

## **8 DEVELOPMENT PERFORMANCE AND FUTURE SCENARIOS IN THE CONTEXT OF SUSTAINABLE UTILISATION OF NATURAL RESOURCES**

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### **INTRODUCTION**

Sustainable development requires the integration of economic, social and environmental dimensions, also known as the 'ESE triangle' (WCED 1987; Azis and Roland-Holst 1999). The concept of weak (strong) sustainability maintains that the aggregate (individual) resources should not decline over time. In this chapter, we review the Indonesian development experience in the context of sustainable development and describe some future scenarios that would be more consistent with the goal of a balance between the economic, social and environmental dimensions of development. We focus on the interconnection between sustainable development and utilisation of natural resources.

It is generally agreed that sustainable development requires the prioritisation of resource investment rather than resource depletion. This is relatively obvious for renewable resources, but we argue that it is not reflected in Indonesia's policy record. In the case of non-renewable resources, the government apparently felt that depletion was inevitable and that therefore mining resources should simply be used as needed to support public expenditure. We develop scenarios of alternative rates of resource depletion, analyse the consequences of each and derive some policy implications.

### **ASSESSING PAST PERFORMANCE**

'Plant a stick into Indonesian soil and it will grow into a tree', is the usual perception of Indonesia's rich base of natural resources. Situated on the equator, surrounded by two major oceans and consisting of more than 17,000 islands,

Indonesia ranks near the top of the list for global flora and fauna diversity. In species richness, it ranks first for parrots, butterflies, tropical insects and herbs, second for mammals (behind Brazil) and oceanic fisheries, fourth for primates, fifth for birds generally, and sixth for amphibians. It also has a wide variety of highly valued tropical forests and is rich in mineral resources (Resosudarmo and Subiman 2003).

For many years Indonesia's natural resources were largely untouched due to the political turmoil that swept the country following independence in 1945. Economic development was difficult as a result. However, in the late 1960s Indonesia began a steady, long-term development program based on conventional economic factors rather than social or environmental factors. Such an approach was not unusual at the time: development was considered to be a function of the exploitation of natural resources with the assistance of labour, capital, skill and technology. In Indonesia's case, the approach was straightforward. First, the government would get its finances in order by slashing the budget deficit, controlling inflation, striving for a realistic exchange rate and obtaining financial stability as the first condition for growth. Second, the government would rehabilitate roads, harbours, airstrips, telecommunications, electricity and other economic infrastructure to lay the groundwork for sensible development. Third, the government would focus on meeting basic needs. For example, there would be self-sufficiency in the main staple foods, and primary education and basic health services such as *puskesmas* (community health centres) would be provided through the allocation of public funds directly to villages, bypassing the unnecessary bureaucracy involved in activities such as the presidential Inpres projects. The oil boom in the 1970s provided an impetus for these projects to be implemented on a broader scale (Azis 1990; Thorbecke 1992).

During these early years, as well as ensuring that Indonesia had a predictable and conducive economic environment, the government considered it important to obtain foreign exchange inflows through exports, foreign direct investment and aid.<sup>1</sup> In the initial stages, Indonesia's rich natural resources provided the main attraction for foreign capital. Old plantation managers came back from Europe to explore the possibilities for further investment. Other potential investors focused on the mineral sector. The first large foreign investments were in copper in West Papua, with investment in nickel and aluminium following. In the 1970s, oil became the main attraction. Through contracts of work (CoWs), foreign investors and the state oil company Pertamina made arrangements to develop Indonesia's oil and gas resources, which soon provided most of the country's foreign exchange earnings.<sup>2</sup>

The direct social effects of mining exploration are often negative, especially for local communities. The infamous case of the Freeport McMoRan Copper & Gold operation in Papua clearly points to the fundamental linkages between the

natural resource, environmental and social aspects of development (Walton 2004).<sup>3</sup> Theoretically, indirect social effects through government spending (funded by captured rent) could have been favourable in this case, but in practice the damaging effects of the mining often exceeded the benefits, especially for indigenous people.

Local and indigenous communities complained that their activities in and around the mining area were unjustly disrupted or banned as soon as a foreign company appeared, depriving them of their main sources of income with little or no compensation. Furthermore, damaging environmental impacts from the operation of large mining companies often adversely affected the livelihoods of many local people. For example, fish in the rivers died due to pollution from the mine site, and there was less clean water for cleaning and drinking or for livestock. This was one reason why the World Bank initiated the Extractive Industries Review, chaired by Emil Salim. The recommendations he presented to the World Bank in December 2003 included a proposal to enforce a condition that any decisions on mining projects must be communicated to the indigenous people directly affected by them, in order to ensure that indigenous people have all the information they need to negotiate a fair deal. The goal is to 'elevate the position of the poor and vulnerable to strike a better balance with that of the strong and privileged' (Salim 2004).

On the macroeconomic side, a reliance on primary activities has the potential for countries to experience the adverse effects of the 'Dutch disease'.<sup>4</sup> To some extent, Indonesia experienced a Dutch disease effect when the price of oil surged during the 1970s. However, the impact was softened by two factors. First, the government provided heavy subsidies to the agricultural, rural and infrastructure sectors, so there was an increase in the production of many agriculture-related products (Gelb 1988). Second, there were increased government deposits in the central bank account because the government had saved some of the windfall revenues from the second oil boom. This helped to prevent non-tradable prices from soaring.

The forestry sector was another important earner of foreign exchange for Indonesia. In 1967, the government introduced a system of forest concessions under which firms or individuals were given the right to exploit forests through a system of 'selective cutting' that was intended to provide sufficient time for trees to rejuvenate. Unfortunately, the distribution system for the concessions was far from transparent. Most people who gained concessions were members of the 'inner circle', the power elite (Barr 1998). Foreign investors were not allowed to move into the forestry sector.

The state had control over most forest areas; other stakeholders had only limited control over the land on which their livelihoods depended. Although about 12 million people lived in and around forests, local communities were frequently not consulted prior to the selection of concession sites. Even when

negotiations were conducted, the local communities were often at a disadvantage because property rights were not well defined and laws were not well enforced. For example, even though concession-holders had no rights over settlement areas within the concession sites, they sometimes acted as though they did. In the post-Soeharto period, the effect may have worked in the opposite direction: some communities have reclaimed land or forest on which firms or individuals hold concessions, or have claimed forest on which there are multiple claims (Rhee 2000). Public expenditure could have enhanced the social development of local communities, but its effect was limited by the lower-than-potential rents captured by the government.

In the past, forests were considered purely as a source of revenue; they were not valued as a source of biological diversity, medicinal plants or food. In most cases the legitimate forest concession-holders contracted their concessions to businesspeople with capital. Logs attracted high export prices, so the forestry sector contributed significantly to Indonesia's foreign exchange earnings. It was also a stepping-stone for the growth of big conglomerates (Barr 1998).

In 1981–85, the government banned the export of logs. This stimulated the growth of plywood, craft and paper factories, so increasing the income received per unit of timber. However, the policy was not without controversy, particularly because of its perceived effects on employment. Azis (1992) has shown that the ban was detrimental to employment in the short run, but positive in the medium run. In 1980, demand for an additional 392,000 jobs induced by the increase in 'processed wood' exports failed to offset the loss of 463,000 jobs due to the decline in 'logging and sawmilling' exports. However, by taking into account the direct and indirect employment effects of the changes in exports during 1985–88, the loss of 2,500 jobs from the decline in 'logging and sawmilling' exports was overwhelmingly exceeded by the 1.7 million new jobs from the increase in 'wood products' exports.<sup>5</sup>

Unfortunately, the ban on logging exports failed to reduce the amount of logging, because there was a rapid expansion of domestic and foreign demand for wood products. The government recognised the need to intensify reforestation activities and imposed compulsory fees for this purpose. However, the large amount of funds it accumulated through this means was more likely to be used to write off the debts of the national airplane factory (Christanty and Atje 2004) or build new offices for the Ministry of Forestry than for reforestation.

Meanwhile, the rate of deforestation has steadily increased – from approximately 1.6 million hectares per annum in 1985–97 to 3.8 million hectares per annum in 1997–2000 (Holmes 2000; Purnama 2003). It is estimated that around 65 per cent of Indonesia's wood supply has come from illegal logging. Total forest area is currently estimated at around 109 million hectares. If deforestation continues at the current rate of 3.8 million hectares per year, the total forest area will drop to approximately 50 million hectares by 2024. This sharp

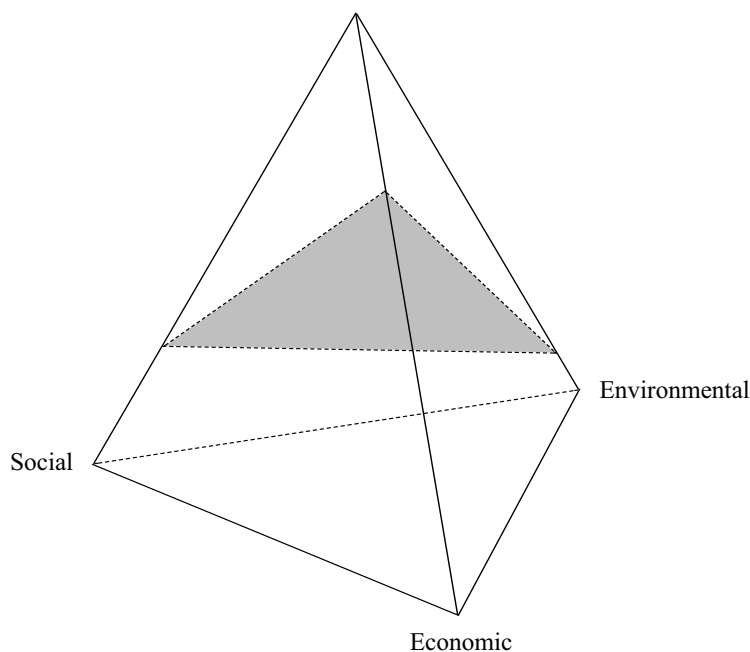
reduction will have serious environmental implications, especially for the hydrology cycle, with negative effects on the groundwater table and water runoff. Indonesia's rich biological diversity will disappear with the forests. In particular, the rapid conversion of forest in Sumatra, Kalimantan and Papua threatens the well-being of several types of endangered primates.<sup>6</sup>

The food sector has also been important. In the 1970s, Indonesia was the world's largest importer of rice. However, the International Rice Research Institute (IRRI) developed a 'miracle rice' variety that provided the opportunity for Indonesia to aim for self-sufficiency in rice production. As Indonesians' main staple food, rice was considered to be a strategic commodity whose price and availability in the market strongly affected the domestic inflation rate. Its price also affected the poverty line: any increase in the rice price would result in more people being below the poverty line and was thus likely to increase the incidence of poverty. The Indonesian government was therefore determined that the country would become self-sufficient in rice once and for all.

However, the growth of 'miracle rice' required dams, irrigation networks, chemical fertilisers, pesticides and other agrochemicals. Moreover, it required harvesting methods and systems that were different from those used for traditional strains. For example, on 'miracle rice' plantations, male labour replaced the female labour of traditional plantations. Indonesia did achieve self-sufficiency in rice production, but only at an environmental cost from chemical-intensive food production. At the time, government officials were not aware of the potential environmental costs, but later experience has indicated that it takes more than 10 years for the soil to recover from the application of artificial chemicals. Agrochemicals have also affected biological resource diversity and polluted the country's rivers. The experience of Rachel Carson in *Silent Spring* (1962) suddenly became vivid. In addition, many of Indonesia's own domestic strains of rice were lost as a result of their replacement by 'miracle rice'.

Indonesia moved forward rapidly on the economic front in the 1970s, 1980s and 1990s, as revealed by the fact that it changed from a low-income country to a middle-income country. However, the environmental dimension of development was not considered, mainly because of the early focus on development priorities described above. Initially the government did not consider the impact of development on the environment. The business-as-usual conventional economic development model adopted by Indonesia raised the level of economic goods and services, but was far from environmentally and socially sustainable. Figure 8.1 indicates the current status of development in Indonesia. The ESE triangle forms the base of the triangular pyramid; the apex represents the maximum possible level of each parameter – economic, social and environmental. The shaded area represents Indonesia's current approach to development, with the greatest emphasis on economic parameters and the least emphasis on social and environmental parameters.

*Figure 8.1 The ESE triangle: Indonesia's economic, social and environmental development performance*



In 1972 Indonesia participated in the United Nations Conference on the Human Environment, in Stockholm, Sweden. The conference took place in an international setting where fresh aid was difficult to obtain from the developed countries. The 'Group of 77', consisting of developing country representatives in the United Nations, campaigned for a 'new international economic order' based on an unconditional aid target for developed countries of 0.7 per cent of GDP. But the focus of discussion soon shifted to the 'conditionality of aid', with developing countries viewing the issue of the environment as a disguised method by which developed countries could impose new conditions on developing countries. Developing countries asked why environmental issues had not been raised when pollution first became an issue for developed countries, why developed countries preached messages about actions they had not themselves implemented, and why developing countries were now being asked to bear the burden of environmental cost.

Nonetheless, the conference prompted the Indonesian government to explore how environmental considerations could be applied in the country's five-year development plans (Repelita). Progress was slow for a number of rea-

sons, but particularly because of the lack of good governance – a lack that continued to allow such practices as illegal logging. Sustainable development cannot be achieved without good governance, but good governance requires a participatory democracy in which civil society is actively involved in consultation, deliberation and joint decision-making with government and the business community. This kind of participatory democracy was lacking in Indonesia for more than three decades. During the 30 years of President Soeharto's regime, new generations emerged with new demands. People wanted more democratic freedoms rather than continued authoritarian rule; more decentralisation rather than rigid centralisation; a more transparent, rules-based economy rather than a closed, crony-based economy; more democracy with a participatory approach rather than iron-fisted rule with a top-down approach; and good governance rather than poor governance based on corruption, collusion and nepotism.

Indonesia has now entered a new era of democracy and decentralisation. This change is leading to a more balanced economic, social and environmental development model in which civil society, the business community and 'clean' government are able to play a greater role. The main question now is what Indonesia must do to achieve a balance in its economic, social and environmental development.

## **FUTURE SCENARIOS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT**

In this section, we outline several alternative development scenarios for Indonesia and describe some policies that can be expected to achieve a better balance in the ESE triangle and lead the country towards a path of sustainable development. The scenarios are developed to provide a better understanding of the numerous linkages between the resource-based sectors and the rest of the economy. These insights may help policy-makers anticipate the positive and negative effects – both direct and indirect – of their decisions, leading to policies that promote greater real economic diversification and that both broaden and strengthen the sustainable basis for development.

In generating future scenarios under different assumptions for the rate of resource depletion in Indonesia, we employ a dynamic computable general equilibrium (CGE) model.<sup>7</sup> We focus on three critical areas of economic activity: food; mining; and primary non-food products (mainly forestry and fisheries). In each of these areas, the country faces substantial challenges if it is to reconcile past and current resource use with sustainable growth objectives.

Our scenarios are based on two main premises. The first is that the primary sector will continue to be an important component of GDP in the foreseeable future, ensuring that the sustainability of resource-intensive activities will

remain an essential issue for policy-makers. The second is that the critical link between resource depletion/degradation and sustainable growth works through changes in the productivity of different sectors.

Indonesia's abundant natural resources may soon be exhausted if there is no concerted effort to stop irresponsible exploitation. In the food sector, the present patterns of land and agrochemical use are reducing long-term soil productivity and crop resilience. In the mining sector, the country faces declining total reserves and volatile price trajectories. And in the non-food primary production sector, both forestry and fishery resources are seriously threatened by over-exploitation. In each of these sectors, the extent to which resource depletion will prevent sustainable economic development will generally depend on the relative size of the sector and its linkages to the rest of the economy.

We generate five scenarios of resource depletion towards 2020, using a dynamic CGE model. The different scenarios reflect differences in productivity change in the food, mining and primary non-food sectors. We analyse the consequences of each scenario by comparing the simulation results with those generated under a baseline scenario. Figure 8.2 shows trends for real GDP under the six scenarios we now outline.

*Baseline scenario.* In this scenario we assume that GDP will grow at 5 per cent per annum between 2000 and 2020. Total factor productivity (TFP) in the food, mining and primary non-food sectors is assumed to be constant at the 2000 level. This scenario represents the situation where government, civil society and business stabilise resource utilisation in each sector at 2000 levels. However, we must remember that Indonesia will not achieve sustainable development in these circumstances.

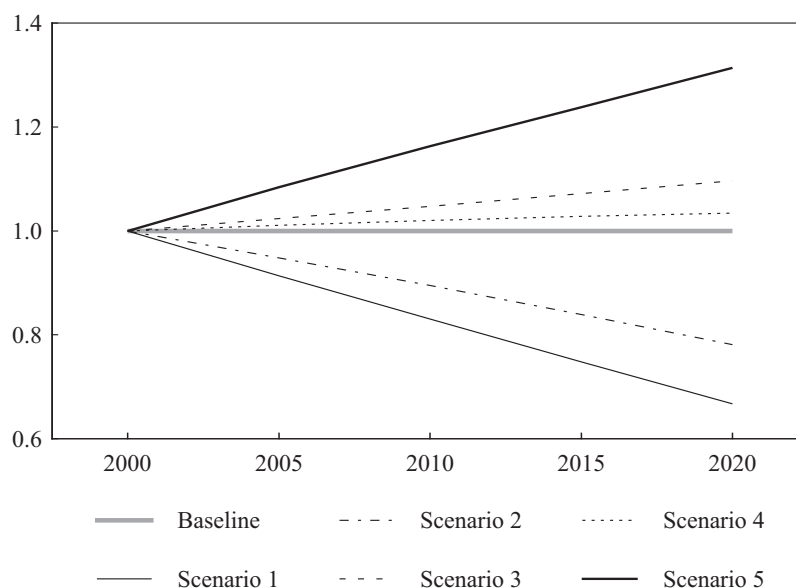
*Scenario 1 (worst-case scenario).* In this scenario, we assume that there is an increase in resource utilisation in the food, primary non-food and mining sectors throughout the 2000–20 period, with TFP in the three sectors declining at an annual rate of 1.5, 2.0 and 2.5 per cent respectively. The scenario is intended to depict the opportunity cost of government failure to recognise sustainability as a generalised policy objective over the next 20 years. The results demonstrate the devastating consequences of doing nothing to improve the sustainability of resource use.

*Scenario 2.* This scenario assumes that in the food and primary non-food sectors the pattern of resource utilisation remains the same as in 2000 but that unsustainable mining activities continue and the productivity of the mining sector declines by 2.5 per cent annually. This could be an underestimate of declining productivity, but we take into account the fact that technological advances may lead to greater productivity in some subsectors.

*Scenario 3.* In this scenario, we assume that in the mining and primary non-food sectors the pattern of resource utilisation remains the same as in 2000, with TFP also remaining the same as in 2000, but that the government intro-



Figure 8.2 Trends in real GDP, 2000–20 (2000 = 1)



duces an environmentally friendly agricultural policy that leads to better productivity in the food sector, whose TFP rises monotonically by 1.5 per cent per annum over the reference period. This is similar to a scenario developed by Resosudarmo (2001).

*Scenario 4.* In this scenario, we assume that in the food and mining sectors the pattern of resource utilisation is maintained at 2000 levels but that government policy fosters a more integrated development of biological resources by promoting investment, improving productivity in sustainable forest products, developing coastal fisheries, and undertaking other innovative activities designed to promote and use Indonesia's tropical habitats in a sustainable manner. This scenario describes the situation where there is a focus on high value-added subsectors, for example by shifting to innovative, biodiversity-intensive products in the forestry sector and by investing in more sustainable fishery activities such as aquaculture. Under such a policy, the productivity of the primary non-food sector could rise by 2 per cent annually.

*Scenario 5 (best-case scenario).* In this scenario, we assume that Indonesia makes a special effort to prevent the unsustainable utilisation of resources. In such circumstances, there is an increase in TFP for all resource-based sectors between 2000 and 2020, of 1.5 per cent for the food sector, 2.0 per cent for the primary non-food sector and 2.5 per cent for the mining sector.

The results of the modelling of trends in real GDP shown in Figure 8.2 provide some interesting insights. In the long run, unsustainable resource utilisation (scenarios 1 and 2 and the baseline scenario) results in slower growth than would occur with better patterns of resource utilisation such as those depicted in scenarios 3, 4 and 5. The adverse effects of resource depletion are significant in every sector, but their precise nature varies according to demand responses. For example, in the mining sector progressively higher extraction costs undermine profits and output to a relatively greater extent because of more elastic export demands than in the food and primary non-food sectors, which have large sales shares in the domestic market and are therefore less severely affected.

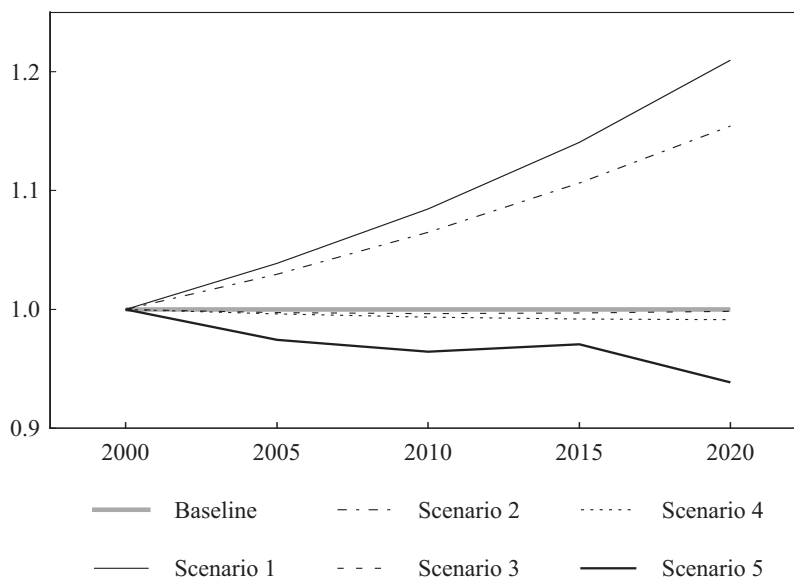
As expected, unsustainable resource use in all resource-based sectors (scenario 1) results in the lowest GDP (more than 30 per cent lower than the baseline GDP in 2020). Different scenarios of resource depletion show different impacts mainly because of changes in TFP. When a sector's TFP increases because resources are better used or decreases because there is a deterioration in the pattern of resource utilisation, there is a significant effect on the long-term trend of value-added in that sector.

Figure 8.2 shows that the most dramatic shortfalls in GDP occur when there is a deterioration in the utilisation of non-renewable resources (scenario 2). This situation is to be expected because of the historical significance of Indonesia's oil sector. The result highlights the importance of another aspect of sustainable development policy: the need for economic diversification and the development of non-primary resources. Continued growth that is leveraged on external markets will require continuing diversification and the continuing development of non-primary resources such as human capital.

From Figure 8.2, we can also see (scenarios 3, 4 and 5) an asymmetry in the impact of resource depletion and resource improvement in the mining sector. Although, as mentioned above, resource depletion in this sector would drag GDP down more than resource depletion in the food and primary non-food sectors,<sup>8</sup> this is not the case under the productivity improvement scenarios, because GDP will increase more when productivity improvement occurs in the food and primary non-food sectors. In the short and medium run, the mining sector might stay on target because of the important foreign exchange its activities earn. However, the sector generally acts as an enclave, with minimal linkages to the rest of the economy, so a forward-looking government should not give it prominence in policy development.

Sustainable utilisation of resources in Indonesia's food production would generate higher GDP, and so would the sustainable utilisation of resources in the primary non-food sector. The assumed annual percentage improvement of productivity in the food sector is lower than in the primary non-food sector (1.5 per cent versus 2 per cent), but the resulting GDP is higher under the improved food productivity scenario.

Figure 8.3 Trends in the price index, 2000–20 (2000 = 1)

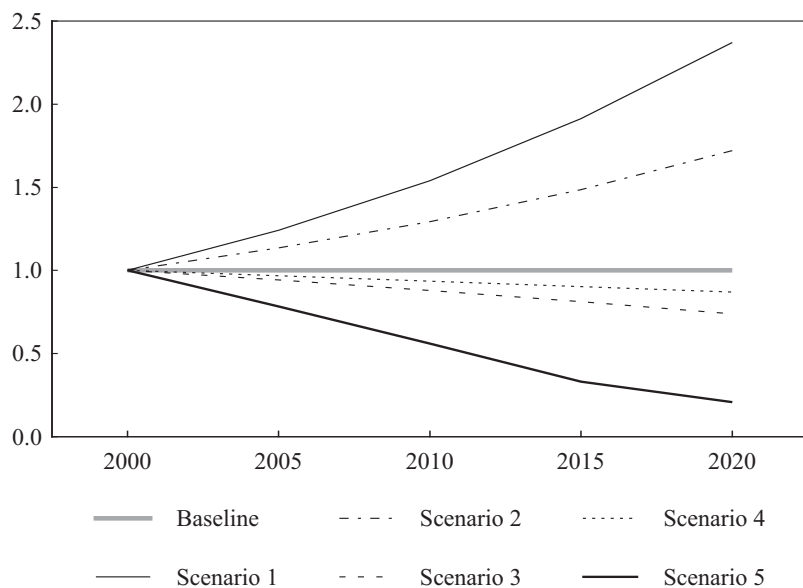


Under the most ideal scenario (scenario 5), GDP would be approximately 30 per cent higher than for the baseline scenario. This is the case despite the fact that in scenario 5 we use a rather conservative estimate of productivity improvements in resource-based activities. Scenario 5 shows how Indonesia's enormous biological potential can be realised through innovative approaches to resource development and use, including the use of new technologies.

Environmentally sustainable production also has a favourable effect on inflation, as shown in Figure 8.3. Under scenarios 3 and 4, the inflation rate is lower – albeit slightly – than under the baseline scenario. The impact is stronger – about 6–7 per cent lower inflation – when more sustainable production is assumed for all resource-based sectors (scenario 5).

Figure 8.4 shows trends in the current account deficit under different scenarios. Unsustainable resource utilisation (scenarios 1 and 2 and the baseline scenario) has a heavy impact on trade, with a direct reduction in export capacity and thereby a decrease in import purchasing power. In the food and primary non-food sectors, resource depletion and productivity growth have a smaller effect on the current account than in the mining sector because the latter is more export-oriented. Thus, unsustainable mining could have a more devastating long-term effect on the country's balance of payments than other unsustainable activities (scenario 2). Scenarios 3 and 4 capture the extent of untapped export

Figure 8.4 Trends in the current account deficit, 2000–20 (2000 = 1)

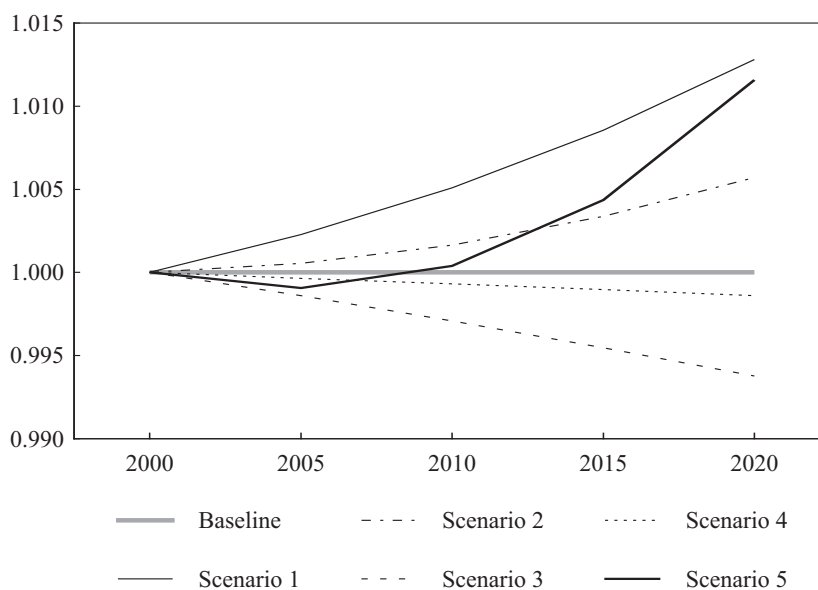


potential in the country's food and primary non-food sectors, including biotechnology-intensive and sustainable high-value forest and fishery products. However, technology requirements for these products are also high, so imports will increase and the relative size of the current account deficit is likely to be lower than in the baseline scenario.

Nonetheless, when production in all resource-based sectors is unsustainable, the current account deficit can be as much as 130 per cent of that under the baseline scenario (Figure 8.4, scenario 1). On the other hand, with continued productivity improvement in all resource-based sectors, the current account deficit could be 70 per cent lower than in the baseline scenario (Figure 8.4, scenario 5). It is clear that the economy's capacity to earn foreign exchange would be undermined by unsustainable resource use.

Producing and exporting higher value-added and processed resource products not only raises dynamic efficiency and provides more foreign exchange, but also reduces the rate of resource depletion and offers other environmental benefits. In the case of forest products, for example, higher value-added production improves the dynamic efficiency of milling activities and thus stimulates exports; at the same time it limits the rate of deforestation, with benefits for biodiversity conservation, water catchment management, erosion control, flood control and wildlife habitat management (Goodland and Daly 1996).

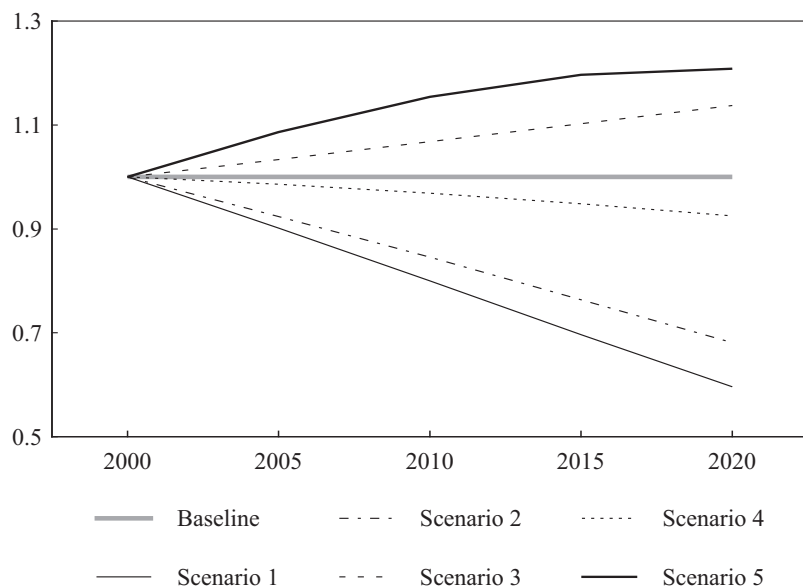
Figure 8.5 Trends in the Gini index, 2000–20 (2000 = 1)



Unfortunately, the promotion of such a policy is not without challenges, especially from the world trading system. For example, developed countries may impose high import duties on processed products and low import duties on raw materials. It is a fact of life in the global world that developing countries seem doomed to be suppliers of raw materials, with all the implied pollution and depletion of non-renewable resources, while developed countries enjoy higher value-added, higher employment and higher income. In this way, the widening gap between the developed and developing countries is perpetuated.<sup>9</sup>

Salim (1993) discusses the link between the environment and the distribution of income. Our simulations indicate that sustainable production has a positive social impact. To better understand the linkages between distribution and development policies, we revisit the six scenarios described above and look at their distributional consequences. Figure 8.5 shows trends in the Gini index as an indication of income equality. In the food, mining and primary non-food sectors, resource depletion (scenarios 1 and 2 and the baseline scenario) worsens the income inequality index. Under scenarios 3 and 4, income is more equally distributed as indicated by the Gini index. However, the ideal scenario (scenario 5) does not produce the most favourable distribution of income; rather, in 2015–20 the index is even higher than that under the baseline scenario. The main reason

Figure 8.6 Trends in employment, 2000–20 (2000 = 1)



is a change in the circumstances of high-income households, which receive the most revenue from the mining sector.

Figure 8.6 shows employment trends under the different scenarios. Like the GDP trends discussed above, they are generally positive for all sectors. However, there is a difference between food and primary non-food sectors. In the latter, improved productivity is likely to be accompanied by a greater use of technology and a reduced requirement for labour-intensive activities. Thus, in the primary non-food sector a more sustainable use of resources will create fewer new jobs than under the baseline scenario. By contrast, more sustainable food production is likely to be accompanied by an increase in employment. Figure 8.6 shows that, when combined with more sustainable mining operations, productivity improvements in the food and primary non-food sectors create some 12 per cent higher employment than under the baseline scenario.

Figure 8.7 depicts trends in the poverty line under the six different scenarios of resource depletion; Figure 8.8 shows the resulting incomes of the poor. From Figure 8.7 it is clear that the sustainable utilisation of resources (scenarios 3, 4 and 5) is likely to result in a poverty line that is roughly 16 per cent lower than that in the baseline scenario. Figure 8.8 confirms that the sustainable use of resources results in higher incomes for the poor than the other scenarios. In other words, the sustainable use of resources will result in a lower incidence of poverty than the unsustainable resource depletion scenarios.<sup>10</sup>

Figure 8.7 Trends in the poverty line, 2000–20 (2000 = 1)

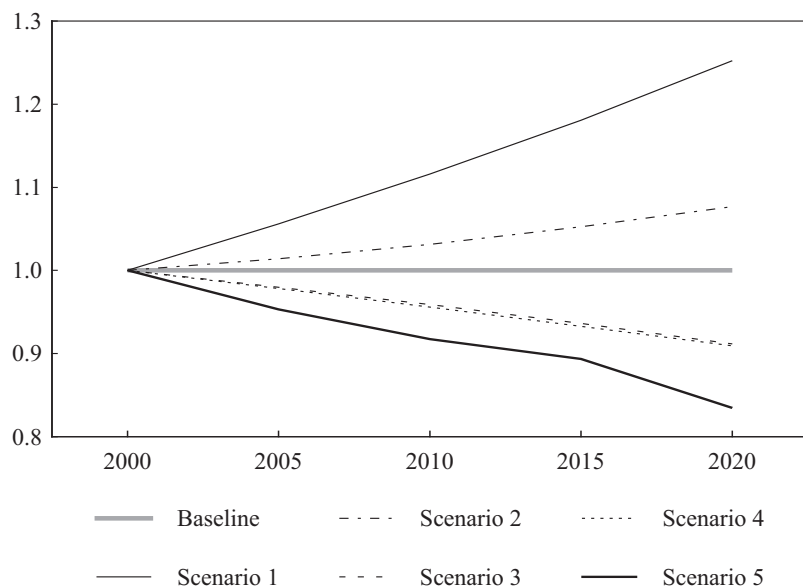
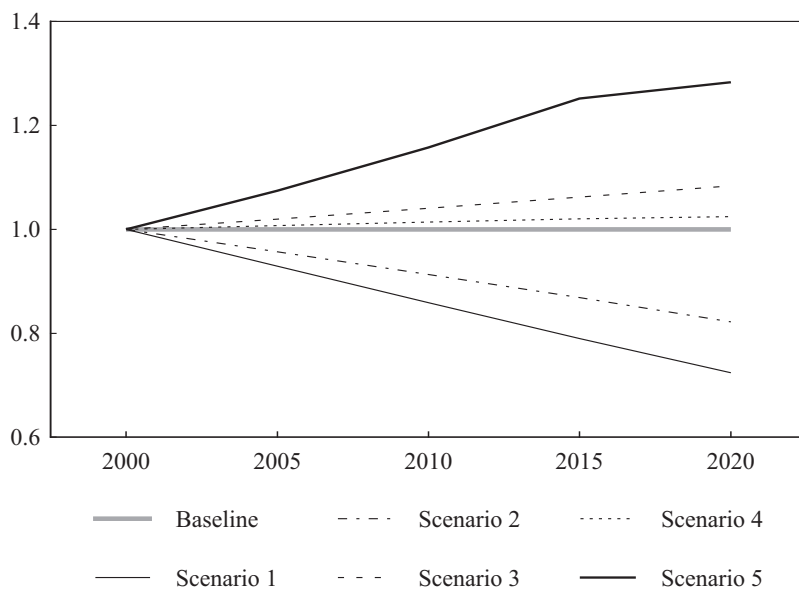


Figure 8.8 Trends in incomes of the poor, 2000–20 (2000 = 1)



Our simulation results clearly indicate that unsustainable resource depletion can have substantial long-term costs. Even if Indonesia maintains 5 per cent annual growth (the baseline scenario), the benefits will be undermined significantly if resources decline in any or all of the three sectors being considered. On the other hand, the benefits of sustainable utilisation are enormous. Direct investment in the resource sector is likely to result not only in a substantial growth dividend but also in better social conditions. Thus the conditions for sustainable development as defined at the beginning of this chapter are satisfied.

## CONCLUSIONS

Over the last three decades, the Indonesian economy has grown at a relatively steady rate of more than 6 per cent annually, a performance on par with that of the East Asian economies. But the environmental dimension of development has been neglected, and many economic policies and decisions have been adopted without regard to environmental considerations. There have been some improvements in the social sector, but they too have lagged behind economic achievements. We strongly believe that Indonesia needs to balance the economic, social and environmental components of the development triangle. Increased resource depletion and degradation have been at odds with economic progress and have resulted in unsustainable growth and development. The 1997–98 financial crisis intensified the risks of greater environmental degradation and a deterioration in social conditions, including social conflicts.

Indonesia is confronted with remarkable challenges and opportunities. The main challenge is to reconcile the interests of a diverse electorate in a more democratic system while crafting and implementing an economic program that can raise living standards for present and future generations. By developing alternative scenarios of resource depletion using a dynamic CGE model, we identify programs and strategies that are consistent with sustainable development. One of the principal lessons of our analysis is the importance of systemic linkages and indirect effects. The sum total of these routinely exceeds (and sometimes can contradict) the direct effects that motivate particular policies. However, indirect effects are quite difficult to anticipate with intuition or partial analysis.

Our simulations reveal that, if Indonesia is to make the transition from a low-income primary exporter to a mature and diversified economy, it must reduce resource exploitation, invest in resources and increase long-term productivity. Productivity improvement will be a critical strategy for the country's future development. The simulations presented in this chapter demonstrate that such a strategy would greatly improve not only economic objectives but also



social conditions and environmental efficiency. In this way, Indonesia will have a more balanced ESE triangle. Planning and implementing such a strategy will be daunting and is likely to involve many trade-offs, but there is no realistic alternative if the country is to achieve sustainable development.

## NOTES

- 1 At the time Indonesia was suffering under huge foreign debt. This situation was satisfactorily settled using a formula developed by Dr Abs, a famous German banker, and approved by the Inter-Governmental Group on Indonesia, an aid consortium that became the Consultative Group on Indonesia in the 1990s.
- 2 Under the CoW, Pertamina gained monopoly control over oil at the point of oil exploitation. It also collected oil taxes on behalf of the state and took care of the needs of foreign contractors. With a relatively weak government fiscal administration, Pertamina quickly became a major political and economic power centre that obsessively advocated high-technology industrial development.
- 3 The negative impact of the Freeport mining operation was particularly felt by the indigenous people, the Amungme and the Kamoro in the Timika area. This is to be contrasted with the United Nations Draft Declaration on the Rights of Indigenous Peoples (Article 30) which recognises indigenous peoples' right to

determine and develop priorities and strategies for the development or use of their lands, territories and other resources, including the right to require that States obtain their free and informed consent prior to the approval of any project affecting their lands, territories and other resources, particularly in connection with the development, utilisation or exploitation of mineral, water or other resources. Pursuant to agreements with the indigenous peoples concerned, just and fair compensation shall be provided for any such activities and measures taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.

A smaller-scale example is Aurora Gold's PT Indo Muro Kencana mine in Central Kalimantan, an Australian goldmine that has often been embroiled in conflict with the indigenous Dayak community.

- 4 Named for the paradoxically adverse effects experienced in the Netherlands after the discovery of North Sea gas, the Dutch disease refers to the rise in currency values, fall in manufactured exports and increase in imports that may accompany the discovery and exploitation of a natural resource.
- 5 It is widely recognised that economic activities that add value to natural resources also provide diverse occupational opportunities, relatively high-wage jobs and a stable economy that is relatively unsusceptible to boom-bust cycles; such activities are consistent with a balanced ESE triangle.
- 6 An official at the Office of the State Minister of the Environment recently warned that in the last decade Indonesia has lost one species a day and that 70 per cent of the original habitat of those species has been destroyed. Unless urgent action is taken, these losses in biodiversity will continue at the same rate in the future.

- 7 A CGE model, in general, is a mathematical system of equations that represents the behaviour of all agents (consumers and producers) and the market-clearing conditions of goods and services in an economy. The model we use is fairly comprehensive, linking the real sector and resource block, trade block, financial block and distributional poverty module. It is updated from Azis and Roland-Holst (1999) and Azis (2000, 2002).
- 8 This is not just because of the assumed larger percentage decline in mining productivity. Results of several trials using different percentage figures do not change the general conclusion.
- 9 The tragedy of today's global economy is that the World Bank, the International Monetary Fund (IMF) and the World Trade Organization (WTO) cannot make substantial changes, since such changes would not meet the interests of developed countries. In each institution, a board of executive directors makes decisions on the basis of 'one dollar, one vote'; the boards consist mainly of representatives from rich developed countries that contribute large sums to increase the size of their vote.
- 10 The importance of the linkage between resource depletion and poverty has been widely documented. EIR (2003) provides one good elaboration of the link.