of rice and other agricultural products for the province. The FGD of Tabanan *kabupaten* was held at a restaurant in Tabanan City with the help of AMAN Bali and facilitated by its secretariat coordinator. The FGD had 15 participants; composed of government officials, political party cadres, NGO activists and local entrepreneurs. Unfortunately the group contained only two women, one from a local youth group and the other a political party member.

Issues with the implementation of RAN-PI identified by the participants

Most of the government officials were already aware of climate change issues and the RAN-PI and Bali RAD documents. Government officials recognized a number of recent programmes and projects relating to adaptation, mitigation, and anticipating the impacts of climate change. These included replanting, reforestation, and forest rehabilitation on critical lands; household water management through small dams, use of bio-pores, and catchment-wells; integrated waste management including producing manure-fertilizer and biogas from cattle; climate-proof seed selection; promoting organic farming and eco-agro-tourism; and climate change education and community empowerment projects. These RAN-PI and Bali RAD projects are said to have been implemented efficiently and have experienced few complications.

However, younger participants (the political party cadres, NGO activists, and young entrepreneurs promoting organic coffee) painted a different picture. Interviewees complained that there was no encouragement to engage with these projects, and some were unaware that such projects existed. Participants called for better communication between parties, greater integration, and wider involvement. The group expressed the need for a knowledge system that documented both contemporary adaptation projects and traditional practices. There was a belief that Bali could become a "universal library", providing a space for climate change education and the sharing of knowledge that enhances adaptive capacity. The focus group discussion participants were unanimously positive about the potential for a resource that combined mitigation and adaptation with local knowledge.

Research priorities identified by the participants

The focus group at the provincial level agreed that research should prioritize the impacts of climate change. This would allow for better implementation of adaptation and mitigation programmes. It was believed that this would increase the likelihood of the business sector embracing corporate social responsibility programmes.

Capacity needs identified by the participants

All participants stated that they required further capacity-building. Politicians and legislators stressed the need for specialized adaptation knowledge so that they can put in place sound policies and regulations. The Bali focus groups, at both the province and *tabanan* level, were less concerned with climate disaster and disaster risk reduction. This is probably a result of these sites being less exposed to coastal hazards.

Village level, Subak Sawah community of Geluntung, Marga, Tabanan[11]

The village is a charming banjar (traditional village), actively preserving the community's cultural heritage, at the foot of Batukaru mountain, one hour north of Denpasar; the surroundings are lush and green. All 14 participants were men, ranging between 50 and 70 years of age. The group was made up of farmers, village governors, and adat caretakers (*kelianbanjar*).

Issues with the implementation of RAN-PI

Participants were not aware of the concept of climate change and the RAN-PI document; nor had they noticed any extreme changes in daily weather. However, they were intrigued. A participant representing *kelianbanjar* quizzed the interviewer: "What is climate change?" "What is the main cause?" "If it creates extreme weather, how long will this last?" Once the consequences of climate change were explained, a second round of questions ensued: "How can we anticipate it?" "How can we cope with uncontrolled climate in our daily lives in the countryside?" "Can the Balinese peaceful concept of *Tri Hita Karana* (to respect God, respect nature/universe, and respect fellow creatures) halt climate change?" "What is the contribution and role of so many institutions and organizations in addressing this issue?" and "What is the government response at the national, regional and global level?"

Farmers in Geluntung were more concerned with the daily agricultural problems caused by agro-chemical inputs. During the Green Revolution, the government implemented a number of new agricultural procedures and technologies. The use of modern pesticides led to the intrusion of unknown pests, pollution and decreased production. Focus group members were aware of the relationship between previous government policies and the resulting ecological damage. The group had become wary of development projects and sensitive to the long-term damage they could inflict. As well as agricultural damage, the village had experienced water and energy crises caused by external forces. Participants thought the current development path seemed greedy and expensive and reminded the interviewer of the Balinese concept of *Tri Hita Karana* that stresses the need for a harmonious triadic relationship between human society, the spirit realm, and the Universe. It was believed that if *Tri Hita Karana* had been followed Bali would not have seen its carrying capacity reduced. The village is now making an effort to revert back to organic inputs in their farms.

Research priorities identified by the participants

As the farming community in this village is reverting to natural, organic farming practices, the group desired the integrated management of farms over a short time frame (see Box 3 for a perspective from a local champion). Farmers desired knowledge and methods on how to reduce dependency on agro-chemical inputs, while maintaining satisfactory yield.

Box 3: The voice of a 'local champion'

> One participant, who modeled himself as a local activist, inventor and innovator, has put in place a number of organic lifestyle ventures. The interviewee is managing and treating plastic waste to create oil, and is producing biogas from cattle manure. The resulting products are then used for electricity and cooking in the home. This done under the banner, "cow shit is not bull shit". From his house, he also runs a community radio station. He is a humble activist, campaigning against an encroaching consumer lifestyle and profit-oriented economy, without disrupting the village community. We identified him as a "local champion"; a linchpin who will prove central to the village successfully adapting to climate change and its impacts. As an individual, his enthusiasm and innovation has the potential to enhance the collective adaptation capacity, of the community and build resilience.

[11] This FGD was held at the *subak* village of Geluntung-Kaja in Tabanan District. It was held in the village's meeting facility on 27 September 2011, and facilitated by I Made Nurbawa from AMAN Bali.

Capacity needs identified by the participants

The farming community in Geluntung and surrounding agricultural villages required education and training in permaculture and organic farming techniques. IDEP Foundation, an NGO in the neighbouring district of Geluntung which specializes in permaculture and disaster management training and programmes, provides a permaculture training programme and demonstration.

Village level, Subak Abian community of Kiadan-Pelaga, Badung Utara[12]

Subak Abian is the *subak* management system applied to the dry/upland farming of coconut, coffee, cacao, cloves, banana or mixed plantation. In Kiadan-Pelaga, rice is still grown during the wet season, while a variety of upland crops are grown during the dry season. Since 1983, some rice fields have been permanently turned over to Arabica coffee production, making coffee a major source of income for farmers.

All participants were male members[13] of the *Subak Abian* Sariboga, ranging in age from 30 to 50 years old. The FGD told us that *Subak Abian* Sariboga was officially recognized by the government in 1987 and includes both men and women members.

Central Lombok
Photo Credit: Albert Salamanca

Issues with the implementation of RAN-PI

The group had been informed neither about climate change nor the RAN-PI document; however, most of the farmers had noticed changes in the weather and seasons during the past few years. Participants noted more intense and longer periods of rainfall. This caused coffee flowers to fall before the berries had formed. During the dry season, droughts were hotter and lengthier, killing grass required for cattle feed. Humans, animals and plants were reported to be more sensitive to pests and disease. Signs that could previously be relied on to predict weather and the change of seasons were regularly failing. Overall, production and income were reported to be declining. Life had become harder and more uncertain.

In response to these changes farmers have received government advice on better sowing techniques, plant growth and nurturing, and the possibility of switching to other crop types (for example, mahogany or albizia). Government officials have also encouraged farmers to shift to organic farming, especially for coffee, and integrate pest management. The village continues to perform traditional rituals.

An alternative income is provided in the form of eco-agro-tourism, with participants providing home-stays for tourists (mostly foreign students) who want to learn about Subak Abian and Balinese village life. The FGD were encouraged by this new venture, seeing it as an alternative income stream while waiting for the harvesting of crops. Unlike the mass-market, high-density, tourist developments in southern Bali, eco-agro-tourism provides an environmentally and culturally sensitive form of tourism. The discussion ended with an expectation from farmers that they would receive further education on climate change and global warming, and how to adapt to its impacts.

Research priorities identified by the participants

Being both dedicated to and proud of their coffee plantations, the coffee farmers were keen to learn more about the impacts of uncertain climatic change and how they could adapt to these changes. Although equipped with the tools to navigate gradual changes, farmers were aware that they would have trouble responding to sudden and unpredictable changes.

Capacity needs identified by the participants

Focus group members wanted to improve their capacity to engage in eco-agro-tourism. This requires the preparation of decent home-stays, foreign language learning, and the creation of a network for promotion and marketing.

[12] The discussion was held in Kiadan-Pelaga village in the Badung Utara kabupaten, on 24 September 2011, in a meeting facility owned by the Subak Abian Sariboga. The meeting was organized by Yayasan Wisnu Foundation and facilitated by the organization's director, I Made Suarnatha. Yayasan Wisnu Foundation has helped the local community develop eco-agro-tourism as an alternative livelihood.

[13] During the meeting, the women prepared snacks and dinner for the participants and Yayasan Wisnu Foundation staff.

Photo Credit: Albert Salamanca

B. Nusa Tenggara Barat

Provincial level, Mataram[14]

Mataram is the capital of Nusa Tenggara Barat; located in the southwest of Lombok Island, it faces the Lombok Strait. The water supply in Lombok overall is stressed, and so is the supply for Mataram. The highlands in the surrounding area are forested and mostly undeveloped, while the lowlands are highly cultivated. The southern part of the island is fertile but drier, especially toward the southern coastline.

The focus group included 17 people: representatives from local NGOs and provincial government offices (development planning, mining, marine and fisheries, environment, forestry, and agriculture). In addition, there was a journalist, a scientist and the headmaster of an Islamic boarding school. Men dominated the group, with only one female activist in attendance. Their ages ranged from 30 to 55.

Issues with the implementation of RAN-PI

The provincial government of Nusa Tenggara Barat had been drafting its Local Action Plan for the RAN-PI, but it had not yet been officially endorsed. It was said that the primary constraint to endorsement was the absence of any legal measures from the national or central government. The legal basis could be a national law addressing climate change, from which local regulations could be derived. The group stressed that enabling national legislation must be passed before offices can allocate national funds to local governments.

Still, most of the government officials said their offices had implemented actions concerning climate change, with some programmes or projects already part of their mandates. For instance, the Office of Forestry has launched a forest rehabilitation and replanting programme that could be considered both a mitigation and adaptation strategy; trees are not only intended for carbon sequestration, but also to hold water and cool down the ambient temperature. Likewise, the Office of Agriculture has been using new technologies to develop different crop varieties, in anticipation of yield reductions due to climate change. The Office of Environment reported promoting climate change issues and mainstreaming it into its middle-term (five-year) development planning for the province. Some NGO activists stated that they were executing programmes related to climate change regardless of the RAN-PI.

Some critical NGO activists reminded the focus group that drafting the RAN-PI would not necessarily lead to the mainstreaming of climate change into development planning, as active implementation of its objectives is required. The group members were aware that some current regulations conflict with the ideals of RAN-PI and are not sensitive to climate change impact or disaster risks. There remains little vertical communication, leaving lower administrative levels and communities unaware of climate change risks. For instance, the group complained that there is no extreme weather event early warning system for farmers or fishermen. A mechanism for the distribution of such information across the province would allow farmers and fishermen to take necessary precautions. It was suggested that the government should implement strategies for building people's resilience and preparedness. Closer communication between academics, scientists and local communities should also be established; this would encourage the development of appropriate technologies and knowledge for adaptation to climate change.

Research priorities identified by the participants

Participants expressed a need for more applicable and practical research data, for the development of both new crop types and new farming patterns. This should be carried out alongside the renewal of local knowledge and traditional wisdom. For example, traditional barn systems could be used to preserve a variety of seeds, securing future genetic biodiversity.

[14] The FGD in Mataram was carried out on 12 September 2011 and was the first at the provincial level. It was organized by Santiri and held at their collective office. Tjatur Kukuh, the director of Santiri, facilitated the meeting.

Capacity needs identified by the participants

To increase people's awareness of climate change impacts and improve disaster risk reduction, the national government had built a number of field-schools on climate change *(Sekolah Lapang Iklim).* For a small volcanic island like Lombok this is especially crucial; however, this should be extended across other remote islands in the archipelago. Field-schools were seen as providing a suitable space for the education of the public, the creation of public awareness campaigns, and the dissemination of recent research on the vulnerability of small islands in Nusa Tenggara Barat.

Kabupaten level, Gondang, North Lombok

Gondang is a small town and the recently established capital of the *kabupaten.* It is about a one-hour drive from Mataram. It is located about 4 km inland from the northeastern coast of Lombok, at the foot of Mount Rinjani. North Lombok has a varied topography, with the steep slopes of Mount Rinjani, prominent coastal cliffs, lowlands and beaches.

This focus group discussion involved 15 participants, all male; there was an equal representation of officials from the local administrative offices of North Lombok and from local NGOs (*Lembaga Musyawarah Nelayan Lombok Utara,* LMNLU, and its cooperatives). The government officials were from the offices for marine affairs and fisheries, forestry, agriculture, environment, budgeting, and disaster risk management. Their ages ranged from 30 to 50.

A community meeting in Central Lombok
Photo Credit: Albert Salamanca

Issues with the implementation of RAN-PI

When asked about RAN-PI, only three of the 15 focus group participants were aware of the document, and only one had read the report. An NGO activist reported that at the *Bupati* (head of *kabupaten*) office, the issue of climate change had been mainstreamed into the five-year development plan (*Rencana Pembangunan Jangka Menengah Daerah/RPJMD*), but had not yet been integrated into an annual framework. Discussion was centred on problems at the *kabupaten* level, such as illegal logging, landslides, illegal fishing, and water crises, and some solutions to these problems. Some environmental projects were already in place, such as coral transplantation. Coral transplantation had a two-fold objective: to rehabilitate destroyed coral reefs and to absorb carbon to produce offsets for international markets. The participants stated that to adapt to future water pressures, new catchment wells or ponds (*embung*) had been dug and trees had been replanted around the wellspring.

Research priorities identified by the participants

Government officials complained that insufficient funds were limiting their research scope. While NGO activists were able to carry out a significant number of assessments and studies through support from international NGOs (Oxfam was given as an example), government officials found it difficult to access funds. The focus group listed a number of projects being carried out, including: an inventory of the most vulnerable coastal areas, a study on women's adaptation to climate change, and the identification of local adaptation strategies. The group members believed there remained a need for research on the diversification of seeds and crops to assure food security. It was suggested that seed money could be obtained to implement adaptation projects.

Capacity needs identified by the participants

Government officials asked for training on climate change issues in order to increase their understanding of both the science and implementation of RAN-PI and other central government policies and regulations. Capacity-building for legislators is especially important for the appropriate policies to be formulated and implemented.

[15] The FGD at the *Kabupaten* scale was held in Gondang, the capital of *Kabupaten* Lombok Utara, on 13 September 2011. It was held at the *Kabupaten's* meeting facility and organized by Santiri and the *Lembaga Masyarakat Nelayan Lombok Utara (LMNLU)* or Fishers' Council of Northern Lombok, the meeting was again facilitated by Tjatur Kukuh.

Box 4: The voice of a 'local champion'

An interview with a staff member of Koslata, a local NGO based in Mataram and North Lombok, suggests that NGO activists are more knowledgeable and skilled in development, humanitarian, and environmental issues than government officials. This has made government officials dependent upon NGOs, regularly following the projects and practices that NGOs have initiated.

A previous participatory research project on adaptation and disaster risk reduction revealed that the community is aware and concerned about climate change and believes it affects everyday life and poses a danger to future survival. The NGO staff member also noted that climate is a gendered issue: women are the main providers in the households, and so they would bear the heavier burden. However, their voices are rarely heard and their participation is low in the planning and decision-making process. The group agreed that affirmative action was needed to ensure the sufficient representation of women.

The NGO staff member also argued that decision-making should be done through a bottom-up approach. It was noted that, even at the village level, action plans cannot be generalized. Different consultations with local stakeholders need to be conducted in each eco-zone of the village for better planning, implementation, and eventually, results.

Village level, small island community of Gili Air, Northwest Lombok[16]

Gili Air is the easternmost islet of a three-islet archipelago off the northwestern coast of Lombok. Gili Trawangan and Gili Meno make up the rest of the archipelago. The islet is under the jurisdiction of North Lombok District. All three islets are surrounded by extensive coral reefs. The size of the islet is 180 hectares, with a 5 km coastline and a population of about 1,500. Apart from a few brackish wells at the centre of the island, there are no freshwater sources. The islet's beaches have been developed with tourist villas and bungalows, cafés, restaurants, and souvenir shops. Inland settlements cater less to tourists, with only a number of home-stays. The focus group discussed that development of marine tourism began in Gili Trawangan about 30 years ago, starting with modest home-stays owned by locals. Now the island caters to a range of budgets, with villas and bungalows fully equipped with modern amenities. The island has also capitalized on its excellent diving, with specialist dive facilities such as deep swimming pools. These developments are predominantly run by outside investors or expatriates.

The discussion included 13 participants. All were young men (around 20 years old); most worked in the tourism sector (in villas or restaurants, as boatmen, entrepreneurs, labourers). There was also one junior-high school student (13 years old).

Issues with the implementation of RAN-PI

None of the participants, including the head of the village, had heard of the RAN-PI. The group's climate change knowledge was limited, with the student – who had done a project on climate change at school – the most knowledgeable.

The environmental problems participants were most concerned about included beach erosion, higher temperatures, and a worsening water crisis that was causing crop failures and lack of food for the livestock. The boatmen were worried by extreme weather, coral bleaching and decreased fish stocks. *LMNLU* has established *awig-awig* (customary local law) to prevent blast fishing and the use of poisons, and had introduced a fishing zoning system. These traditional measures were reinforced by two formal laws (The Fisheries Law No. 9/1985, and the Environmental Law No. 23/1997) (Ruddle and Satria 2010, p.38). Nevertheless, the fishing season was reported to have been reduced to only three months. While reduced fishing stocks were seen to present a significant danger to livelihoods, it was also assumed that the tourism business would provide a resilient alternative income.

[16] The focus group discussion in Gili Air was the first at the village level. It was held on 10 September 2011, in the living area of a modest cottage. The meeting was facilitated by a local activist called Wahyudin, who works for *Jaring Pela* (an Indonesian NGO and network specializing in marine and coastal issues), and his friend, Awaluddin, a local of Gili Air.

Tourist boats at Gili Air
Photo Credit: Albert Salamanca

Group members also said that the relationship between tourism and traditional livelihoods was not always harmonious. For example, locals had to compete for freshwater with the tourism sector, and diving and snorkelling operators were unhappy with fishermen working near dive groups. However, there was a sense that the island could resolve conflicts if all appreciated that the resources were shared and must be collectively managed. The participants gave the example of fishing rights being decided through a first-come, first-served policy and a collective beach clean-up every three months.

Research priorities identified by the participants

The group identified technology for obtaining freshwater, and a more effective and sustainable coral transplantation programme, as the most pressing research objectives.

Capacity needs identified by the participants

Almost all of the participants, especially the student, asked for training on climate change issues and the conservation of their coastal and coral reef ecosystem. The student expected there would be extra-curricular classes on climate change and environmental issues. People welcomed the idea of further marine protected areas around their island.

Village level, fishing community of Jambianom, North Lombok[17]

Jambianom is a simple village located on a white-sand bay on the northern coast of Lombok. The village has a population of about 500. Most households rely on fishing. The bay has a famous coral garden that has been artificially extended through a transplantation programme started in April 2007 by Bahari Lestari, a local organization.

The focus group had 13 participants; predominantly fishermen, but also included two housewives, a female 11th grade student, and a member of *Perempuan Bahari* (a local women's group).

Issues with the implementation of RAN-PI

None of the participants had heard of the RAN-PI, but most were familiar with the issue of climate change. They had perceived numerous climate change impacts, including unpredictable and extreme weather, stronger waves, drastic change in sea-water temperature, coral bleaching, extreme high-tides, and coastal abrasion. They also reported behavioural changes of some marine biota; edible snails and sea urchins were becoming less numerous and smaller in size. Fishermen and women complained about how these changes affected their livelihoods, forcing them to borrow money from a "legal-formal" loan-shark, and falling into deeper debt.

In the past, some fishermen had practiced blast fishing and destroyed coral reefs. In 2007, with the help of outsiders, some fishermen started to put effort into the restoration of reefs, using various coral transplantation techniques, such as bio-rock systems and iron racks. The fishermen hoped this endeavour would bring reef fish back and attract tourists. The group also mentioned the establishment of local regulations (*Awig-awig*) to ban destructive fishing practices. These measures were relatively successful; however, coral bleaching was seen to remain a problem.

[17] The focus group discussion was held on 13 September 2011. The meeting took place at a modest open meeting place, and the meeting was again organized by Wahyudin, and facilitated by Tjatur Kukuh.

A tourist souvenir maker in Gili Air
Photo Credit: Albert Salamanca

Research priorities identified by the participants

The coral reef is relied on by both the tourism and fishing sectors. The reef also serves as a coastal barrier, reducing erosion. The group unanimously agreed that the protection of the coral reefs was the most pressing concern. The group decided this required further, site-specific, research into coral transplantation and the education of locals in transplantation methods.

Capacity needs identified by the participants

The group identified the need to enhance capacity to better manage coastal resources and anticipate climate change impacts. Group members were also keen to develop alternative incomes; possibly through improving their handicraft skills. They also stated the need for training on better fishing methods and the provision of fishing technology that can be used during extreme weather. The development of aquaculture could also provide a more stable income.

Village level, community forestry of Suela, East Lombok[18]

Suela is a village in East Lombok District, on the eastern flank of Mount Rinjani. The rainfall here is higher than in the south of the island, and the rivers that flow down the mountains have a wide catchment area. The region is predominantly agrarian, with rice, copra, cassava, tobacco and timber production. During the discussion it was mentioned that the region's decreasing forest cover was leading to land degradation and a decrease in the water table.

The focus group included 14 participants, dominated by men (there was only one woman) from various occupations (teacher, farmer, forest-farmer, student, and local NGO activist). Their ages ranged from 20 to 40.

Issues with the implementation of RAN-PI

It seemed that the implementation of RAN-PI had gone no further than the drafting of the Local Action Plan by the province office. Programmes had little substance, with participants complaining of no action behind climate change campaign slogans. Teachers and students were aware of climate change, but not farmers. The group was interested in talking about climate change issues. Some of the impacts they had experienced included extended drought, unpredictable seasons and weather events, unknown new pests, and crop failure. This in turn had put pressure on traditional livelihoods, increased burdens on housewives, and forced the village youth to seek jobs as labourers away from the village.

Firewood is required to fuel the smokehouses of tobacco plantations. Previously, the national government had provided kerosene subsidies. However, following the removal of state subsidies, farmers have returned to collecting firewood from the surrounding forest. This increased deforestation was identified by the focus group as the cause of recent land degradation. On top of this, farmers admitted to resorting to illegal logging after successive crop failures, further encroaching on protected forest. The activists also pointed out weak law enforcement and coordination in combating illegal logging. Some effort and research has been done, such as a joint Indonesian and South Korean government afforestation and reforestation project. Initiated by NGOs and practitioners, these projects were considered insufficient in scope and application.

[18] This discussion was held on 30 September 2011. Gema Alam, a local NGO, helped organize the meeting at the house of a Gema Alam activist; the facilitator was Tjatur Kukuh.

Research priorities identified by the participants

The village has a history of community forestry, and the focus group expressed an interest in estimating the extent to which illegal logging had contributed to global warming. It was suggested by local actors that quantifying the damage that logging had caused would provide the community with the means to lobby government institutions. Data would empower the community, leading to investment in local research, and revitalize traditional wisdom.

Capacity needs identified by the participants

Participants, especially the teachers, were interested in public education on climate change. It was suggested that climate change should become a regular subject for teaching, and each school might recruit a "climate ambassador" as campaigner and coordinator of regular discussions on the subject. It was agreed that the first step should be to develop a media campaign and kits for students, farmers and women's groups, and the public.

Village level, upland agricultural *adat* community of Sembalun, East Lombok[19]

Sembalun lies in an upland valley on the east side of Mount Rinjani. It is within the district of East Lombok and located on one of the principal footpaths to the mountain peak. The volcanic soil is fertile and rich, and the rainfall high. The area's geothermal potential could meet Lombok's energy needs (Sundhoro et al. 2000). Crops include garlic, chilli, tomatoes, potatoes, strawberries, oranges, avocados and coffee, which are sold on Lombok and shipped to other islands.

All 11 participants were male, between the ages of 26 and 62. The elders were farmers, while the younger ones were student -activists, trainees of *Pondok Pesantren Pertanian,* and guides for an alternative tourism venture run by A.R. Sembahulun, the *adat* and village leader. The community here follows the unique North Lombok religion of *Wetu Telu,* combining both Islam and animism.

Inner Gili Air
Photo Credit: Albert Salamanca

Issues with the implementation of RAN-PI

As in other villages, focus group members had never heard of the RAN-PI. However, they observed that climate and weather patterns had noticeably changed since 1998. The farmers felt confused and uncertain about these changes, aware that this was leading to changes to their farming system. Previously, organic farming had been practiced for local crops, such as garlic, potatoes, coffee and oranges. In fact, the village supplied organic garlic to large hotels in Bali. The fertile soil and abundant water supply allowed crops to be grown for longer periods, and shipped to surrounding islands such as Bali, Java and Sumbawa. This had enabled farmers to command higher prices for their crops. However, recently weather variability had forced farmers to employ agro-chemical inputs to boost plant growth, and the previously extended growing season was changing. Extreme weather was disrupting the export process. Typhoons regularly made it impossible to ship crops to other islands, leaving crops to spoil.

Aware that agro-chemical inputs were "poisoning" the soil, A.R. Sembahulun established an Islamic farming training centre (*Pondok Pesantren Pertanian*), dedicated to organic farming techniques. This aimed to lead a "back-to-nature" agricultural movement in the village and explore the usefulness of traditional farming knowledge. Sembahulun has also built a number of simple cottages imitating traditional Sembalun houses, with the aim of encouraging cultural tourism and providing alternative employment for local youth. Further, realizing there were water disputes between farmers from neighbouring districts, Sembahulun has made a concerted effort to protect water resources in the village. This has included replanting trees surrounding wells, using his rice fields as barter for the security of springs, and lobbying local government to provide legal protection for local springs – free from private ownership and owned by the *adat* community. As in Geluntung, Sembahulun can be seen as a "local champion", whose enthusiasm and innovation should be supported as part of local-level climate change mitigation and adaptation.

[19] The discussion was held on 30 September 2011 at the property of A. R. Sembahulun, the *adat* leader and school-master of an Islamic farming training centre (*Pondok Pesantren Pertanian*), and facilitated by Tjatur Kukuh.

Research priorities identified by the participants

To encourage the "back-to-nature" movement, the focus group asked for research on crop diversification using an integrated organic farming system. However, participants also stressed the need to preserve endemic/indigenous species. They also expressed the need for some techniques to clean up agro-chemical residues from the soil.

Capacity needs identified by the participants

To promote alternative cultural tourism (*Pariwisata Alternatif Sembalun*), the group asked for help in marketing their facility. The group identified the tourism and organic farming sectors as working in tandem, complementing each other, and providing a sustainable mode of adaptation to climate change. For this, they needed a capacity-building programme that empowers the community, advances *adat* community practice, and improves knowledge related to climate change.

Village level, coastal *adat* community of Karang Bajo, Bayan, North Lombok[20]

Karang Bajo lies on a hillside on the eastern coast of North Lombok. It is under the administration of the Bayan sub-district. The area is generally dry. However, in areas where there is a reliable water source, such as along the river, crops such as cashew nut, maize and rice are grown.

The focus group included 21 people, mostly farmers from the *adat* (traditional) community with customary positions and roles. There were three *adat* women representatives, aged 35, 19 and 18 years old; the official head of village, and a journalist. The *adat* chief (50 years old) was also a teacher and school inspector; the remaining participants were *adat* members aged between 23 and 75. As in Sembalun, this community also followed the *Wetu Telu* religion.

Issues with the implementation of RAN-PI

Although participants had never heard of the RAN-PI document, they were familiar with the wider issues of climate change and disaster risk management. Karang Bajo has experienced fairly extensive interaction with NGOs and researchers, possibly because of its proximity to the active volcano of Rinjani, where issues of disaster risk are prominent, or because of its traditional *adat* community. This has made the village more informed than comparable villages on Lombok. The earthquake-proof community centre is emblematic of local people's understanding of wider processes and their effects on village life.

Like other local and traditional communities, farmers here also encountered the same phenomena of unpredictable weather, water scarcity, unknown new pests, and crop failure. As an *adat* community, they were attuned to natural signs and processes. Although changes did not always make sense, participants said ancient wisdom agreed with some of the recent observed changes. Traditional wisdom and beliefs remained revered; when asked what their response to Rinjani eruption would be, participants replied: "No, it would not happen. If it really happened, we just yield to God's will." The *adat* chief proudly added that during recent food scarcity following crops failures, they survived through a traditional food security measure called *"gelen"* or *"mundutan"*, allowing villagers to keep their dignity, sovereignty and self-sufficiency.

The group admitted that natural signs were not as reliable now due to variable, unpredictable weather patterns. The group saw the further study of ancestors' knowledge as the best way to comprehend these changes. It was clear that the group did not want their ancestral wisdom to be lost, although it could no longer be relied on to predict seasonal changes. On the other hand, members also wished to further their climate change knowledge and understand its local implications.

[20] The final focus group discussion was held on 1 October 2011 and again facilitated by Tjatur Kukuh. The meeting took place at the village's newly built quake-proof community centre. The centre is currently used as a training and learning facility. There are hopes to build a community library with material on local *adat* knowledge and traditional wisdom.

Research priorities identified by the participants

The group was excited by the possibility of research on the application of traditional wisdom to climate change adaptation. Adaptation strategies could be mainstreamed into a collection of traditional knowledge. It was stressed that knowledge should be systematically documented and stored in an accessible manner so that further generations could learn from them.

Capacity needs identified by the participants

Participants wanted the community centre to become a regional hub for community learning, offering its use to concerned partners from various institutions. The centre should become a place for regular training, discussion, exchange, and dialogues, where community members could learn and enhance their capacity and knowledge. It was recognized that the village will require mentors on certain topics, such as adaptation and disaster risk reduction, and certain practical skills, such as alternative farming on dry land.

C. Nusa Tenggara Timur

Provincial level, Kupang[21]

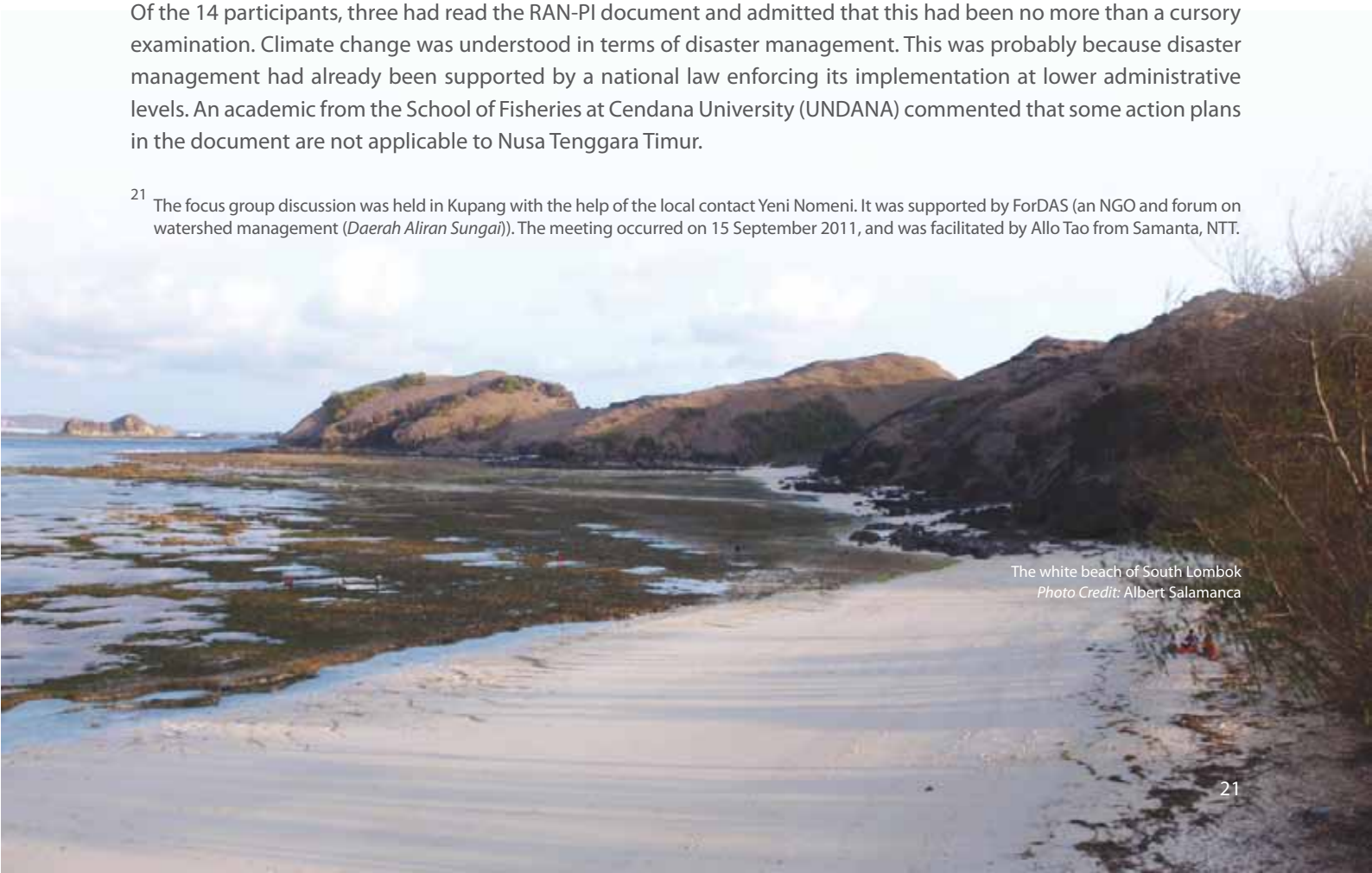
Kupang municipality is the provincial capital of Nusa Tenggara Timur. Located on the southern coast of West Timor, facing the Savu Sea, it sits on the tip of Kupang Bay. The city is spread over a hilly and rocky landscape. The climate is arid compared with the rest of Indonesia. The dryness of the area is exacerbated by the slash-and-burn farming method used by local farmers.

The focus group included 13 men and one woman from a university. The men held positions in governmental offices or were consultants, academics, or local NGO workers.

Issues with the implementation of RAN-PI

Of the 14 participants, three had read the RAN-PI document and admitted that this had been no more than a cursory examination. Climate change was understood in terms of disaster management. This was probably because disaster management had already been supported by a national law enforcing its implementation at lower administrative levels. An academic from the School of Fisheries at Cendana University (UNDANA) commented that some action plans in the document are not applicable to Nusa Tenggara Timur.

[21] The focus group discussion was held in Kupang with the help of the local contact Yeni Nomeni. It was supported by ForDAS (an NGO and forum on watershed management (*Daerah Aliran Sungai*)). The meeting occurred on 15 September 2011, and was facilitated by Allo Tao from Samanta, NTT.



The white beach of South Lombok
Photo Credit: Albert Salamanca

The RAN-PI was considered out of date and prescriptive, making it difficult to adapt to individual circumstances on the ground. The group was hesitant to adopt or implement the 2007 document until it was thoroughly reviewed and revised.

Local government departments were waiting for a national law supporting RAN-PI. This would provide a legal foundation for political action. It was stressed that this would facilitate the adoption of RAN-PI at the local level and allow for the allocation of local government budgets for adaptation. It was stressed that regulations must be issued by the Minister of Home Affairs. This is because the apparatus of local government, from the heads of provinces (governors) to community leaders, is structured in such a way that actors only listen and comply with the minister's decrees. Others also added that in terms of national action plans and policies, Nusa Tenggara Timur remained a province that was out of sight, left behind, and forgotten. Hence, they emphasized the importance of an integrative and coordinating mechanism from the central government down to the marginal, regional, and local levels.

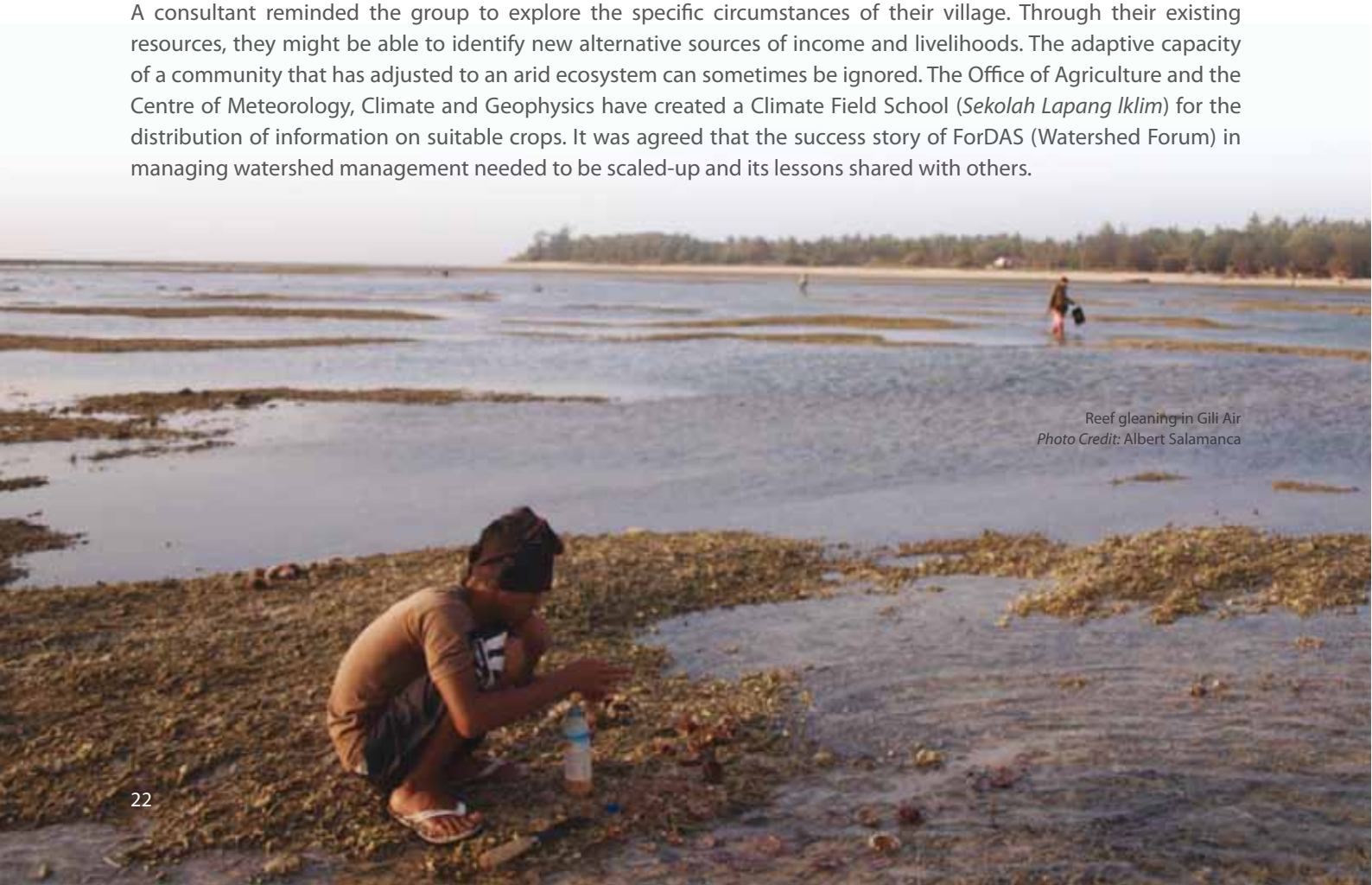
Regardless of the RAN-PI document, some local government offices had been doing work that can be seen as climate change mitigation and adaptation. For instance, regular programmes by the Office of Forestry included replanting, forest rehabilitation and community forestry; the Office of Environment worked on habitat recovery; and the Office of Fisheries coordinated mangrove replanting, coral transplantation, the zoning of marine protected areas, and workshops on sustainable fisheries. The focus group also said some programmes incorporated disaster risk reduction. The group was keen to stress that this involved multi-stakeholders and parties at all levels. The focus group pointed out that adaptation and mitigation efforts may be occurring without being officially recognized. It was mentioned that if these projects were started from scratch, they would require extensive capacity-building, empowerment, databases and financial support.

Research priorities identified by the participants

Taking into account the dry and arid climate of most of Nusa Tenggara Timur, research should be aimed at the development of varieties of crops that are resilient to high temperatures and dry conditions. Appropriate technologies that could secure water resources for irrigation and household requirements were also seen to be important.

Capacity needs identified by the participants

A consultant reminded the group to explore the specific circumstances of their village. Through their existing resources, they might be able to identify new alternative sources of income and livelihoods. The adaptive capacity of a community that has adjusted to an arid ecosystem can sometimes be ignored. The Office of Agriculture and the Centre of Meteorology, Climate and Geophysics have created a Climate Field School (*Sekolah Lapang Iklim*) for the distribution of information on suitable crops. It was agreed that the success story of ForDAS (Watershed Forum) in managing watershed management needed to be scaled-up and its lessons shared with others.



Reef gleaning in Gili Air
Photo Credit: Albert Salamanca

Kabupaten level, South Central Timor[22]

South Central Timor has various ecosystems and habitats, ranging from mountains, highlands and large watersheds, to lowland agriculture and rocky coastal areas. The lowlands produce rice. Soe is located in the semi-arid highlands. During the wet season, Soe is greener and suitable for a variety of crops. However, when the study team visited in mid-September, it looked withered and parched after a long drought. The area is known to be prone to landslides.

Seven men and three women attended the focus group discussion. The participants came from local governmental offices and local NGOs. They were all members of ForDAS of South Central Timor kabupaten.

Issues with the implementation of RAN-PI

Although the group had not heard of RAN-PI, an officer from the Local Body of Disaster Management (*Badan Penanggulangan Bencana Daerah/BPBD*) reported that they had already adopted a Local Action Plan on disaster risk reduction and incorporated some climate change content. It was observed that climate change had impacted the region over the past few years. The weather was extreme and unpredictable, making it difficult for farmers and fishermen to rely on nature to guide their production. As a result, group members reported that crop failure and food insecurity were prevalent throughout the district. In addition, a landslide had recently occurred, killing three villagers. It was felt that these environmental pressures were leading to local resentment, community conflict, apathy, and selfishness. The BPBD had already asked for help and food assistance for the province, but bureaucracy has hampered relief efforts.

The Officer of Fisheries reported coral bleaching and declining fish stocks. This had led to some fishermen migrating out of the region, while others continued to fish part-time and attempted to supplement their income through other channels. It was said that fishermen were desperate for an alternative income source and livelihood. However, the government had asked communities to become more self-reliant. Fortunately, there were many international and national NGOs working in the region, providing assistance and empowering local communities. However, if these institutions are to provide effective relief they must coordinate, collaborate, and cooperate – both among themselves and with their government counterparts.

The Office of Forestry reported some forest rehabilitation and replanting programmes as part of the Indonesian Forest Rehabilitation Programme (*Gerakan Rehabilitasi Nasional/GERHAN*). This had involved using multi-purpose tree species orientated towards conservation and food security. A focus group participant representing the department reported efforts to regenerate degraded forests and create more wellsprings in reforested areas. At this level, the obstacles were limited capital and the slow disbursement of funds from higher administrative levels. It was reported that in the agricultural sector, women's groups were active in promoting organic farming. Women were involved in the growing of seedlings. At first internal resources funded this; however, recently government funds were provided for seeds, water pumps and the digging of small water reservoirs.

The local host, a member of South Central Timor ForDAS, brought up the issue of low capacity among ForDAS members. He stated that colleagues were unable to help communities in the optimal management of their watersheds, especially when dealing with adaptation and disaster risk reduction. He was also concerned about the disappearance of "*rumah bulat*" (a round-shape traditional barn), which had previously functioned as a seed and food storage facility. In the mountainous area where it is very cold at night, family members would stay in *rumah bulat*, its enclosed space proving easy to warm. Although smoky and unhealthy (Kambaru Windi and Whittaker 2012), this tradition helped to preserve crops (mostly maize) for a longer time. The senior female household member, who would coordinate the grain storage alongside food preparation, traditionally did this. However, the focus group reported that the government had recently asked villagers to move out of *rumah bulat* and stay in more ventilated houses. As a result, many *rumah bulat* have been abandoned and are now in a state of disrepair. How can traditional wisdom be combined with modern knowledge to improve both? Advancing adaptive capacity could both improve people's health and use local knowledge to improve the storage of crops.

[22] This focus group discussion was held in Soe, the capital of the district of South Central Timor (*Timor Tengah Selatan, TTS*), hosted by ForDAS on 16 September 2011, and was also facilitated by Allo Tao.

It was raised in the discussion that a study of South Central Timor soil profiles and the species of crops suitable to the land had recently been completed. When discussing this research, the group were worried that recent changes in climate made the research unreliable. How could the government and the science community help? The group agreed that future research should take a bottom-up approach, be sensitive to traditional knowledge and wisdom, and look for local-level solutions to inform the policy-making process. It was suggested that this should not be just the job of the government and scientists, but that it should also be supported by local reports of changes to the environment.

Research priorities identified by the participants

Participants stated that they needed additional studies on the suitability of new varieties of crops in relation to local conditions. This should incorporate the adaptive capacity of traditional knowledge.

Capacity needs identified by the participants

Faced with unpredictable future weather and climate change, the group appreciated the need to build capacity and create a coherent climate change strategy. This included preserving local seeds and improving water resource management.

A farmer crossing a dry paddy in Central Lombok
Photo Credit: Albert Salamanca

Village level, upland agricultural *adat* community of Lelobatan, Mount Mutis, Mollo Utara

This village was located in the sub-district of Mollo Utara on the hillside of Mount Mutis. The trip to Lelobatan was organized and facilitated by a local leader, Mama Aleta Baun, who acted as a link between communities throughout South Central Timor.

The terrain was hilly, rough and very dry. Mount Mutis is the highest point on Timor, at about 2427 m above sea level. It has marble reserves that were mined until the end of the last decade. While travelling to the village, Mama Aleta shared her story of the adat community's struggle against marble mining in the Mollo Utara sub-district. Mama Aleta described how she was jailed and harassed, but eventually the community won the battle against the mining company.

The focus group included 16 people ,a mix of men and women ranging from teens to elders. The discussion started with some customary rituals.

Issues with the implementation of RAN-PI

In her opening speech, Mama Aleta mentioned the RAN-PI; however, the group had never heard about it and seemed uninterested. The focus of the discussion was on food and seed scarcity due to extreme and unpredictable weather in the past few years. This was identified as being most severe in 2009. The group shared stories and knowledge on how they examined natural signs for almost every aspect of their lives; but now they were frustrated at their incapacity to cope with recent rapid and unknown changes to the climate. They expressed disillusionment with traditional *adat* rituals' power to control their natural resources and crop productivity. This "disaster" had gradually undermined their lives and spirit.

Most of the group still maintained their *rumah bulat,* but the management of food and seeds had been disrupted. They tried to survive through edible wild-growth, such as bananas, sweet potatoes, cassava and peanuts, cautious that by resorting to their cattle, pigs and chicken they would be removing their final safety net. They had prepared the land to sow and grow seeds, but seeds were scarce due to failed crops in previous seasons. Water was a limited resource following successive droughts and had led to a number of village conflicts. Those community members who were young and strong sought their fortune as migrant workers elsewhere, leaving the elders and children at home. The women had started to sell their family heirlooms of beautiful traditional, hand-woven textiles. The village was experiencing multiple pressures and trying to adapt through a number of alternative income sources.

Research priorities identified by the participants

The group declared that the priority should be the prompt establishment of alternative livelihoods and new crop varieties. The community needs new ideas that will help revitalize the current disenchantment towards traditional wisdom and knowledge. It must be shown that it is possible to adapt to climate change and negotiate natural hazards. New crop varieties should have a shorter life span and be able to survive with little water. They should be introduced through a programme that also preserves local plant species.

Capacity needs identified by the participants

For the better management of water resource and farming systems, it was agreed that the village should organize themselves into a collective or people's organisation, use consensus to resolve water disputes, and share seeds.

Village level, coastal *adat* community of Tuapakas, Kualin[23]

Kualin is a coastal sub-district of South Central Timor, facing the Indonesian Ocean to the south. The beach is covered by colourful stones and gravels which have been mined and exported. Like in other villages in South Central Timor (and perhaps across Nusa Tenggara Timur), people here are facing extreme and unpredictable weather. This is causing crop failure, changes to sowing seasons, and further food and seed scarcity.

Unexpectedly, around 97 participants came to the discussion, a mix of men and women of all ages. This was possibly because Mama Aleta had announced the discussion during a recent church service and invited everybody to join. A customary ritual opened the event.

Issues with the implementation of RAN-PI

As in Lelobatan, unpredictable weather had undermined customs and traditional wisdom. People said they could no longer rely on traditional methods to guide their daily activities. For instance, previously stars were used to determine sowing and harvesting seasons; however, the group agreed that this was no longer a reliable guide to seasons. *Adat* leaders had begun to lose their faith and belief in traditional customs.

Dry vegetation of South Lombok
Photo Credit: Albert Salamanca

Climate change was not the only challenge facing the village. Offshore mining exploration had been using dynamite, killing reef fish and seriously threatening fish productivity in the area. Fishermen reported that since the mining company (suspected to be a joint venture between Indonesian and Australian companies) began operation in 2010, their catch had significantly decreased. They hoped somebody more powerful, either from Kupang, Jakarta or Australia, could help to advocate their cause and stop the mining ships. After the meeting, some men remained to continue to discuss the matter with Mama Aleta.

Another subject of debate was gravel mining on the beach. The mining has provided an alternative income for both men and women. However, in the longer term, it may lead to coastal erosion. The group agreed that this growing sector needed to be observed and controlled. It was claimed that investors were mostly foreign and tended to ignore the knock-on effects of the business.

It was noted that women collaborated in the production of beautiful traditional, woven textiles. These were used as "savings" or "deposits". Previously, it had been possible for women to become extremely skilful, creating inventive, intricate, patterns. However, when other sources of income failed, their collection of woven textiles were used as collateral. It was now difficult to buy enough thread to weave, there was less time for weaving, and buyers were difficult to come by.

[23] The focus group discussion was held on the morning of Sunday, 18 September 2011. Afterwards locals attended services in churches of various denominations.

Research priorities identified by the participants

The short-term priority was seen to be the swift establishment of alternative livelihoods and new crop varieties.

Capacity needs identified by the participants

Again, it was agreed that alternative livelihoods are sorely needed. These should be attuned to the needs and characteristics of coastal communities.

Village level, lowland agricultural adat community of Polloh, Panite, Amanuban Selatan[24]

Polloh is a village in the agricultural lowlands of Amanuban Selatan sub-district. It is located between the mountain and the coastal areas of the island. It is a dry land, but occasionally floods in both the wet and dry seasons. Since 1997, following above-average precipitation during the rainy season, standing water has remained until the middle of the dry season. This kept the soil moist and allowed the growth of a variety of vegetables. In 2003 the water gradually receded, and by 2007 there was no standing water. The water advanced again in 2009 but was lower than before. This phenomenon had been advantageous to the community, increasing the growing period and allowing for the growth of organic vegetables. Having said that, judging by the standard of houses and yards, this village looked to be one of poorest among the communities visited during the scoping assessment.

Only eight people came to the focus group discussion, a mix of men and women, all farmers; some brought along their young children.

Issues with the implementation of RAN-PI

The farmers here had minimal knowledge of government policies or regulations, so it was unsurprising that they had not come across RAN-PI. The discussion on climate change and its implications proved enlightening for the group, and was linked to some recent weather events and seasonal change. The participants were very proud of their small organic gardens and the fact they only required modest natural inputs. Some farmers in the village were landless but found work as labourers. Moreover, women created hand-made textiles that acted as material assets and were used as insurance in the case of crop failure. The village had an effective, if unrecognized, adaptation capacity.

Research priorities identified by the participants

The farmers were eager to grow new crop and vegetable varieties. The group identified three key adaptations for a new crop: short life spans, greater resilience to unexpected and unpredictable weather, and better resistance to pests.

Capacity needs identified by the participants

The group agreed that alternative livelihoods could be required in the near future. Currently, the government provides rice aid for the poor (*raskin berasuntuk orang miskin*); however, this was seen as insufficient in the face of rapid climate change.

[24] The focus group discussion was held on 18 September 2011, the same day as the Tuapakas meeting, and was again facilitated by Mama Aleta.

National-level focus group discussion in Jakarta

Participants of the focus proup discussion in Mataram
Photo Credit: Albert Salamanca

This discussion was seen as a means of sharing the results of the meetings at the provincial, *kabupaten* and village levels of Bali, West Nusa Tenggara (Lombok) and East Nusa Tenggara (West Timor). The event also included a discussion on the need to mainstream climate change adaptation and disaster risk reduction. During the meeting, the initiatives, programmes, working areas and sites, achievements, and education mentioned by the previous focus groups were discussed.

We were disappointed that the participants were predominantly from national and international NGOs. This was despite invitations and notices being sent out to government officials and donor agencies some weeks before the meeting. The meeting was held in Jakarta on 6 October 2011; 19 individuals attended, aged between 25 and 45 years old, with a balanced gender split. The group was composed mostly of activists dealing with disaster risk reduction issues.

Issues with the implementation of RAN-PI

At the national level, the discussion centred on the issue of integrating adaptation and disaster risk reduction. Participants argued that at the community level, mitigation and adaptation should be mainstreamed into other development issues. It was agreed that it is not essential to differentiate between adaptation and disaster risk reduction actors – for the recipients of assistance the difference has little significance. Rather, there should be a focus on coordination and collaboration between governmental and non-governmental organizations; there should be a concerted effort to reduce the current sectoral approach to development planning.

The group also discussed the lack of RAN-PI assessment. The National Planning Body (*Bappenas*) is currently planning to issue a new National Action Plan (RAN) on adaptation. A member of WALHI (the Indonesian Forum for Environment) complained that there were too many RAN documents, with little consideration or analysis of their effectiveness. It was pointed out that their contents are often overlapping or conflicting. Horizontal integration at the national level is required so that a coherent master plan can then be transferred to regional planners. This needs to be supported by binding regulations. RAN-PI still requires a legal basis for its effective implementation.

On policies:

The integration between adaptation and disaster risk reduction appears relatively simple on paper; however, in reality, participants said, these policies are too focused on funding or specific projects rather than people's needs. All sectors require policy analysis. This would elucidate how adaptation and disaster risk reduction can be incorporated into medium-term development plans at all levels (national, provincial, and *kabupaten*). On the ground, the bureaucracy remains a constraint; national policy should aim to reduce friction at the regional level. However, new national laws, ministerial decrees, and governor (*bupati*) regulation will only be effective if they are administered alongside legal education of local government actors.

Photo Credit: Albert Salamanca

Sanur Beach in Bali
Photo Credit: Albert Salamanca

On institutions:

At the national level, sectoral "egos" were identified as a key problem, preventing coordination between government departments. At lower administrative levels the chief limiting factor was seen to be the high turnover of officials. Local government officials are frequently moved between departments. This may lead to coordination problems and makes it difficult to invest in capacity-building and human resource development. This produces a condition where specialized knowledge is seen as undesirable – a disruption to the smooth running of departments – and so climate change knowledge holders tend to become alienated and sidelined. Further, community actors must be assisted in lobbying government institutions. Empowering community members will lead to greater implementation at higher institutional levels. It was agreed that a bottom-up approach would be the most effective way to instigate local government action.

On funding:

Corruption remains a significant problem. Partnerships between international institutions and their national counterparts are often not transparent. Citizens found it difficult to access climate change funding and public information. It was said that funds are intentionally difficult to access, with participants coming up against a "wall of bureaucracy".

The majority of climate change funds are still administered by international agencies (United Nations Development Programme, GIZ, HSBC Singapore) with unclear channels and allocation; this leads to central government institutions competing for funds and spending money to create departments to access funds. The focus group suggested that sound funding regulation is needed. An independent agency should oversee the allocation of climate change funds in Indonesia; this should be open and accountable. Indeed, there is an effort to make the budget structure more efficient. However, in reality funds remain unfairly distributed, difficult to access and insufficient. Compared with climate funds, disaster risk reduction funds are still limited. Therefore, it was seen as beneficial to integrate adaptation and disaster risk reduction funds and action. The group said there had been an effort to map climate change funding, but it was admitted that this needs to be improved and should include other relevant knowledge, such as on vulnerability and socio-economic conditions.

On programmes:

There is already some integration between adaptation and disaster risk reduction programmes. To increase the scope of projects, the focus group suggested collaborating with independent groups, community radio and local champions. There is also a need for the interpretation of external/foreign programmes into local languages and contexts, especially where social, cultural and environmental diversity exists. Finally, it was stated that the encouragement of participatory action research (PAR) on adaptation and disaster risk reduction by NGOs and people's organizations should be continued.

Research priorities identified by the participants

To define research priorities, participants were asked: What knowledge and technologies are needed to enhance adaptive capacity and build resilience? Answers included:

- Knowledge concerning the predicted future impacts of climate change and data for disaster risk reduction are accumulated in international NGOs and agencies or universities. This information needs to be translated into local languages and distributed at the *kampung* level, among local government officials, community leaders, youth leaders, teachers and students.
- Local community and government officials need better access to up-to-date information that is relevant and user-friendly.
- Farmers, fishermen and other local food producers need climate change analysis so that they can anticipate changes and sustainably manage resources. This should be linked to sowing and harvesting patterns, alternative crop options, etc.
- Coordinated action to disseminate climate change information at the local level (*kabupaten*).

Capacity needs identified by the participants

Suggestions on how to address the capacity needs of different stakeholders included:

- Government departments need strong and clear integration, coordination, and a better understanding of the issues surrounding adaptation and disaster risk reduction. Support for the growth of "climate field schools" (*sekolah lapang Iklim*) throughout the country, involving relevant stakeholders, is also needed.
- Local governments need to establish task forces by utilizing and empowering existing local institutions/organizations, and assisting local champions and volunteers in advancing their understanding of adaptation and disaster risk reduction issues. Capacity-building could tap the spirit of volunteerism.
- NGOs and universities need to share capacity, resources and learning.
- Communities need intensive studies and documentation on local and traditional knowledge. This should be updated so that it is relevant to adaptation and resilience. Modern technologies need to be adopted and used in conjunction with local/traditional wisdom. The protection of indigenous intellectual property rights should also be considered.

Strategies suggested to help meet these capacity needs included:

- Collaborating and cooperating with partners
- Focusing on the *kabupaten*/municipality/city levels
- Advancing the learning process
- Developing mechanisms for data analysis and channelling information from agencies to users; this requires the translation of climate information into local languages.
- Identifying and empowering local champions
- Taking a bottom-up approach, strengthening local ownership
- Working with alternative media and journalists
- Innovative information and education campaigns; conducting community perception monitoring to evaluate effectiveness, and set-up new efficiency expectations
- Field schools for children and youth with "back to nature" campaigns
- Making disaster risk reduction actions mandatory, with sanctions for non-compliance
- Smart reading on driving forces or interests behind the policy-making process, taking advantage of socio-economic/cultural/political momentum (e.g. local election process)

Sanur Beach in Bali
Photo Credit: Albert Salamanca

Summary of key findings and recommendations

Given the limited budget and time, we could not visit other more marginalized and vulnerable islands, such as the Sumbawa Island of Nusa Tenggara Barat, Flores Island, and the numerous other smaller islands of Nusa Tenggara Timur. These islands have diverse ecosystems, cultures, and political and socio-economic issues. To develop a complete picture of the situation across Indonesia would require further visits and surveys on these islands.

At most focus group discussions, especially those at the village level, two hours gave only a preliminary exploration of the issues surrounding climate change. Participants needed time to absorb and digest the information before they could begin to answer the guide questions. Often we found the focus groups served more as a learning experience for participants than a discussion. At some meetings it was apparent that participants were uninterested in technical climate change information, preferring to discuss what they perceived, witnessed, or experienced.

That said, several important concerns emerge from the scoping assessment. These are:

A. NAPCC/RAN-PI Implementation

First, although the document was adopted in 2007, implementation has been generally poor. In Bali, during the provincial-level focus group discussion, we found that the RAN-PI had been adopted as a Provincial Action Plan on Climate Change (*Rencana Aksi Daerah untuk Perubahan Iklim*) in 2009, but had not then been transferred to lower administrative levels. Similarly, at the provincial-level focus group discussion in Mataram, Nusa Tenggara Barat government officials discussed the drafting of their Provincial Action Plan on Climate Change, but there had been no action. Although the Tabanan *kabupaten* knew of the document, there was no incentive to implement action. North Lombok *kabupaten* had the poorest RAN-PI familiarity, with only three of the 15 participants aware of the document.

In general, knowledge on climate change science and policy decreased as one moved eastward away from Bali. This is partly due to Bali's recent history of large international climate change events. In 2007, a United Nations Climate Change Conference (COP 13) was held in Bali, resulting in the Bali Action Plan to negotiate a replacement for the Kyoto Protocol after its lapse in 2012. During that time, substantial activities were carried out in Indonesia in general and in Bali in particular. Climate change is not seen as an urgent issue at the local level, where immediate development problems such as the disruption of traditional natural resource management systems come first. It can be concluded that the influence of the RAN-PI document has been limited, with only occasional transmission to lower administrative levels.

B. Research Priorities Identified

- *Suitable innovations to food scarcity:* What technologies and seeds are attuned to a drier climate? How can current assets be used to adapt to climate change and extreme events? How can seed banks be adapted to future climate while maintaining indigenous crops?
- *Adaptation at the local level:* What are the best forms of adaptation for island communities? How do you prepare coastal and small island communities for long-term climate change and future disaster risks? Are islands legitimate administrative units to access climate change funds and services?
- *Cross-cutting and fundamental issues:* How much of the survival of groups depend on access to fundamental human rights? What is the human rights angle of adaptation? Would households with better use and access rights to certain resources adapt better to climate change impacts? Are islands legitimate administrative units to demand government services? What are the bargaining rights of small islands? What are the ramifications of migration? Is adaptation a gendered process?
- *Legal priorities:* To what extent do communities rely on rights and legal foundations for adaptation? Would improved rights allow households to more effectively adapt to climate change? What are the current bargaining rights of small islands?
- *Local knowledge:* How do you document local knowledge effectively? How do you link this knowledge to adaptation? How can knowledge be transferred to the next generation? How best to transfer local knowledge between communities? Is the mapping approach, as used by the Centre for the Support of Native Lands, the most effective approach for adaptation?

C. Adaptive capacity development strategy

- Identifying local champions, who provide an entry point to the empowerment of the wider community
- Targeting small grants, which provide a more effective distribution of funds than larger grants
- Wherever possible, supporting existing efforts; this requires the acknowledgement of possibly unidentified adaptation and disaster risk reduction techniques.
- Supporting environmental education and technological innovation
- Building capacity by supporting community institutions and local champions
- Creating a portfolio of flexible training packages
- Continuing to create climate change field schools (*sekolah lapang Iklim*)
- Building dialogue between scientists and community members
- Ensuring sensitivity to local politics and power hierarchies
- Appreciating that there are always multiple stakeholders; finding and supporting a common agenda has the potential to lead to positive interaction outside climate change issues.
- Creating a local knowledge/wisdom network to transfer knowledge between communities and generations.

D. Adaptation information and knowledge management

The scoping assessment took note of the knowledge management systems existing at the national and local levels. At the local level, all known systems are facilitated by NGOs. In Lombok, Santiri started a system of information sharing at the regional (Lesser Sunda/*Sunda Kecil* and Maluku archipelagos) and island levels. At the regional level, information is shared over the internet (www.rumahalir.or.id), through a mailing list (Talasukma), and through an SMS Gateway (087864424411). Rumahalir contains information on the management and governance of natural resources across Indonesia. The website has been operational since late 2000. The mailing list shares information to members of SUKMA, such as policy advocacy outcomes, resolutions to natural resources conflicts, and the results of other activities. Still at an early stage, the SMS Gateway aims to provide short news items for immediate distribution to its members. The gateway also serves to disseminate information on imminent disasters and the planning of activities. In the future, it is planned that market information will also be shared through SMS.

SUKMA covers eight focus islands: Bali, Lombok, Sumbawa, Maluku, North Maluku, Flores, Sumba and Timor. Activities on the focus islands are managed by NGOs. SUKMA also operates model projects to promote its objectives. These model areas are located in North Lombok, Central Lombok and Timor. These models are at the *kabupaten* level and are run by citizen organizations. These models are:

- Pikul's system;[25]
- Hasanain's[26] – Islamic boarding school (*pondok pesantren*);
- Samdhana has a knowledge repository but needs to be strengthened as an open source;
- Rumah Iklim – NGO websites on climate change but focusing largely on mitigation – run by Life Mosaic – could be built upon.

It is hoped that more models will be set up on all the focal islands in the future. Challenges include how to develop best practices and policies on natural resources with climate perspectives (Timor), how to assist spatial planning at the *kabupaten* level (North and Central Lombok), how to encourage the government to provide better assistance to the development of natural based livelihoods (North Lombok), and how to strengthen community-based organizations (North and Central Lombok).

[25] Pikul is a local NGO based in Nusa Tenggara Timur.

[26] Hasanain Juaini won the 2011 Ramon Magsaysay Award for his efforts to establish an Islamic boarding school (Nurul Haramain Putri Narmada in West Lombok) for girls. See http://www.rmaf.org.ph/Awardees/Citation/CitationJuainiHas.htm.

Conclusion

The implementation of the Indonesia National Action Plan Addressing Climate Change, or RAN-PI, is generally poor, especially at the lower administrative and community levels. For instance, in North Lombok, only three of 15 focus group participants at the *kabupaten* level knew about the document. Likewise, in Kupang at the provincial level focus group discussion, and in Soe at the *kabupaten* level, knowledge of RAN-PI was minimal.

The principal reason for poor implementation is the lack of a legal basis at the national level. Without this, it will continue to be difficult to take action at lower administrative levels. The legal basis (i.e. national law, ministerial decrees, governor's or *bupati*'s regulation) is required as a justification for adopting the RAN–PI document at lower level *Rencana Aksi Daerah* (provincial or district level Action Plan), local, mid-term development planning (*Rencana Pembangunan Jangka Menengah Daerah/RPJMD*), and budget allocation.

At the national level, the issue of adaptation has already been integrated into disaster risk reduction. However, for implementation to occur, each agency must be given a clear mandate and responsibilities. This must be done with strong coordination and effective communication between departments; only through horizontal integration can a coherent strategy be passed to the regional level.

Finally, there is a disconnect between national policy and implementation at lower administrative levels; vertical integration is required.

Sanur in Kupang, West Timor
Photo Credit: Albert Salamanca

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