

Working with Nature against Poverty:

Development, Resources and the
Environment in Eastern Indonesia

Budy P. Resosudarmo and Frank Jotzo

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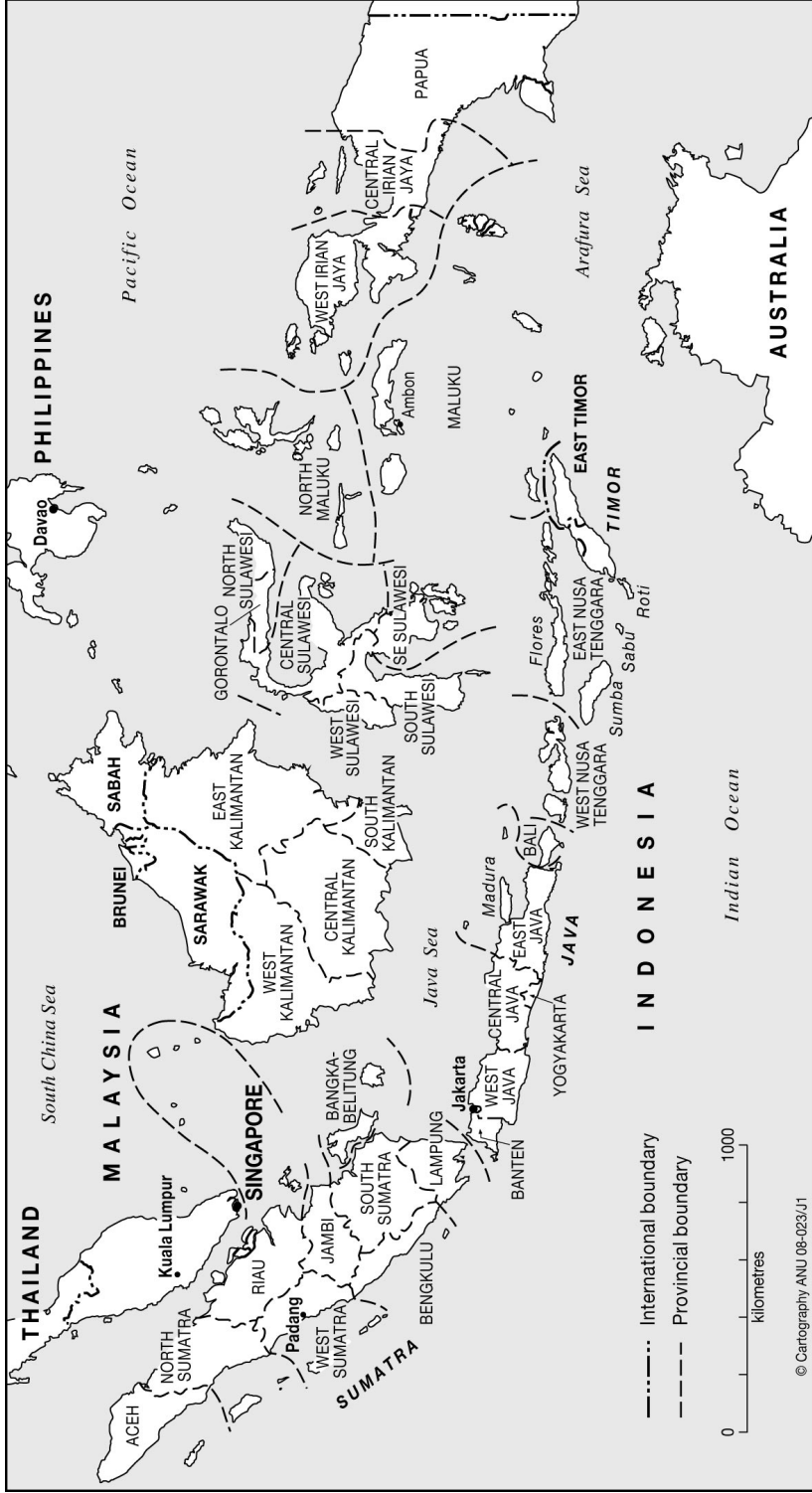
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Map 1.1 The Republic of Indonesia



1 DEVELOPMENT, RESOURCES AND ENVIRONMENT IN EASTERN INDONESIA

Budy P. Resosudarmo and Frank Jotzo

Eastern Indonesia has for a long time epitomized the problems of development in Indonesia, with the region having lower incomes, higher poverty and worse social indicators than most other regions in Indonesia. The challenge is to achieve economic development. But much economic development relies on more intensive use of resources, which places great pressure on the environment. In some parts of the region this could undermine the future sustainability of the economy. In others it threatens unique environmental systems that are of significance not just for Indonesia but for the world.

This book brings together contributions from leading experts on eastern Indonesia. It provides comprehensive information on current economic, social, political and environmental developments in the region. The goal is to provide a framework for balancing environmental and social concerns against the need to promote economic development, particularly in areas where poverty is prevalent. Understanding the interactions, trade-offs and synergies between development and environment is a prerequisite for better policies to benefit both the people of eastern Indonesia and the environment.

The existing literature on eastern Indonesia—especially research on the nexus between resources, environment and development—is sparse. Earlier publications of note include Barlow and Hardjono (1995) and Pannell and von Benda-Beckmann (1998). The present book has its origins in a symposium held at the Australian National University in 2006, which brought together some of the leading researchers on eastern Indonesia.

1 BACKGROUND

Indonesia is the world's largest archipelagic state and one of the most spatially diverse nations on earth in terms of resource endowments, population settlements, locations of economic activity, ecology and ethnicity (Tomascik et al. 1997; Hill, Resosudarmo and Vidyattama 2008). Stretching across 8 million square kilometres of land and sea between the Indian and Pacific oceans, it links the continents of Asia and Australia (Map 1.1). Indonesia's 17,000 islands have a land area of close to 2 million square kilometres. Many parts of the country have abundant natural resources, such as fossil fuels and minerals, as well as rich forests and diverse marine habitats.

In 2005 Indonesia had a population of approximately 220 million, expanding at an annual rate of 1.5 per cent. Of its roughly 350 ethnic groups, the three largest are Javanese (45 per cent), Sundanese (14 per cent) and Malay (7.5 per cent). The vast majority of the population is Muslim (88 per cent), with smaller numbers of Protestants (5 per cent), Catholics (3 per cent) and Hindus (2 per cent).

Ever since Indonesia gained independence in 1945, policy makers and academics have grappled with the problem of development imbalances between regions. Infrastructure such as roads, universities and hospitals has always been more readily available in Java than in the outer islands. In the early 2000s, per capita income in the richest province, East Kalimantan, was around 16 times that in the poorest, Maluku. Poverty ranged from 3 per cent of the population in Jakarta to 42 per cent in Papua (Hill, Resosudarmo and Vidyattama 2008). The discrepancies between rich and poor regions have aroused, and exacerbated, resentment between ethnic groups.

The Indonesian government typically refers to eastern Indonesia as comprising Kalimantan, Sulawesi, East and West Nusa Tenggara, Maluku and Papua. The literature commonly focuses on four of these provinces: West Nusa Tenggara, East Nusa Tenggara, Maluku and Papua. This book concentrates on just three – East Nusa Tenggara, Maluku and Papua – because West Nusa Tenggara is now well connected to Bali. These three provinces are generally considered to be the least developed in Indonesia and the most challenging in which to conduct development activities. They have a combined population of 8.8 million people, a total area of close to 2 million square kilometres and a land mass of 600,000 square kilometres. Each of the provinces we look at has distinct environmental assets, and faces distinct challenges.

2 DEVELOPMENT IN EASTERN INDONESIA

Comparisons with Other Parts of Indonesia

For any Indonesian region, the natural point of comparison is Java, the most populous island and the one generally considered to be the most advanced. Java still has backward rural areas, but most parts of the province have access to the electricity grid as well as reasonable road access to nearby urban areas where goods and services, including health and higher education, are available.

Average per capita income in eastern Indonesia was approximately half that in Java in 2004, rising to three-quarters if Jakarta is removed from the indicators for Java because of its special characteristics (Table 1.1). If per capita income in eastern Indonesia continued to grow at the average rates observed since the mid-1970s, namely 3–4 per cent per year, then it would take 10–20 years for eastern Indonesia to achieve the current level of per capita income observed in Java without Jakarta. However, the long-term growth rate of per capita income in eastern Indonesia is well below that in Java and the Indonesian average, implying that even as eastern Indonesia attains the levels of development currently prevailing in Java, the gap in income will in fact widen over time.

Trends in the poverty data also evoke scepticism about whether eastern Indonesia could achieve Java's present standard of living in just a decade or two. The proportion of poor people in eastern Indonesia was almost 30 per cent in 2004 (Table 1.1), compared with just 22 per cent in Java in the early 1990s (Resosudarmo and Vidyattama 2007).¹ Poverty rates have been declining, with the proportion of poor people in eastern Indonesia falling by 11.4 per cent between 1996 and 2004. This is a greater relative reduction than achieved almost anywhere else in Indonesia, but even so poverty remains very high in eastern Indonesia.

Social indicators other than poverty suggest that eastern Indonesia is lagging even further behind Java without Jakarta (Table 1.1). In 2004, eastern Indonesia recorded levels of infant mortality, life expectancy and education about the same as those for Java without Jakarta in the late 1980s (Miranti 2007). Life expectancy in Papua is a particularly depressing story. Whereas average life expectancy in Indonesia increased by 20.5 years between 1971 and 2002, in Papua it rose by only 8.5 years – the worst result of any province in the country. This reflects poorly on the pace of improvement in health services in Papua. Maluku started out with rela-

1 Here we use the Indonesian government's definition of poor people – essentially those whose total income (measured by their expenditure) falls below a provincial poverty line (see Appendix A2.1, Chapter 2).

Table 1.1 *Indonesia: Provincial Economic and Social Indicators*

Region	Population (million people)	GDP per Capita (Rp million)	Growth in GDP per Capita (% p.a.)		
			2004	2004	1976–90
Eastern Indonesia	8.6	5.8	2.8	3.0	2.9
East Nusa Tenggara	4.1	3.1	4.9	4.0	4.5
Maluku	2.1	3.0	5.4	0.1	2.8
Papua	2.5	12.6	0.3	2.9	1.5
Java	121.5	10.2	6.5	2.7	4.6
Java without Jakarta	112.8	7.8	6.3	2.6	4.5
Bali	3.3	8.5	8.7	3.4	6.1
West Nusa Tenggara	4.3	5.5	5.0	5.9	5.4
Sumatra	45.5	10.8	1.0	2.2	1.6
Kalimantan	12.3	17.3	5.1	3.0	4.1
Sulawesi	15.8	5.9	5.2	4.0	4.6
Indonesia	211.4	10.1	4.8	2.7	3.8

tively high levels of education in 1971 and has recorded slightly higher than average rates of improvement. East Nusa Tenggara, on the other hand, has been lagging behind other regions in educational achievement: from roughly average performance in 1971, it has been growing below the national average ever since.

There are two defining differences between eastern Indonesia and Java, both with major consequences for development. First, eastern Indonesia has a far lower population density. As a result, it cannot hope to achieve the scale effects that were so beneficial for development in Java. Second, geographical conditions are far more challenging in eastern Indonesia. Governments have struggled to provide transport across the scattered small islands of Maluku and East Nusa Tenggara, or to extend communications into the rugged and remote interior of Papua. Inevitably, the costs of transport and communications are far higher in eastern Indonesia than in Java (Hill 1989). Rather than adopting the Java development model, therefore, eastern Indonesia needs its own development path—one that takes local conditions, local economic and social structures and local patterns of resource use and interaction with the environment into account.

Table 1.1 (continued)

Region	Poverty (%)	Infant Mortality (deaths per 1,000 live births)	Life Expectancy (years)	Average Schooling (years in school)
	2004	2000	2002	2002
Eastern Indonesia	29.9	59.2	65	6.4
East Nusa Tenggara	27.7	57.0	64	5.8
Maluku	23.9	66.2	66	8.0
Papua	38.4	57.0	65	6.0
Java	15.9	48.6	67	7.1
Java without Jakarta	16.8	50.4	66	6.8
Bali	6.8	36.0	70	7.6
West Nusa Tenggara	25.3	89.0	59	5.8
Sumatra	17.4	48.0	67	7.8
Kalimantan	10.9	55.3	66	7.2
Sulawesi	16.7	53.9	68	7.3
Indonesia	16.6	47.0	66	7.1

Source: BPS (various years).

The development gap between eastern Indonesia and Sumatra or Bali is at least as great as that between eastern Indonesia and Java (Table 1.1). Although, like Java, Sumatra has some very poor areas, overall it is more developed than eastern Indonesia. Kalimantan, the richest of Indonesia's regions, is also well ahead of eastern Indonesia on most economic and social development indicators, even if its wealthiest province, East Kalimantan, is excluded from the data. But despite the wide gap between them, eastern Indonesia has more in common with Kalimantan than with Java. Kalimantan is a resource-based economy with many remote areas and a few urban areas in which wealth is concentrated. If per capita indicators for eastern Indonesia keep growing at their historic pace, then in one or two decades the economy of eastern Indonesia, particularly Papua, could resemble that of Kalimantan today. That is, natural resource exploitation and industry would dominate the economy and wealth would be concentrated in just a small number of cities.

In terms of income and many social indicators, eastern Indonesia has most in common with Sulawesi and West Nusa Tenggara (Table 1.1), although Sulawesi has performed far better with respect to poverty.

Importantly, comparison at the regional level again masks strong differences within regions. Parts of Sulawesi and West Nusa Tenggara, namely Manado, Makassar and Mataram, are well connected to Java and Bali, and these areas are relatively advanced. But other, less favoured areas have much lower levels of development, similar to those in many parts of eastern Indonesia.

Comparisons within Eastern Indonesia

There are marked differences in development status between the three eastern Indonesian provinces discussed in this book. Economically, Papua is far more advanced than the other two provinces. It is a much richer place in terms of natural resources, principally coal, copper, natural gas and forests (Marshall and Beehler 2007). Exploitation of copper and gold began in the 1970s, initiating development in several parts of the province. Another source of development was the central government, keen to reduce the influence of the Papuan independence movement by delivering visible progress. However, the remoteness of much of Papua meant that central government programs were concentrated in cities such as Jayapura, Biak, Sorong, Manokwari and Merauke. In absolute terms, Papua enjoyed relatively high growth in gross domestic product (GDP) of 3.0 per cent per annum between 1976 and 2004. But in per capita terms growth was relatively slow, at just 1.5 per cent per annum, because of Papua's high rates of population growth, driven by migration.

This highly uneven pattern of development has succeeded in increasing average incomes, but has generally not been effective in improving social conditions or lifting people out of poverty. Tellingly, the proportion of poor people in Papua is higher than that in either Maluku or East Nusa Tenggara, despite Papua's far higher levels of per capita GDP. Between 1996 and 2004, the proportion of poor people fell by 11.2 per cent in East Nusa Tenggara and 20.6 per cent in Maluku, but by just 3.9 per cent in Papua. Papua has the highest poverty rate in the country, and will continue to do so at these rates of change.

Maluku and East Nusa Tenggara are broadly similar on many economic and social indicators. In 1999, before social and political conflict ruined its economy, Maluku was slightly better off than East Nusa Tenggara economically (Hill, Resosudarmo and Vidyattama 2008). It has always had relatively high levels of education by Indonesian standards but has performed poorly on health.

Conflict has been a major obstacle to development in eastern Indonesia. Both Maluku and Papua have witnessed episodes of violence that have been deeply disruptive to social stability and economic develop-

ment. On a lesser scale, parts of East Nusa Tenggara have also been exposed to the flow-on effects of the conflict in East Timor. Although other parts of Indonesia have experienced conflict over the last decade or two, it has not been as persistent or as damaging as it has in eastern Indonesia.

Overall it is difficult to judge which of the three provinces is the least developed. Papua is the best endowed but poverty is more severe there. Each of the three faces distinct challenges.

International Comparisons

Indonesia is not alone in having backward regions. An example in the immediate neighbourhood is Mindanao in the Philippines, which has consistently lagged behind other regions, in part because of its long history of conflict (Balisacan and Hill 2007). Examples further afield include the northern parts of Thailand, the western regions of China and many parts of India. There is certainly nothing unique about eastern Indonesia's development status *vis-à-vis* the rest of Indonesia.

Aggregate economic and social indicators for eastern Indonesia, the poorer countries of northern Southeast Asia (such as Laos) and many states in the Pacific are similar. Some of the underlying structural impediments to development are the same, such as low population densities, long distances, lack of infrastructure and poorly developed markets.

In all of these cases, the question is whether and how development can be accelerated. Crucial in this regard is the extent to which a country's development status is a function of policies and institutions that can be improved, and the extent to which it is inevitable because of structural factors such as poor soil, an adverse climate or difficult geographical conditions. Lessons learned from successes and failures in other Asia-Pacific countries are important for eastern Indonesia.

3 RESOURCE ENDOWMENTS AND ENVIRONMENTAL ASSETS

Although Papua stands out as one of Indonesia's richest regions in terms of natural resources, Maluku and East Nusa Tenggara are not without assets of their own. Mining is significant in the northern part of Maluku. Although levels of activity have dropped off since conflict broke out in 1999, Newcrest continues to mine coal on the island of Halmahera and BHP Billiton is still extracting nickel on Gag island. Forestry also contributes to the economy, with logging operations spread out across the province. East Nusa Tenggara is not well endowed with either forests or minerals, but like the other two provinces it has access to the marine

resources of the Arafura Sea, one of the richest fishing grounds in the country.

With all three provinces having access to at least some natural resources, one might speculate that natural resource extraction could act as the engine of growth for the region. Doubts have been expressed, however, about the effectiveness of natural resource extraction as an engine of economic growth. History shows that rich endowments of natural resources can be either a 'curse' or a 'blessing' for a region. Sachs and Warner (2001: 828) found that:

there is virtually no overlap between the set of countries with large natural resource endowments—and the set of countries that have high levels of GDP ... [Moreover] extremely resource-abundant countries such as the Oil States in the Gulf, or Nigeria, or Mexico and Venezuela, have not experienced rapid economic growth ... [Hence] resource intensity tends to correlate with slow economic growth.

In many developing countries, natural resource extraction is a source of conflict—among resource-extracting firms, between firms and local communities, between firms and authorities, among the various levels of government, between local communities and local authorities, and within local communities (Azis and Salim 2005).

Nevertheless, many resource-abundant Southeast Asian economies have experienced periods of sustained economic growth, indicating that they may be different in some way from the group of countries examined by Sachs and Warner (Coxhead 2005). In Indonesia, two of the four best endowed provinces, East Kalimantan and Riau, have become increasingly prosperous without any major disruption to the peace. But two others, Aceh and Papua, have experienced serious conflict (at least until the early 2000s). Lack of equity in the distribution of mining revenues is a longstanding source of conflict between the central government and the Acehnese and Papuan elites, and between mining companies and locals. It is one of the main grievances fuelling separatist movements. Conflict over mining has also occurred in Maluku and many other parts of Indonesia. However, even in Aceh and Papua socio-economic conditions have improved, and on the whole it appears that rich endowments of natural resources are more an advantage than a curse for most Indonesian regions (Hill, Resosudarmo and Vidyattama 2008).

Eastern Indonesia has an exceedingly rich natural environment, with diverse and unique land and marine ecosystems (Marshall and Beehler 2007; Tomascik et al. 1997). But the region's biological riches are under threat from forest conversion, overharvesting, mining and other activities, as elsewhere in Southeast Asia and in tropical developing countries more generally (Sodhi et al. 2004). Environmental degradation is happening in Indonesia at an alarming rate (Resosudarmo 2005).

The strong negative externalities from resource extraction range from landslides at the local level to climate change at the global level. Deforestation, forest degradation and water pollution from mine tailings are some of the causes. It is no easy task to marry environmental and development objectives, especially where environmental conservation competes directly with economic activity and people's need to earn a livelihood. For conservation to be effective, governments may need to compensate those who face losses when high-conservation areas are closed to overexploitation, and devise programs that give local farmers and fishers the tools to find other ways of sustaining a livelihood. This is particularly difficult for governments that have very limited finances, and may require resource transfers from developed countries that have an interest in preserving environmental values.

4 LOOKING AHEAD

What can be done to close the development gap between eastern Indonesia and the rest of the country? Better connections to the global economy would certainly help, as international studies and the experience of several fast-growing Indonesian regions, particularly Jakarta, Bali and Batam, attest (Hill 2007; Hill, Resosudarmo and Vidyattama 2008). At present there are no direct flights between eastern Indonesia and Java, let alone between eastern Indonesia and the rest of the world. It typically takes a full day to fly between Java (the heart of the Indonesian economy) and any of the eastern Indonesian capitals. Ferries tend to run infrequently, although East Nusa Tenggara has benefited from the development of a road and ferry network connecting Lombok in West Nusa Tenggara with Bali and, by extension, Java.

Industrial activity is known to stimulate regional growth (Fujita, Krugman and Venables 2000; Hill 2007) but cannot occur without a good internal transport and communications network. The literature indicates that this is important to lower the costs of production, and so help create industrial clustering and increasing returns to scale. Given eastern Indonesia's low population density, it would be hard to create the kind of industrial clustering seen in Jakarta, Bali or Balikpapan. It is nevertheless important to improve transport and communications within eastern Indonesia, to encourage industrial development.

Good institutions and governance are also universally important for regional development (Shleifer and Vishny 1993; Knack and Keefer 1995; Easterly, Ritzan and Woolcock 2006). In the case of eastern Indonesia, the two aspects of governance that can be expected to have the most immediate impact on growth are to improve the quality of public sector human

capital and to eliminate corruption. The quality of local government staff in eastern Indonesia is generally poor. As a consequence, many local governments are incapable of formulating high-quality development programs for their areas. The situation is not as bad in East Nusa Tenggara and Maluku as it is in many other provinces, but the same cannot be said of Papua, where significant improvements in the quality of personnel are urgently needed. Eliminating corruption is also of great importance, because it diverts large sums of money that might otherwise be used for development to the elite. Again, this is particularly important in the case of Papua.

Private sector engagement is another universally important aspect of development; in fact, private sector business activity can be seen as a fundamental prerequisite for economic prosperity in any region. To achieve sustained economic development, private sector activity in eastern Indonesia needs to expand significantly. Better infrastructure (including better connectivity) and better governance would help to remove some of the obstacles to private sector growth, but may not be sufficient to attract business on a large scale. Direct policies to promote business, such as subsidies or tax concessions (as in the case of Batam), may work if other preconditions are met, but raise the question of whether they are a good use of public funds. It should also be remembered that large-scale industrial activity can undermine environmental systems and compromise local livelihoods, as comes into sharp view with, for example, some mining projects.

Natural resources clearly play a major role in regional development. However, the utilization of such resources must take into account issues of equity and sustainability, and the possibility of negative externalities. Resources need to be extracted in a sustainable way to ensure that present and future generations are able to reap the benefits of local resources. Prudent management of resources and the environment pays for itself by preserving economic opportunities for the future.

In rural eastern Indonesia, where extractable resources are scarce and sizeable manufacturing or service activities unlikely to spring up, economic and social development will most likely have to come from improvements in productivity and better management of agriculture, fisheries and forestry. Hence, better watershed and environmental management, the provision of technical assistance to farmers and fishers and the creation of strong institutions to underpin agriculture, fisheries and forestry will be of paramount importance. The Indonesian experience shows the importance of having programs directly targeted at alleviating poverty (Resosudarmo and Vidyattama 2007). In this context, traditional development strategies such as programs to provide better education and health facilities, to direct credit to the poor and to expand irrigation networks clearly have a role to play.

The list of what can and should be done is long, and the right strategy is very specific to the local context. For development to be sustainable, the eastern Indonesian provinces need clear frameworks to promote economic development, accelerate poverty alleviation and preserve environmental conditions. A more holistic understanding of developmental and environmental issues in eastern Indonesia is a prerequisite. This book aims to go some way in that direction.

5 OVERVIEW OF THE BOOK

This book consists of 14 chapters organized into three parts. Part I describes economic, social and political conditions in each of the three provinces, with a particular focus on poverty alleviation and development strategies.

Chapter 2, by Budy P. Resosudarmo, Lydia Napitupulu, Chris Manning and Velix Wanggai, describes political developments in Papua since the collapse of Soeharto's New Order administration. Perhaps the most momentous of these was the passage of the Special Autonomy Law (Law No. 21/2001), which gave the province greater financial resources and more say over its own development path. While diminishing the calls for an independent Papua, the law has encountered problems that the authors detail. The chapter then turns to another defining feature of the province: its high rates of demographic change, mainly due to in-migration. As well as affecting population growth rates, this has changed the ethnic, religious, migrant versus indigenous and urban versus rural composition of the province. Next, the chapter reviews social and economic indicators for Papua, including its ranking on the human development index (HDI) and its performance with respect to trade and GDP. It concludes with an in-depth look at poverty trends across Papua.

In Chapter 3, Budy P. Resosudarmo, Lydia Napitupulu and Chris Manning turn their attention to the fiscal impact on Papua of the central government's decentralization and special autonomy policies. The authors explore both the opportunities the new policies have created to implement more effective economic development policies in Papua, and the challenges to doing so. On the plus side, they note the huge increase in provincial and local government budgets, and the commensurate increase in local responsibilities and control. On the minus side, they point to the destructive effects of the increase in the number of new districts and the challenges posed by corruption, poor infrastructure and lack of private investment.

Chapters 2 and 3 both make extensive use of statistical data. Chapter 2 therefore provides an appendix on the quality and reliability of Indonesian statistics in general, and of the Papuan poverty and GDP statistics in

particular. Appendix A2.1 is written by Bambang Heru, a staff member of the Indonesian statistical agency, BPS.

In Chapter 4, Budy P. Resosudarmo outlines administrative, demographic, social and economic conditions in Maluku, against the background of the conflict of 1999–2003. Like other provinces, Maluku has seen a plethora of new districts established since 1999, with the usual problems of disruption to local government finances and development programs. Population statistics reflect the effects of the conflict, with the population actually declining between 1999 and 2000. Social indicators are mixed: the province slid backward on the HDI but continues to score above the national average; educational outcomes are relatively good; and health indicators have worsened. Economically, Maluku is struggling. Poverty has also worsened since 1999, if not to the extent one might expect. The chapter highlights the need for prudent fiscal policy, to get Maluku back on its feet.

The final chapter in this section, by Colin Barlow and Ria Gondowarito, focuses on rural development in East Nusa Tenggara. The chapter first provides a comprehensive review of economic, social, political, geographical and agricultural conditions in East Nusa Tenggara. It then discusses poverty, and how it might be alleviated. The authors highlight practical measures to achieve rural development, such as better infrastructure and improved production and marketing techniques. They also offer a brief assessment of several initiatives already on the ground, the success of which is closely related to their ability to engage the local community.

Part II of the book explores the tension between natural resource exploitation and environmental protection. Chapter 6 by Ian M. Dutton, Rili Djohani, Setijati D. Sastrapradja and Karla M. Dutton argues the need to balance biodiversity conservation and development in eastern Indonesia. The biological diversity of eastern Indonesia is of global importance from both an evolutionary biology and socio-political perspective. The region's resources are increasingly coming under pressure, however, as global demand for all types of natural resources increases, as comparable resources in western and central Indonesia are depleted and as the regional population expands. On a more hopeful note, the chapter offers four case studies of innovative approaches currently being used in Central Sulawesi, North Sulawesi, Komodo island and West Papua to conserve biological diversity and secure sustainable livelihoods for the local community.

Chapter 7 by Chris Ballard and Glenn Banks discusses the evolving corporate strategies of Freeport, owner of the hugely profitable Grasberg mining complex in Papua, as it adapts to the post-Soeharto political environment. The authors first review the company's long history of involve-

ment in mining in Papua, which extends back to the 1960s. They then discuss the company's mining, political and environmental strategies, its troubled relations with local landowners and its close relationship with the Indonesian military. The authors conclude that Freeport will continue to conduct 'business as usual' in Papua for many years to come, based on the ability it has demonstrated to withstand dramatic transformations at the global, national and provincial levels.

In Chapter 8, Budy P. Resosudarmo, Lydia Napitupulu and David Campbell investigate the subject of illegal fishing in the Arafura Sea. The authors describe the national legal regime for fishing in Indonesian territorial waters, the nature of illegal fishing and the jurisdictional inconsistencies created by the new decentralization laws. They argue that the most dangerous and destructive perpetrators of illegal fishing are large-scale operators with international networks and close connections to the Indonesian elite. Not only do their activities deplete fish stocks, but they drain national finances, deprive local fishermen of their livelihoods and place social and economic pressures on local communities. The chapter concludes by reviewing the progress that is being made to combat illegal fishing and by offering some policy options to prevent and mitigate the effects of illegal fishing.

Chapter 9 by James J. Fox, Dedi S. Adhuri, Tom Therik and Michelle Carnegie turns to the subject of illegal fishing by Indonesian fishermen in Australian territorial waters. The chapter discusses the driving forces behind the fishermen's activities and describes their networks of operation. It stresses the importance of generating alternative livelihoods for those engaged in illegal fishing as part of an overall policy to eliminate illegal fishing in Australia's northern waters.

In Chapter 10, Hidayat Alhamid, Peter Kanowski and Chris Ballard discuss the issue of forest tenure in Papua. Drawing on the case of the Rendani Protection Forest adjacent to the town of Manokwari in the Bird's Head peninsula region, they investigate indigenous forest management practices and indigenous forest utilization regimes. They review the history of conflict over forest access and use in Rendani, as a microcosm of the conflict over resource use in Papua more generally.

Chapter 11 is about climate change. Frank Jotzo, Ida Aju Pradnja Resosudarmo, Ditya A. Nurdianto and Agus P. Sari summarize the anticipated effects of climate change in Indonesia and options to reduce greenhouse gas emissions. Research is evolving on this topic and data are especially patchy for eastern Indonesia. However, enough information is available for the authors to draw some options for climate change mitigation and adaptation policies to support the development of eastern Indonesia.

Part III focuses on issues related to conflict, local development and health. Chapter 12 by Craig Thorburn provides an in-depth look at the

situation in Maluku since conflict broke out in 1999. The author discusses the historical, economic and cultural roots of the conflict and describes how and why it spread. Although the conflict officially ended with the signing of the Malino Peace Accord in 2002, its reverberations continue. Thorburn singles out two issues in particular for discussion: the plight of internally displaced persons and the role of local government reform in effecting a lasting recovery.

In Chapter 13, Astia Dendi, Heinz-Josef Heile and Stephanus Makambombu assess the performance of one of the programs set up to alleviate poverty in East Nusa Tenggara, in order to extract lessons for other livelihood development programs. The Poverty Alleviation and Support for Local Governance Program (PROMIS) takes a two-pronged approach to livelihood development: it aims to assist rural populations to expand their economic activities, and it aims to strengthen local institutions. The authors find that this integrated approach to poverty alleviation is one of the strongest aspects of the program. They conclude that the success of the program hinges on its ability to align its goals with those of the community and harness individual, community and local government participation.

The final chapter of the book, by Endang R. Sedyaningsih and Suriadi Gunawan, discusses health conditions in Papua in relation to the goals of Healthy Indonesia 2010, a Ministry of Health initiative. The chapter describes the historical and more recent development of health services in Papua. It details the nature and extent of communicable diseases such as malaria, tuberculosis and HIV/AIDS, and reviews the nutritional status of Papuans. The chapter concludes by discussing the action needed to close the gap between the current health status of Papuans and the targets set for the province by Healthy Indonesia 2010.

6 MAIN FINDINGS

This book covers a broad range of issues to do with development, resources and the environment in eastern Indonesia. In its pages, many researchers bring specialist knowledge and different points of view to bear on the challenges facing the region. Here we attempt to distil the 10 main messages that we, as editors, have drawn from their work. We know that not everyone will agree with our emphases and interpretations, but we nevertheless hope to capture the essence of the main issues.

First, there is strong evidence that development in eastern Indonesia has lagged behind that in Java, Sumatra, Bali and Kalimantan. Of course, it is not the only backward region in the country; Sulawesi without Manado and Makassar and West Nusa Tenggara without Lombok

are equally poor. It is also important to note that over the last three decades, development in eastern Indonesia has not been without progress. Eastern Indonesia has grown at about the same rate as other regions, particularly in terms of economic indicators, but less so in terms of social indicators. It has also done better than many South Pacific countries with similar geographical conditions. Nevertheless, how to alleviate poverty remains a key policy challenge for the region.

Second, adverse initial conditions and difficult geography are the two main factors behind the current lack of development in eastern Indonesia. In the face of these difficulties, government and non-government organizations alike have struggled to find an approach to rural poverty alleviation that works. It appears that an integrated approach consisting of credit provision, technical support, knowledge transfer and active community involvement might work. What is not known is whether such a program can be implemented effectively on a large scale.

Third, as is apparent in Papua and Maluku, conflict is an important obstacle to socio-economic development. To ensure that local arguments do not escalate into destructive social and political conflict, local governments need to establish transparent mechanisms to resolve such disputes. The current democratization and decentralization process is contributing to the prevention of conflict, but more remains to be done.

Fourth, the status of public health in eastern Indonesia is of great concern. Rates of malaria, tuberculosis and HIV/AIDS are significantly higher in eastern Indonesia than in other parts of Indonesia. Difficult geographical conditions, lack of funding and poor human capital are the main hurdles to delivering better health services across eastern Indonesia. The most difficult policy challenge facing local government is how to deliver better health services in rural and remote areas. At the very least, the situation requires closer cooperation and alignment of goals between government, the private sector and civil society.

Fifth, the decentralization policy implemented in 2001 presents opportunities for more rapid development in eastern Indonesia. Regional governments now have larger budgets and more power to formulate their own development policies. In the case of Papua, the special autonomy policy has given Papuans more control over the province's resources, softening demands for independence. However, throughout eastern Indonesia, there is the question of whether the additional funds from decentralization are being spent judiciously on strategic infrastructure, public services and improving the business and investment climate. If revenues are spent in a suboptimal way – most notably, if they are spent on creating new districts or squandered through corruption – eastern Indonesia risks losing the present momentum to build a strong base for future improvements in welfare.

Sixth, natural resource extraction is playing a vital role in advancing economic growth in eastern Indonesia, particularly Papua. In general, local people have benefited from the multiplier impacts of resource extraction, particularly in the form of schools, markets, roads, health centres and, to some extent, increased incomes. Nevertheless, the spread of these benefits has been unable to solve the problems of poverty and health, particularly among indigenous people in rural areas. Finding better ways to distribute the benefits from natural resource extraction, and to avoid resource-related conflict, will require a strong commitment from all involved: the central government, local governments and the local communities themselves.

Seventh, it is time to take a fresh approach to the issue of land and natural resource tenure. Ignoring traditional rights over land and natural resources simply creates conflict, especially between extractors supported by the central government on one side and local communities on the other side. The solution lies in creating a regime in which the validity of both traditional and government laws on land tenure and natural resource ownership are acknowledged. Large companies need to work more closely with local communities and governments so that their operations are actively 'welcomed' by the locals. To win their trust, they need to act with greater transparency and accountability than they have in the past, share their profits with the host community, maintain the environment and support local economic activities. At the same time, local governments need to prepare for the future by giving their communities the resources to sustain alternative means of livelihood. In particular, this means putting more resources into education and improving the technical skills of the population.

Eighth, urgent action is needed to address the problem of illegal extraction of natural resources. Contrary to popular perception, most of this is carried out, not by small operators struggling to earn a living, but by large-scale networks linked with international markets. Tackling this problem must begin at the top, by disrupting the connections between 'bosses' and influential central and local government officers. Other measures would include clearer legislation, stronger enforcement of laws and regulations, and improvements in monitoring capability. Once again it is essential to stress the importance of education and skills in giving local people a way of earning a living without resorting to illegal and destructive fishing practices.

Ninth, it is apparent that development is placing great strains on the sustainability of ecosystems in eastern Indonesia. Key threats to the environment include overexploitation or overharvesting of forests and seas, destructive harvesting (such as blast fishing or the inappropriate use of fire) and habitat conversion (of forests to agriculture and plantations, for

example). The extent of the problem in each area is greatly influenced by the nature of government and community control and management, the preparedness to enforce laws, the degree of corruption and the prices paid for resources and the economic incentives to exploit them. Pure environmental concerns are difficult to accommodate in a situation in which people lack the basic necessities of life. One of the challenges of biodiversity conservation, therefore, is to make it more relevant to the lives and livelihoods of local communities. Some conservation projects designed as 'learning experiments' do hold out hope of balancing conservation and development interests. Upscaling these projects to cover larger territories will be the main challenge.

Finally, Indonesia can expect to face major adverse impacts from climate change in the form of devastated ecosystems. In many areas this can be expected to negate any progress made by development efforts. A combination of sea-level rise and changing hydrological cycle will affect already stretched supplies of water and food. Adapting to climate change will happen automatically in many cases, but in other cases will require intervention. In any event, it will require additional economic resources.

It is true that the challenges of developing eastern Indonesia are enormous. With serious and consistent efforts by the government, the private sector, civil society and local communities, it should be possible to overcome many of these challenges. Without such efforts, eastern Indonesia could become permanently dependent on aid and remittances—something that the people of the region certainly do not want.

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