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Asian Development Bank (ADB)
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Vietnam Development Report 2011

Natural Resources Management

Vietnam Development Report 2011

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Joint Development Partner Report to the Vietnam Consultative Group Meeting
Hanoi, December 7-8, 2010

Vietnam Development Report 2011

Natural Resources Management

Photos by:

Nghiem Thi Xuan Le
Nguyen Hong Ngan
Nguyen Quang Tuan

Joint Development Partner Report to the Vietnam Consultative Group Meeting
Hanoi, December 7-8, 2010

IBRD 33511R1

VIETNAM

- PROVINCE CAPITALS
- NATIONAL CAPITAL
- RIVERS
- MAIN ROADS
- RAILROADS
- PROVINCE BOUNDARIES
- INTERNATIONAL BOUNDARIES

PROVINCES:

1 Lai Chau
2 Dien Bien
3 Lao Cai
4 Ha Giang
5 Cao Bang
6 Son La
7 Yen Bai
8 Tu Yen Quang
9 Bac Can
10 Lang Son
11 Phu Tho
12 Vinh Phuc
13 Thai Nguyen
14 Bac Giang
15 Quang Ninh
16 Ha Noi
17 Bac Ninh
18 Hung Yen
19 Hai Duong
20 Hai Phong
21 Hoa Binh
22 Ha Nam
23 Thai Binh
24 Ninh Binh
25 Nam Dinh
26 Thanh Hoa
27 Nghe An
28 Ha Tinh
29 Quang Binh
30 Quang Tri
31 Thua Thien Hue
32 Da Nang
33 Quang Nam
34 Quang Ngai
35 Kon Tum
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43 Lam Dong
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56 Vinh Long
57 Tra Vinh
58 Kien Giang
59 Can Tho
60 Hau Giang
61 Soc Trang
62 Bac Lieu
63 Ca Mau

JANUARY 2010

VIETNAM GOVERNMENT FISCAL YEAR
January 1 to December 31

CURRENCY EQUIVALENTS
(Exchange Rate Effective September 20, 2010)

Currency Unit = Vietnamese Dong (VND)
US$ 1.00 = VND 19, 495.00

Weights and Measures
Metric System

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AOM	Air Quality Management
BTNMT	Vietnamese abbreviation for Ministry of Natural Resources and Environment
AusAID	Australian Agency for International Development
CAI	Clean Air Initiative
CAIT	Climate Analysis Indicators Tool
CBDRM	Community Based Disaster Risk Management
CDA	Community Development Agreement
CECOD	Center for Environmental and Community Development
CEPF	Critical Ecosystem Partnership Fund
CFM	Community Forest Management
CIEM	Central Institute for Economic Management
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CSR	Country Synthesis Report
CSR	Corporate Social Responsibility
DANIDA	Danish International Development Agency
DECAFIREP	Department of Capture Fisheries Exploitation and Protection
EC	European Commission
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIA	Environment Investigation Agency
EITI	Extractive Industries Transparency Initiative
EIU	Economist Intelligence Unit
EPI	Environmental Performance Index
EU	European Union
FAO	Food and Agriculture Organization
FoE	Friends of the Earth International

FLEGT	Forestry Law Enforcement, Governance and Trade
FOMIS	Forest Information Management System
FSC	Forest Stewardship Council
FSPS	Fisheries Sector Programme Support
GDLA	General Department of Land Administration
GDP	Gross Domestic Product
GHG	Green House Gases
GNI	Gross National Income
GOV	Government of Vietnam
GSO	General Statistics Office
GTZ	German Agency for Technical Cooperation
ICZM	Integrated Coastal Zone Management
ICEM	International Centre for Environmental Management
IDMC	Irrigation and Drainage Management companies
IPCC	Intergovernmental Panel on Climate Change
ISF	Irrigation Service Fee
ISPONRE	Institute of Strategy and Policy on Natural Resources and Environment
ITTO	International Tropical Timber Organization
IUU	Illegal, Unreported and Unregulated
IWRM	Integrated Water Resource Management
JICA	Japan International Cooperation Agency
KECO	Korean Environment Corporation
KIET	Korean Institute for Industrial Economics and Trade
LASUCO	Lam Son Sugar Joint Stock Corporation.
LROs	Land Registration Offices
LURCs	Land Use Right Certificates
MARD	Ministry of Agriculture and Rural Development
MEY	Maximum Economic Yield
MoH	Ministry of Health
MoIT	Ministry of Industry and Trade
MoNRE	Ministry of Natural Resources and Environment
MoST	Ministry of Science and Technology
MPA	Marine Protected Areas
MPI	Ministry of Planning and Investment
MQI	Mining and Quarry Industry
MRC	Mekong River Commission
MRV	Monitoring, Reporting and Verification
MSC	Marine Stewardship Council

MSY	Maximum Sustainable Yield
NFI	National Forest Inventory
NFIMP	National Forest Inventory and Monitoring Program
NPOA	National Plan of Action
NORAD	Norwegian Agency for Development Cooperation
NTP	National Target Program
NTP-RCC	National Target Program to Respond to Climate Change
PEMSEA	Partnership in Environmental Management for Seas of East Asia
PFES	Payment For Forest Environment Service
PPPs	Public Private Partnerships
QCVN	Quy Chuan Viet Nam or National Regulation of Vietnam
REDD	Reduced Emissions from Deforestation and Forest Degradation
SEA	Strategic Environmental Assessment
SEDP	Socio-Economic Development Plan
SFEs	State Forest Enterprises
SFCs	State Forest Companies
SOE	State Owned Enterprises
SUF	Special-Use Forest
UN	United Nations
UNESCAP	UN Economic and Social Commission for Asia and the Pacific
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VDR	Vietnam Development Report
VIMICO	Vietnam National Minerals Corporation
VINACOAL	Vietnam National Coal Corporation
VINACOMIN	Vietnam National Coal-Minerals Industries Corporation
VINAFOR	Vietnam Forest Corporation
VHLSS	Vietnam Household Living Standards Survey
VIFEP	Vietnam Institute of Fisheries Economic and Planning
VND	Vietnamese Dong
VPA	Voluntary Partnership Agreement
WCMC	World Conservation Monitoring Center
WSR	Water Sector Review
WTO	World Trade Organization
WWF	World Wide Fund for Nature

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The Vietnam Development Report (VDR) is a joint development partner report. It aims to inform the reform agenda of the government of Vietnam and to harmonize development partner support for this framework. Therefore the emphasis is not so much on background description as it is on a discussion of the way forward.

The current VDR is one in a long series of annual reports addressing the most important development topics of Vietnam. They do so against the backdrop of the Socio-Economic Development Plan, which lays out the government's broad development agenda.

The theme of this VDR is natural resources management. The main question that the VDR poses is: ***How can natural resources be used efficiently to promote robust economic growth and alleviate poverty in a manner that is environmentally and socially sustainable***? An examination of that question entails addressing several subthemes that run through the different chapters. The report is organized to address the lead themes of efficiency, environmental sustainability, and equity in sectoral chapters on land, water, forests, marine resources, and mineral resources. The first chapter provides a broad overview connecting the sectoral chapters. A statistical annex provides further data in support of the text.

The VDR is the result of a consultative process involving not only development partners but also nongovernmental organizations, academics, researchers, and independent consultants. The process has been coordinated by the World Bank.

The Big Picture

Vietnam has enjoyed two decades of strong economic growth, and the nation reached the status of "lower-middle-income country" in 2009. Aligned with that economic growth is a sharply declining poverty rate. Government policy provides for a transition from a centrally planned economy toward one that is increasingly market-oriented, with a socialist orientation. Part of this is a process of devolution of decision making to lower levels of government. Aggregate population growth is not high, but people are moving rapidly into urban centers and leaving agriculture for industry and services.

Much of the economic growth has been fueled by intense exploitation of natural resources. Utilization of land has intensified, water resources are increasingly stretched, natural forests have been logged, capture fisheries have depleted their resource base, and mineral resources are

increasingly exploited. There is nothing wrong with using natural resources for economic growth. But sustainable development requires that renewable resources be harvested at a level that allows for replenishment, and that the proceeds from exploitation of nonrenewable resources are invested in other forms of capital. More-intense utilization will also bring about more competition and even conflict over resources. This will increase the need for clear property rights, rules of transactions, and conflict resolution.

The overall growth of the economy, population growth, urbanization, and industrialization are all combining to increase water pollution, urban air pollution, and the extraction of natural resources. To some extent this is counterbalanced by increasing efficiency in the use of natural resources and technological progress. But the net result is increasing pressures on the resource base and pollution. In many cases the benefits will be registered by way of economic growth but the costs will be "hidden" as poor human health, longer-term losses of ecosystem productivity, and reduced environmental quality.

Climate change stresses require adaptation measures. Much about the long-term impacts of climate change is uncertain. But enough is known already to prompt action: temperatures will increase, the sea level is rising, and saltwater intrusion will increase further. Precipitation is likely to exacerbate droughts and floods, and it is likely that extreme climate events will become more frequent and intense, while the current level of impact is quite significant and warrants countermeasures.

Vietnam operates in an international context. The entire economy is increasingly integrated into the global system, particularly since joining the World Trade Organization in 2006. Most of Vietnam's surface water resources come from outside the country. Vietnam will be affected by the massive hydropower plants being planned in the Mekong River. The wood processing industry of Vietnam is quite strongly import-dependent for raw material. Many of its products are intended for export, and new legislation in those markets is placing new demands on Vietnam. The marine fisheries and aquaculture industries are also very export-oriented, and the former competes with foreign fleets in international waters. Some important marine products export markets will require proof of sustainable resource management in Vietnam. The mining industry is also strongly export-oriented. All these situations strongly affect the reform agenda.

Conclusions on the Reform Agenda

Vietnam is already engaged in a dynamic reform process. This report makes suggestions for reinforcing that momentum. Vietnam's recent history is one of successful economic reform. Sometimes the goals of efficiency, environmental sustainability, and equity are quite compatible—witness the growth pattern combined with poverty alleviation. But there are also trade-offs between these goals. In particular, economic growth that puts a "zero price" on environmental impacts will send markets and decision makers the wrong signals and therefore undermine the benefits of development. Efficient markets may not produce results that are acceptable from an equity perspective, and so on. Thus reforms have to be pursued with an eye to multiple and sometimes competing goals. There are also important gaps between theory and practice that need to be addressed. Good policies require adequate resources for successful implementation.

In very broad terms, the reform agenda for natural resources management suggested by the VDR involves:

- A focus within public management on enhanced data gathering, analysis, and public dissemination to support functioning markets as well as efficient public decision making and coordination. This will contribute to efficiency, environmental sustainability, and equity. Priorities in the short term include: enhanced public transparency in land markets; improved water data collection to underpin rational watershed management under increasing competition for water; stringent data standards in forestry to allow for international transfers in support of carbon sequestration, sustainable forestry, and biodiversity conservation; an improved database to determine the status of marine fisheries and hence reasonable catch levels; and public disclosure of the results of environmental assessments of the impacts of mineral exploitation.
- Assignment of clear and more-secure long-term property rights and an increase in the use of market prices to provide incentives for investment, growth, and decentralized solutions. This is fundamental for greater efficiency. Short-term priorities to enhance efficiency include: modernizing land administration to lower transaction costs, improving irrigation efficiency, raising the yield in forest plantations, reforming marine subsidies so as not to encourage overexploitation of these resources, and creating more enabling conditions for the private sector to pursue opportunities in the minerals sector.
- Enhancing environmental regulatory implementation to close the gap between theory and practice; assigning values to the environment where markets fail to do so; scaling up of co-management schemes in forestry and marine resources and of payments for environmental services; and integrating climate change into public planning. These are fundamental to environmental sustainability. Short-term priorities from an environmental perspective include: land use planning to protect critical habitat; vigorous implementation of regulations to combat water pollution; scaling up of systems for payments for forestry protection and expansion in coastal areas; expansion of the Marine Protected Area system in combination with community-based protection schemes; and enforcement of environmental regulations related to mining.
- Community benefits sharing schemes, fair-market value compensation for property expropriation, improved information access, transparency in governance, and public participation. These are fundamental measures to ensure equity in natural resources management. Short-term priorities include: efficiently and fairly addressing grievances occurring in land markets; targeted improvements in water services for the poor; scaling up of the promising pilots in both community forestry management and marine resources; and provisions for communities to benefit directly from minerals exploitation in their neighborhoods.

CHAPTER 1

NATURAL RESOURCES MANAGEMENT—AN OVERVIEW

Vietnam has enjoyed two decades of strong economic growth, and the nation reached the status of "lower-middle-income country" in 2009. Aligned with that economic growth is a sharply declining poverty rate. Government policy provides for a transition from a centrally planned socialist economy toward one that is increasingly market-oriented. Part of this is a process of devolution of decision making to lower levels of government. Aggregate population growth is not high, but the population is rapidly moving into urban centers and leaving agriculture for industry and services.

The overall growth of the economy, population growth, urbanization, and industrialization are all combining to increase air and water pollution and the extraction of natural resources. To some extent this is counterbalanced by increasing efficiency in the use of natural resource and technological progress. But the net result is increasing pressures on the natural resources base and pollution. In addition, climate change will increasingly add the need for adaptation to sea level rise, salt water intrusion, and changes in precipitation and temperature.

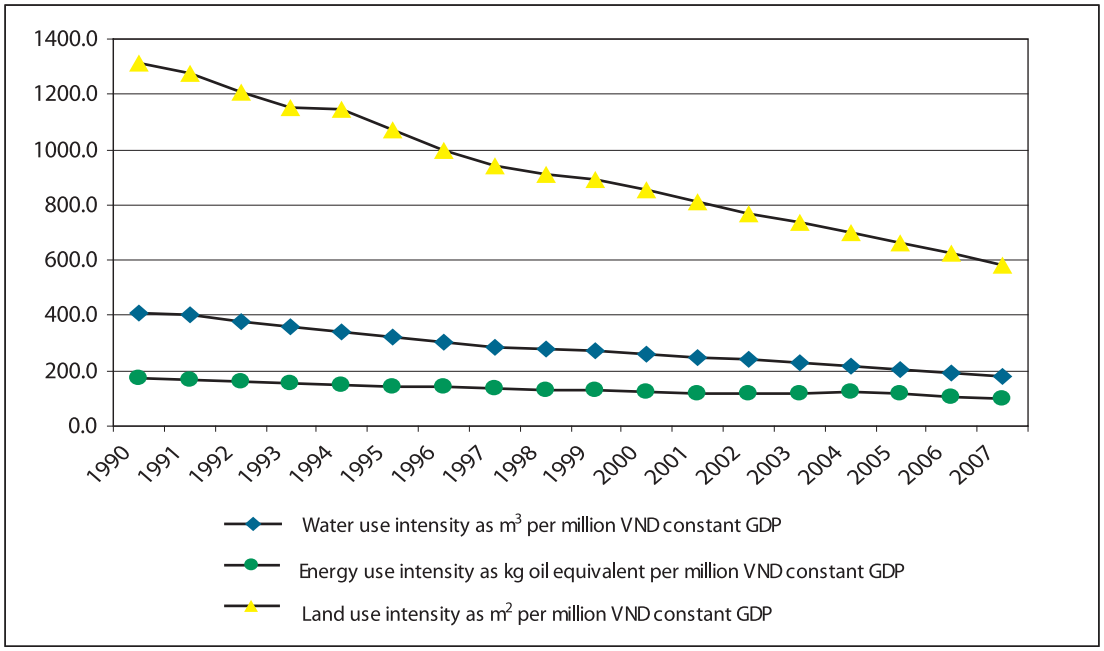
These issues prompt a reform agenda that is outlined in the following chapters, with a focus on three themes: economic efficiency, environmental sustainability, and social equity ("the three Es").Vietnam is already engaged in a dynamic reform process. This report aims to build on and reinforce that momentum. In very broad terms, this reform agenda for natural resources management involves:

- *A public management focuses on better administrative coordination and enhanced data gathering, analysis, and public dissemination to support functioning markets and efficient public decision making. This will contribute to all of "the three Es."*
- *The assignment of clear and more secure long-term property rights and an increase in the use of market prices to provide incentives for investment, growth, and decentralized solutions. This is fundamental for greater efficiency.*
- *Enhancement of environmental regulatory implementation to close the gap between theory and practice; assigning values to the environment where markets fail to do so; scaling up of co-management schemes in forestry and marine resources and of payments for environmental services; and the integration of climate change in public planning. These are fundamental to environmental sustainability.*
- *Community benefits sharing schemes, fair-market value compensation for property expropriation, improved information access, transparency in governance, and public participation. These are fundamental measures to ensure equity in natural resources management.*

Vietnam's economic growth has been spectacular in the last couple of decades, reaching more than $1,000 per capita in 2009.[1] Real growth in the gross domestic product (GDP) was about 8 percent in 2005–08, and this weakened only somewhat in 2009 in spite of the recession. For 2010–11 GDP growth is forecast to 6–7 percent.[2] Along with GDP growth, poverty has fallen drastically—from almost 60 percent in 1993 to about 14 percent in 2008.[3] Inequality increased only moderately during this time.[4]

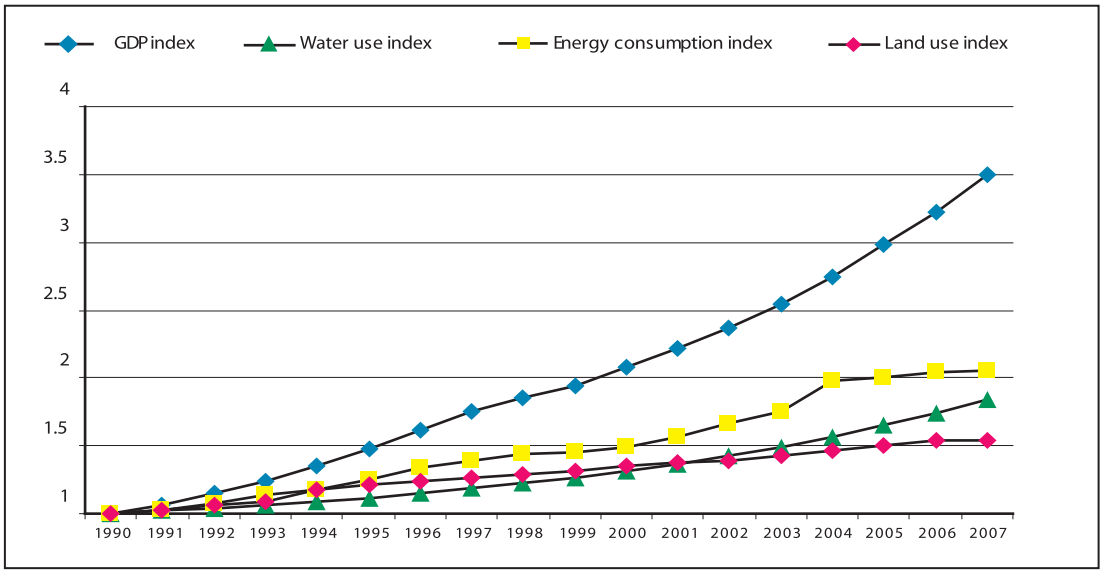
Along with the impressive economic growth, the intensity of use of some basic natural resources such as land, water, and energy to produce one unit of economic output in Vietnam tended to decrease during 1990–2007. In other words, the country tended to use fewer resources to

Figure 1.1. Intensities of resource use, 1990–2007



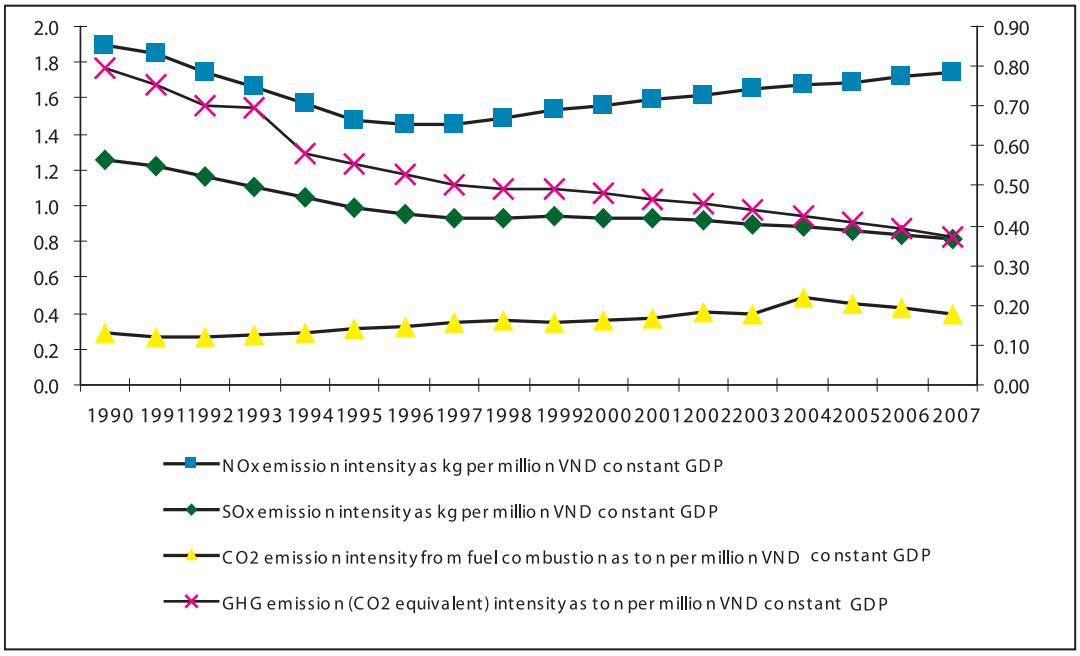
Source: UNESCAP & CIEM 2009.

Figure 1.2. GDP and absolute resource use indexes (1990 =1)



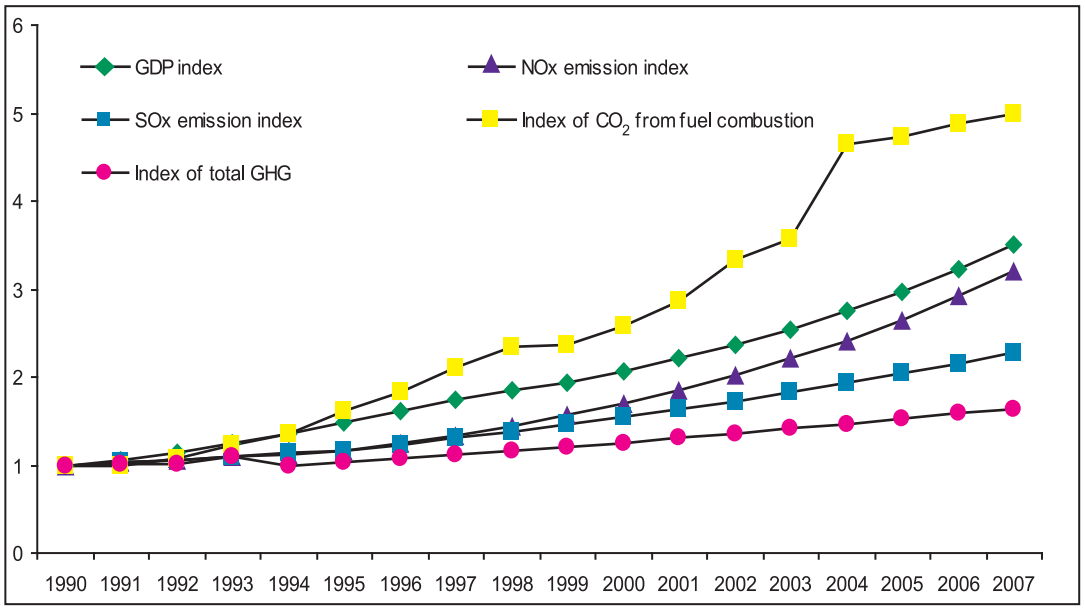
Source: UNESCAP & CIEM 2009.

Figure 1.3. Pollution intensity, 1990–2007



Source: UNESCAP & CIEM 2009.

Figure 1.4. GDP growth and absolute air pollution indexes (1990 =1)



Source: UNESCAP & CIEM 2009.

generate $1 million of GDP (Figure 1.1). This is partially explained by a structural shift from agriculture toward industry and services.[5]

Notwithstanding these signs of increased resource use efficiency, the absolute level of resource use continued to increase (Figure 1.2).

Measures of air pollution intensity show a mixed picture during 1990-2007, but the rapid growth of the economy implies that the absolute levels of pollution are rapidly increasing (Figures 1.3 and 1.4).

The government's Socio-Economic Development Plan (SEDP) 2006–2010 and the draft SEDP 2011–2015[6] detail the transition toward a middle-income country, based on a market economy with a socialist orientation. This development builds on the successes of the renovation process initiated in the late 1980s *(doi moi)* while also preserving the strong poverty-reduction focus. The SEDP sets out four broad objectives: to improve the business environment; social inclusion; natural resources and environment management; and governance. Since the turn of the century, there has been increased reliance on market mechanisms, development of a multi-stakeholder economy, and further integration with the region and the world. For example, Vietnam joined the World Trade Organization (WTO) in 2006. The role of the state sector in manufacturing has declined from more than half in 1995 to about one-third in 2006, as private sector growth has outpaced the state sector.[7]

The population in 2008 stood at about 86 million people, growing at slightly more than1 percent a year.[8] Behind this aggregate are rapid changes in the location and employment of the population. The definition of "rural" and "urban" is somewhat arbitrary and subject to dispute. However, it seems clear that urbanization is progressing rapidly. Official figures show a growth in urban population from 30 percent today to a projected 50 percent by 2025, at an annual growth rate of more than 3 percent, with a likely total of more than 50 million urban residents in 2025.[9] The share of agriculture in GDP declined to 22 percent in 2008, while industry's share reached 40 percent, and services accounted for almost the same share.[10]

Another important social dynamic is decentralization of decision making. *The Vietnam Development Report 2010: Modern Institutions* focused on devolution and accountability—and the reader is referred to that report for an in-depth treatment of this subject.[11] However, it bears recalling here that this process has involved decentralization of decision-making powers to provincial and lower levels of government, administrative and service delivery units, the courts and elected bodies, the media and civil society, and all the way down to firms and farmers. This implies that people who are closer to facts on the ground, and who can adjust with more flexibility to opportunities and changing circumstance, are more empowered. However, there are important counterpoints to the advantages of decentralization. First, lower levels of government may not be able to capture the benefits of, for example, the larger river-basin perspective on efficient allocation of water resources. Second, lower levels of government may come to subsidize an over establishment of, for instance, fishing capacity or a fisheries processing industry based on their local interests. Hence while the overall tendency of allowing more decentralized decision making is beneficial, there are cases where the national interests require centralized management.

Taken together, population growth, urbanization, and industrialization have had significant impacts on the natural environment. The most serious pollution problems arise in and around Ho Chi Minh City and Hanoi. By sector, the most serious water pollution—measured as biological oxygen demand—emanates from the production of textiles and food. Total suspended solids are mainly a product of the furniture and food industries.[12] The pressures on natural resources—agricultural land, natural forests, fisheries, and mineral resources—are also

increasing.[13] This development is also threatening biodiversity in a country with globally significant amounts of it, as nearly 10 percent of the world's mammal and bird species are found in Vietnam.[14]

It should be recalled that Vietnam operates in an international context. The entire economy is increasingly integrated into the global system, particularly since joining the WTO. The links are also quite strong in terms of natural resources management. Most of Vietnam's surface water resources emanate in foreign territory. Vietnam will be affected by the massive hydropower plans under way in the Mekong River. The wood processing industry of Vietnam is quite strongly import-dependent for raw material. In addition, many of its products are intended for export, and new legislation in those markets is placing new demands on Vietnam. The marine fisheries and aquaculture industries are also very export-oriented, and the former competes with foreign fleets in international waters. Again, some important marine products export markets will require proof of sustainable resource management in Vietnam. The mining industry is also strongly export-oriented. As shown in detail in the statistical appendix to this VDR, crude oil—the export value of which swings considerably from year to year—fell to a second place in exports after textiles and garments in 2009. Marine products occupied the third place, followed by footwear, handicraft and electronics. Not far behind were rice and wood products.[15]

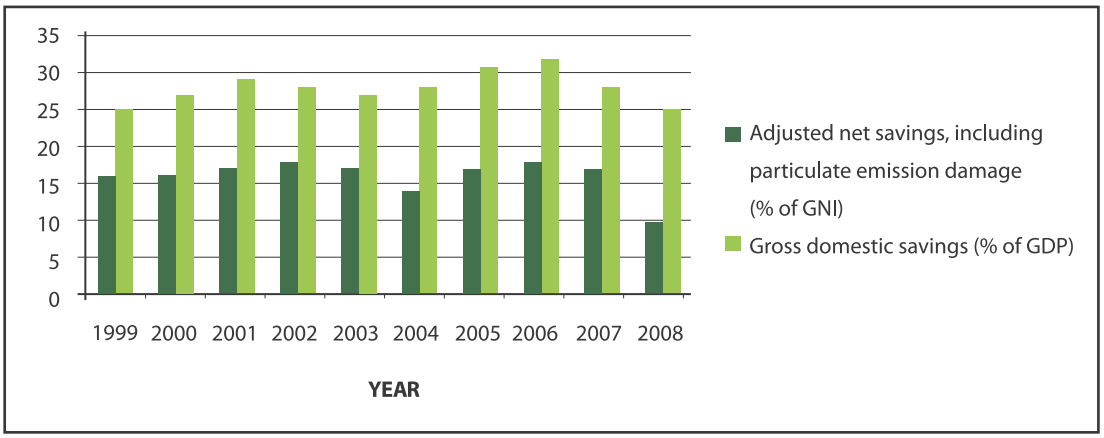
Sustainable Use of Natural Resources

"Sustainable development" has many definitions. An often quoted interpretation is from the World Commission on Environment and Development in 1987, as "… development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[16] But general definitions need to be complemented by specifics on measurements to be of operational use. Is Vietnam's development sustainable? There are several approaches to responding to that question. One is to take an "adjusted net savings" approach.[17] Figure 1.5 summarizes the overall picture by adjusting the traditional savings measure in several ways. It adds the investment of resources in education (as recurrent expenditure), but subtracts for costs for air pollution (the cost of particulate matter damaging human health) and the generation of carbon dioxide that contributes to climate change. It also subtracts the depletion of minerals and forest resources above sustainable yield. The income from them represents the depletion of a resource, not sustainable income.

The result is a large differential between the traditional savings measure (gross savings as percentage of the gross national income (GNI)) and the adjusted savings. Still, net savings are strongly positive at about a 10–17 percent rate of GNI in the last decade. But this can be compared with the level of more than 22 percent for the entire group of lower-middle-income countries to which Vietnam now belongs. The East Asia & Pacific Group shows an even higher adjusted net savings rate, of almost 29 percent. Comparisons can also be made for 2008 with China (35 percent), Indonesia (minus 2 percent, due mainly to considerable energy resources depletion), and 22 percent for the Philippines. Comparisons can also be made with high-income countries for context. For example, the USA shows an adjusted net savings rate of about 1 percent of GNI in 2008 (mainly due to low gross savings), while France registers about 10 percent.[18] The conclusion is therefore that Vietnam does meet this type of "sustainability test" but does not compare well with several other countries in its own income group. However, this picture omits certain aspects, such as depletion of marine resources, degradation in the quality of non-timber forest resources, and the impacts of water pollution. The appropriate adjustments for these factors would vary considerably across countries.

Another approach to measuring environmental sustainability is the Environmental Performance

Figure 1.5. Vietnam: Gross and net savings, 1999–2008



Source: Adapted from World Bank 2010g.

Index (EPI).[19] This measures countries' performance level relative to their established environmental policies targets. There are two core objectives of environmental policy: environmental public health and ecosystem vitality. Under these core objectives, the EPI is based on the weighted scores for 10 policy goals based on their underlying indicators: the environmental burden of disease, water resources for human health, air quality for human health, air quality for ecosystems, water resources for ecosystems, biodiversity, forestry, fisheries, agriculture, and climate change.

Vietnam is ranked eighty-fifth among 163 countries in the 2010 EPI rankings, with a score of 59. Some of the highest-ranking countries are Iceland, Switzerland, and Costa Rica, in decreasing rank order, with 94 being the highest score. Countries with the worst environmental performance are Sierra Leone, Central African Republic, and Mauritania, in increasing rank order, with the lowest score being 32. Regional comparisons can be made with the Philippines (66), Thailand (62), Lao PDR (60), China (49), Indonesia (45), PNG 44), Mongolia (43), and Cambodia (42). Hence, in that comparison, Vietnam does reasonably well.

Vietnam has high scores in some areas like forestry and agriculture. In the former, the score is related to forest cover change and growing stock change, and as discussed in the forestry chapter, Vietnam has invested heavily in reforestation. However, this does not prevent the quality of natural forests from degrading. In agriculture, the score is related to water use intensity in agriculture, subsidies, and pesticide regulations. Vietnam receives much lower EPI ratings in sectors like fisheries, climate change (carbon dioxide (CO_2) emissions per kilowatt-hour, industrial greenhouse gas (GHG) emissions intensity), air pollution effects on ecosystem, and marine protection.

Against this backdrop of overall sustainability concerns and the targets set in the SEDP, the specific theme of this VDR is **natural resources management.** As documented in prior VDRs, there is much progress to note by way of growth and poverty alleviation, but there are also remaining institutional weaknesses that hamper development and diminish the quality of growth. The main question that the VDR poses is therefore: ***How can natural resources be used efficiently to alleviate poverty in a manner that is environmentally and socially sustainable?*** An

examination of that question entails addressing several sub-themes that will run through the different chapters ("the three Es"):

- incentives for *efficient* utilization to promote economic growth
- holistic management for *environmental sustainability*
- community rights, participation, and benefit sharing for social *equity*.

Addressing such broad issues requires a clear structure for the report. This report is focused on a subset of the EPI—natural resources—rather than environmental health, which is dealt with only marginally. The remainder of the report is organized in the three main themes just identified. These are further broken down into five sectoral chapters on land, water, forests, marine, and mineral resources. The choice of sectors is pragmatic: our counterpart institutions tend to be organized along sectoral lines, as is the competence of resource persons. Furthermore, the resources available for the report are limited, and so is the time we have to prepare the report. Not explicitly shown in the figure are some themes that cut across chapters, such as climate change, governance, and institutional analysis.

Several potential topics are not addressed in chapter format, if at all. There is no dedicated chapter on coastal zone management, although the substantive issues pertaining to it—land use planning, sea level rise, salt intrusion, mangrove restoration, and so forth—are discussed in the relevant sectoral chapters. Solid waste is not treated in its own chapter, but it clearly has implications for water pollution, which is discussed as part of the water chapter. Urban air pollution is not yet reaching the same level of concern as water pollution, but it is documented that urban air quality in Vietnam is characterized by high levels of particulate matter, often exceeding annual Vietnam standards and World Health Organization guidelines.[20] The available information about indoor air pollution is insufficient for a treatment here.[21]

Climate Change

A cross-cutting theme that is of relevance throughout this report is climate change. All the chapters include some mention of its relevance. This theme has attracted an enormous amount of attention, and there is an impressive body of recent publications that deal with it.[22] Hence, this report provides only a very succinct overview.

It has been estimated that the cost for developing countries of adaption to climate change is on the order of $75–100 billion per year from 2010 to 2050.[23] This is a large sum, but small in comparison to the size of the economy. More-significant impacts in the very long term cannot be ruled out. But these would have to be viewed in the larger perspective of fundamental social and economic change over such time periods. For Vietnam, a recent national study concluded that the impact of climate change on real GDP by 2050 would be on the order of a 1–3 percent loss compared with the baseline of no climate change. [24]

Climate change will add another complication to natural resource management, increasing over time and involving aspects of mitigation and adaptation. Much is uncertain about the long-term impacts of climate change, but clearly temperatures will rise, perhaps by 2–4°C by the end of this century. The mean sea level rise by 2100 is projected by different sources to be about 18–70 centimeters, and 100 centimeters or more is conceivable in a high-emissions scenario and when considering the effects of land ice melting. Precipitation forecasts differ considerably among models, but annual totals are expected to increase everywhere in Vietnam, with a tendency for drier weather in the dry season in the south and wetter weather in the wet seasons in the north. It is not clear from localized models if the frequency and intensity of cyclones in Vietnam will change, but global analysis suggests that warmer seas are likely[25] to fuel more-intensive typhoons. [26]

Vietnam is not a significant emitter of greenhouse gases in the global perspective. According to the World Resources Institute, Vietnam emitted about 177 million tons of CO_2 equivalents (CO_2e) in 2005, the latest year for which internationally comparable data are available.[27] That put Vietnam at rank 35 in absolute emissions in the world, with about 0.5 percent of the global total. The emissions per capita stood at about 2 tons of CO_2e, which ranked Vietnam one hundred and eleventh in the world. The GHG emissions are expected to increase considerably over time. [28]

Even small emitters can contribute to global efforts to stem climate change through cost-effective mitigation measures that have domestic co-benefits as well, for example due to lower energy costs and reduced air pollution. The global cost of addressing climate change will decrease substantially if all countries join hands in seeking out the least costly investments. However, this will also require very significant transfers from industrial countries to the lower-income countries implementing such measures. The relevance of **mitigation** in relation to natural resources management lies primarily in the forest sector. The system of REDD, reduced deforestation and forest degradation, could potentially generate significant income if international agreements are reached. The potential contribution from mitigation in agriculture is expected to be limited. The potential in other sectors is outside the scope of this report.[29]

The natural resources management climate change agenda for Vietnam is primarily one of **adaptation**, with the most relevant sectors being agriculture and water management—including urban flood management. Sea level rise and salinity intrusion are happening and are increasing, with a significant impact likely by 2050, particularly on rice-growing land and also on important lowland and coastal towns and cities. Changes of rainfall and temperature as well as atmospheric CO_2 concentration will affect crop productivity in ways that could be both positive and negative. In the absence of adaptation measures, yields will likely be reduced for rice, maize, cassava, sugarcane, coffee, and vegetables. All predictions are quite sensitive to climate change projections, and as these currently vary significantly, crop yield estimates similarly need to be considered as very tentative.[30]

This information needs to be interpreted in a larger context. This includes considering changes in diets and consumer preferences with falling demand for rice, market liberalization, trade (which will expose Vietnam to lower-cost competition), and conversion opportunities to aquaculture and more salt-tolerant varieties. These forces are likely to be of more importance in the next few decades in determining the development of Vietnamese agriculture. Similar arguments can be raised for water management and urban planning. This is not to dismiss the climate change concerns, which are real and legitimate. Investments in long-lived infrastructure—ports, major roads, hydropower, irrigation systems, and flood protection, as well as in mangrove rehabilitation, climate-resilient marine protected areas, and agricultural research—all need to incorporate long-term projections for climate change. Land use planning needs to consider suitable locations for urban expansion. Even in the short run, there are gains to be made from investing in resilience to counter climate variability and extreme events. Strengthening of disaster risk management is a natural entry point for long-term adaptation.[31]

Natural Resource Management for Sustainable Growth

Some common threads in this VDR are efficiency, environmental sustainability, and equity. This section highlights how these themes tie the chapters together.

Efficiency

Economic theory teaches us that economic efficiency is dependent on complete, exclusive, transferable, and enforced property rights. These "model conditions" are of course not fulfilled in real world economies, but a movement toward them is generally helpful in enhancing efficiency. Vietnam is clearly on its way toward defining private property rights and allowing markets to determine prices for the exchange of property, goods, and services. Each chapter in this report addresses reforms that could enhance efficiency.

The **land chapter** documents important progress in creating more-efficient land markets. However, it also points to significant challenges that remain in providing Land Use Rights Certificates (LURCs) to all stakeholders. The government is preparing a new Land Law, which presents an opportunity to address conditions that affect tenure security. Agricultural land would benefit from more secure tenure to encourage investment and enhance productivity. Allocation across land uses could also be more efficient if the current restrictions regarding rice cultivation were lifted. For urban land, the chapter discusses improvements in management to reduce the high number of disputes and to enhance transparency. Clarification and refinement of the state's recovery powers for economic development purposes could also provide greater security. Land prices based on market signals rather than administrative decisions would guide land allocations towards its highest value use. All these measures can contribute to enhancing the efficient use of land.

The **water chapter** points to the ongoing work on a new National Target Program for water management and the revision of the Water Law as two strategic opportunities to enhance water management. From an efficiency perspective, there is a need to better define user rights to water through a licensing system. This would create a more secure situation for water users and mitigate the tendency for the over extraction of water.

Water is sometimes considered a "free" good or a gift of nature. While rain falls without charge, nature does not unfortunately provide the storage, canals, pipes, and taps for free. Hence, prices of irrigation water and urban water services need to gradually reflect the economic cost of provision. Otherwise, operation, maintenance, and future capital investment will not be undertaken. A vicious circle of poor service and low willingness to pay will remain. Private investors who could provide efficient services will shy away if they cannot cover their costs. But as such services will have a natural monopoly, they will also have to be carefully regulated by the public sector. Vietnam needs a strategic development plan for urban water supply with priorities clearly established for reducing non-revenue water and the provision of new infrastructure. Greater priority should be provided to towns under district control.

Integrated planning based on improved data collection also has an important role to play. The access of competing interests to water is best addressed at the river basin scale. The water chapter points out that river basin planning can be a very powerful integrating measure for water management. It can break down the administrative divisions between governments and between sectors.

As for **forest management**, the chapter points to the need for reforms to enhance the efficiency of plantations through more consolidated leasing arrangements. Furthermore, the potential of forests held by State Forest Enterprises could be more efficiently used by allocation of forests to communities or leasing to investors with resources to enhance productivity. There is considerable room for improving plantation productivity through better plant material and species-sitting. It is recommended that the forest extension system and nursery advisory centers should be strengthened in support of these reforms. The forest chapter also highlights a concrete example of a successful smallholder group management scheme.

The **marine chapter** deals with the fact that capture fisheries are based on a fugitive, common property resource, where exclusive property rights are difficult to define and enforce. This also relates to marine biodiversity. Nevertheless, the chapter provides hopeful examples of co-management schemes where communities have been given defined property rights. This has provided incentives for more-efficient management that limits overfishing and the associated dissipation of rents in fisheries. In this context, it is important that government subsidies are reformed not to further increase the pressure on this resource but rather to provide alternative means of supporting the families of fisherfolk. Making more-efficient use of marine resources also entails moving up the value chain by gradually improving the entire chain of capture, storage, processing, packaging, and marketing. Vietnam has been very successful in this regard so far and needs to build on that experience.

The **mineral resource chapter** documents the rich mineral endowment of Vietnam and the dominance of oil, gas, and coal in current exploitation. It argues that the mineral wealth of the country could be used more efficiently under a regime with flexible "resource assessments" rather than the current model of prescriptive Master Plans. The former would be more open to market-driven exploration and adjustments to localized information. In finalizing the new Mineral Law, the government could strengthen security of tenure and establish objective criteria for evaluation of mine title applications. Vietnam could do more to mobilize private sector involvement in mineral exploration. Clarifying institutional mandates in the minerals sector is also a step in the right direction.

Environmental Sustainability

Using imperfect measures of efficiency such as financial profits and GDP growth does not tell us anything about the sustainability of the economy in the long run or about the environmental costs of growth. An economy can achieve high growth rates and profits while liquidating its natural capital and polluting the environment. The real costs do not show up in the traditional system of national accounts, and the environmental damage may not have (a direct) market price. But ultimately such costs show up in the economy as well, as human health is damaged and long-term resources are exhausted. For example, the economic burden of indoor and outdoor air pollution and of poor water, sanitation and hygiene amounted to 1–4 percent of GDP in a sample of 11 developing countries.[32] A sustainable economy requires that pollution does not exceed the absorptive capacity of the environment, that renewable resources (fish, forests, and so on) are harvested at no more than their reproductive level, and that the profits from nonrenewable resources are invested in other forms of resources (such as human capital).

The **land chapter** points out that the basic principles of the environment impact assessment (EIA) should be applied to all planning development proposals, as an integral part of the basis for approval at higher levels. A strategic environmental assessment (SEA) should be done for the national and sectoral land use plans for 2011–15 and in line with the Law for Environment Protection 2005.[33] Vietnam has progressive legislation on EIA and SEA, but further efforts are needed to strengthen implementation capacity. These assessments offer an opportunity to take into account the expected impacts of climate change on land resources. The land chapter illustrates the conflicting projections with respect to agricultural impacts, but the downside risk dominates. It argues in favor of planning for greater resilience through investment in crop research and water management.

The **water chapter** illustrates that water pollution has reached serious levels. To address this, current laws and regulations—which are often progressive—need to be properly

enforced. The already existing SEA and EIA system needs to be more effectively implemented to close the gap between theory and practice.[34] The same applies for the use of financial instruments to encourage more effective treatment of polluted water. Effective enforcement of these provisions will also create incentives for investment in cleaner technology over time. Vietnam's water management is closely linked to that of other Mekong River states, as a major part of its water enters into the country from them. The threats to delta sediment deposition in the Mekong River from the massive hydropower expansion plans upstream will have to be carefully studied and discussed within the Mekong River Commission.

Much of terrestrial biodiversity is harbored in the nation's forests. The **forest chapter** argues for reform of the current strict forest classification system into one where "protection" objectives could be integrated into "production" forests. It is also recommended to consolidate the currently fragmented management of the Protected Areas system. The piloting of payments for forest environmental services needs to be scaled up to provide further incentives for conservation. The potential to tap into new and possibly significant financing through Reduced Emissions from Deforestation and Forest Degradation Plus (REDD+)[35] needs to be captured. However, this will require improved data capture and analysis, along with monitoring of the forest resource to meet international requirements. Long-term climate change impacts on forest biodiversity also need to be considered to counter habitat changes that will affect biodiversity, increased forest fires in drought-prone areas, and forest pests.

The **marine resources chapter** highlights a series of reforms required to project fisheries and marine biodiversity. Improved data collection and capacity for analysis are needed to enhance planning in this sector. But the overall picture that emerges is that the pressure on the fisheries resource needs to diminish, and subsidies contributing to such pressure need to be removed. The efforts to secure export markets for marine products are linked to the quality of environmental management. This includes efforts to extend eco-certification through the Marine Resources Council and other certification avenues. Expanding and funding the emerging system of Marine Protected Areas that is under way is an important initiative that deserves full support from the international community. Near-shore mariculture may also provide an attractive option to combine environmental protection with private and community-level incentives. The chapter also highlights a few priority species that are particularly worthy of protection, such as sea turtles, dugongs, sharks, and marine species that are attractive in the international aquarium trade.

With respect to environmental sustainability, the **mineral resources chapter** notes that Vietnam has had best-practice legislation on the books since 2005. For example, all mineral Master Plans require a strategic environmental assessment. However, there is a need to close the gap between good theory and insufficient practice in this area through capacity building programs for government staff and logistical support for mining inspections. Capacity building is in particular needed for provincial authorities where mining activities are strong. The application of fees charged to mining operators for environmental damage also requires more effective implementation.

Equity

Equity is not only about income distribution—which is relatively equal in Vietnam—but also about equal access to information, services, participation in decision making, economic opportunity and benefit sharing.

As the **land chapter** discusses, progress in land management has provided an equitable reallocation of agricultural land from cooperatives to farmer households. Vietnam has conducted one of the largest land titling programs in the world. However, unequal access

to information can have a critical impact on the ability to make good use of land markets. An important aspect of gender equity is the Land Law provision of registering both spouses' names on the LURC. It will be important to bring all LURCs into compliance with this provision. It is recommended to develop a national policy on compensation and resettlement based on the principle of market price compensation.

The **water chapter** highlights that access to clean water and improved sanitation is highly unequal. Concerted efforts are needed to raise the standards of water supply and sanitation facilities, especially in rural communities. Not only investments in hardware are required; the chapter points to the need for raising awareness about environmental health to ensure behavioral change to match the investments. It also highlights that integrated water resource management provides the opportunity for communities to participate. It can provide the integrating framework for water-dependent socioeconomic development planning and for poverty reduction interventions. There is considerable scope to increase food production, enhance livelihoods, and reduce poverty in existing irrigated areas. The preparation of a long-term irrigation subsector reform and financing plan is important and could contribute to participatory planning and implementation.

The **forest chapter** advocates reforms to further strengthen community involvement in forestry. This entails a particular focus on mountainous areas where some of the poorest people in Vietnam live. Coastal zones, with their potential to rehabilitate and expand mangrove forests, also deserve focus. Co-management arrangements require a clear policy framework and the formalization of the role of community representatives. Longer-term leasing arrangements, when appropriately coupled with payments for forest environmental services, should be encouraged. Cooperation between the Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment could be strengthened to provide a single consistent process with respect to allocation and planning of forestland.

Marine resources are under severe pressure in Vietnam, and relatively poor in-shore fishers are particularly vulnerable in the increasingly competitive hunt for fish catch. This is yet another argument for strengthening their property rights. The marine chapter provides some examples of successful co-management in fisheries. Equitable sharing of benefits is an important feature of this approach, and legal reform is needed to support this development.

The chapter on **mineral resources** proposes the establishment of community development agreements, with reference to successful international experience. These can ensure local communities of appropriate benefit sharing. Addressing the insufficient database on mining would also contribute to efforts to enhance the social impacts of mining. Finally, joining the Extractive Industries Transparency Initiative provides an opportunity to demonstrate publicly how the mining sector is contributing to the tax base of the country and therefore to the benefits of the national population.

A Reform Agenda

Vietnam is already engaged in a dynamic reform process, and much of what is proposed here is well in line with the directions set out by the MoNRE 2010 Plan of Action.[36] This report aims to build on and reinforce that momentum. In very broad summary, this reform agenda for natural resources management involves:

- A public management focuses on better administrative coordination and enhanced data gathering, analysis, and public dissemination to support functioning markets and efficient public decision making. This will contribute to economic efficiency, environmental sustainability, and social equity.

- The assignment of clear and more secure long-term property rights and an increase in the use of market prices to provide incentives for investment, growth, and decentralized solutions. This is fundamental for greater efficiency.
- Enhancement of environmental regulatory implementation to close the gap between theory and practice; assigning values to the environment where markets fail to do so; scaling up of co-management schemes in forestry and marine resources and of payments for environmental services; and the integration of climate change in public planning. These are fundamental to environmental sustainability.
- Community benefit-sharing schemes, fair-market value compensation for property expropriation, improved information access, transparency in governance, and public participation. These are fundamental measures to ensure equity in natural resources management.

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CHAPTER 2

LAND MANAGEMENT

Land management[37] in Vietnam has gone through dramatic changes since the start of the economic reform process in mid-1980s. The equitable reallocation of agricultural land from cooperatives to farmer households in early stages of the on-going economic reform process established a solid foundation for rapid economic growth and poverty reduction. This has been followed by one of the largest land titling programs in the world. The fundamentals have been put in place for land management in a transition economy, and progress has been impressive.

However, the land reform policy remains incomplete and there are still considerable gaps between the land policies and their implementation in localities. Furthermore, the future challenge is how Vietnam can stimulate a more-efficient use of scarce land resources, promote an environmentally sustainable land management—especially in the face of climate change—while paying due attention to social equity. This is a formidable agenda, and this chapter focuses largely only on matters of efficiency, with secondary treatment of environmental sustainability and equity. Climate change is addressed more holistically as part of the strategic overview in Chapter 1.

To address future challenges, a reform agenda is proposed as a contribution to the ongoing policy and institution development efforts led by the Vietnamese government. The proposed five reform areas do not fall perfectly into the three categories of efficiency, environmental sustainability, and equity, as each reform area may contribute to more than one category. The efficiency reform agenda includes enhancing land use rights and modernizing land administration as the basis for more-efficient land markets. Strengthening land and property taxation is also necessary as incentives for more efficient land use and instruments of fiscal improvement. Environmental sustainability will require improving land use planning to regulate environmental impacts from various forms of land use and to integrate climate change concerns. Finally, there is an important equity agenda in community land allocation and titling, and improving land acquisition and compensation.

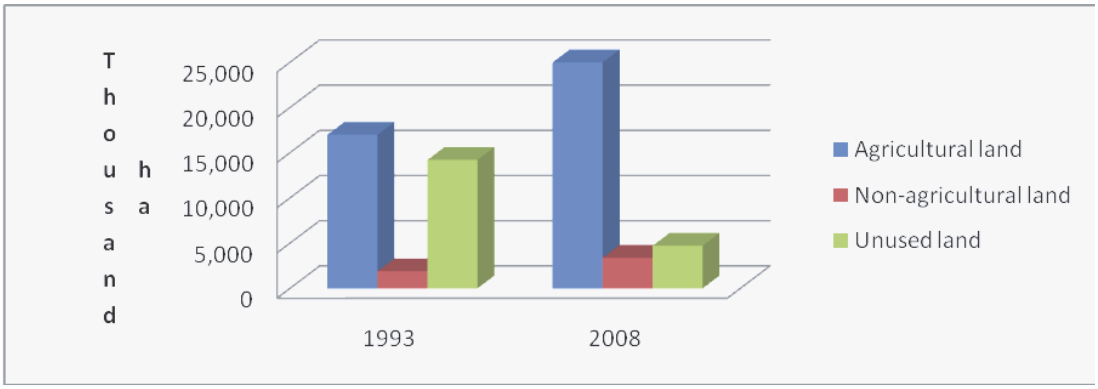
Vietnam's rapid and sustained economic growth and poverty reduction in the last two decades have been rooted in land management reforms. In rural areas which account for three-quarters of the total population and the vast majority of the poor, agriculture is the main livelihood for more than half of the country's work force. In rapidly growing urban areas, greater tenure security represents a prerequisite for sustainable improvement of housing and environmental conditions.

Land Resources and Dynamics

"Tấc đất tấc vàng" (an inch of land is worth an inch of gold) is a very popular Vietnamese proverb about the value of land resources. With the total area of about 33 million hectares and a population of 86 million (in 2009), Vietnam's land endowment is one of the world's lowest on a per capita basis. Less than 0.3 hectares of agricultural land per person is available.[38] However, high land fertility combined with favorable climatic conditions and labor abundance allows Vietnam to secure national food security and compete successfully in a number of important agricultural commodities, including rice, cashew, coffee, rubber, and pepper.

The land use intensity in Vietnam tends to be high, particularly in wetland rice agriculture and human settlement centers. The on-going economic reforms since the early 1990s have been accompanied with further intensification of land uses. First, most of suitable lands have been put under utilization, raising the areas of production and conservation forestland and

Figure 2.1. Vietnam: Land use, 1993 and 2008



Source of data: GSO 1994 and 2009.

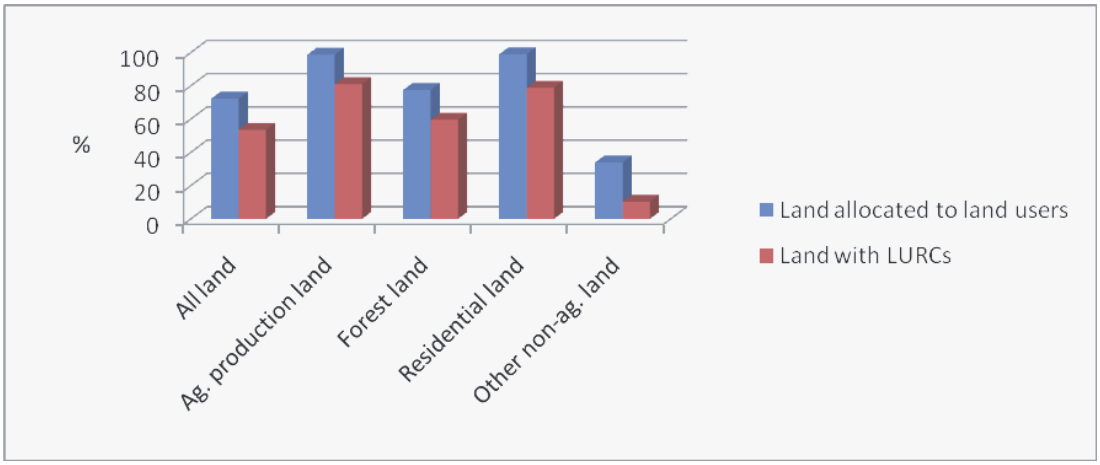
agricultural land in the expense of the so-called unused land. This led to unprecedented changes among land categories and subcategories as summarized in Figure 2.1[39]). However, the total land area devoted to rice has been topped at 4.1–4.2 million hectares since 1993 and any considerable increase would be associated with large investments and environmental costs. Second, within each category land uses have also intensified. For example, the average number of paddy crops has increased to almost 2 per plot-year. Average yield of paddy per hectare reached 4.9 tons per hectare in 2006-7–higher than Asia's average yield of 4.2 tons per hectare according to the FAO. Third, there was also the accelerating conversion of agricultural land into higher-value nonagricultural land, especially at the urban fringe. During 1993–2008 almost half a million hectares of agricultural land was converted into urban, industrial, or commercial land.

Equitable access to land and secured land tenure have been vital factors behind Vietnam's rapid and sustained economic growth and poverty reduction in the last two decades. Access to land is obtained through land allocation by the state, family heritage or grant, land market transactions, and land reclamation. The former means the assignment by an authority of the land usage(s) of specific land plot(s) to particular land user(s), often through an administration act. Land allocation played the primary role in providing farmers' access to agricultural land in North and Central Vietnam, where collectivized agricultural land was redistributed to farmer households in the late 1980s–early 1990s at the beginning of the on-going economic reform process.[40] State land allocation is still one of the most critical steps for firms and other organizations to get access to land.[41]

According to the General Statistics Office, 72 percent of the total land area had been allocated to land users by 2009. However, the progress was uneven among land categories. Almost all agricultural and residential lands but only 78 percent of forestland and 45 percent of nonagricultural lands had been allocated or rented. The distinctive feature is that, compared with many other developing and transition countries, in Vietnam cropland has been allocated quite equitably among farmer households.[42]

However, the state's formal recognition of the land user's rights through the issuance of Land Use Right Certificates (LURCs), which are absolutely necessary for secured tenure and formal land transactions, including legal protection of land use rights and access to formal credits, is much slower. (See Figure 2.2.) By 2010, almost 31.3 million LURCs had been issued,

Figure 2.2. Progress of land allocation and issuance of LURCs in total and by category, December 2009



Source of data: GSO 2009 and MoNRE report 2009.

covering only half of the total land area (and the total number of land parcels), with the categories of nonagricultural land other than residential land and forestland lagging behind. The issuance of LURCs with both spouses' names—an important initiative to promote gender equity—also lags behind the government's schedule. Hence, at this point only about 30 percent of the LURCs granted are with names of both spouses. Still, this marks significant progress.[43]

Policy and Institution Settings

Land Policy

There has been a significant evolution in the land policy framework in Vietnam over the past 50 years. (See Table 2.1.) A comprehensive policy framework for land management in a transition economy was established in the last two decades. Land Laws 1987 and 1993 paved the way for reallocating cooperative land to farmer households for their long-term use and recognized a range of their land use rights. The Land Law of 2003 supports the country's industrialization and the economic transformation into a market-oriented economy, covering comprehensively all the legal, land use planning, land finance, and land administration systems. Decree 84 in 2007 helps address issues associated with the implementation of Land Law 2003. The current land policy framework places an emphasis on the role of state and pays less attention to the promotion of the participation of other stakeholders in land management or to effective and sustainable use of land.

Institutional Setting

The institutional arrangements for land management are characterized by multiple institutional actors with segmented mandates. Land Law 2003 does separate the state management and public service provision and establish a unified and decentralized system of state land administration and management at all levels, from central to commune. However, the system continues to evolve.

Concerning the state land management, the land policy formulation and implementation

Table 2.1. Vietnam's land policy evolution, 1945–2007

Year of introduction and geography	Main policy changes introduced
1952–58 in North and 1956–74 in South	Redistribution of land from landlords to the poor and landless famers and reduction of land taxes
1958–1975 in North	Collectivization and nationalization of land
1975–80	Gradual collectivization and nationalization in the South
1981–92	Establishing the whole nation's ownership over land resources and reallocating cooperative land to farmer households for their long-term uses under contract arrangements
1993–98	Formalizing the longer-term land use rights (sale, transfer, lease, inheritance, and mortgage) and the right to receive compensation in the case of state land reacquisition; granting of LURCs
1999–2002	Extending land use rights to include renting and broadening rights for project investors
2003	Recognizing spouses' equal land use rights; promoting development of property markets in urban areas; setting up unified and decentralized land management system, and establishing the principle of land compensation on the basis of "market-based price of land"
2007	Recognizing the land use rights of the users who do not have legal documents, promoting FDI in property development, setting up transparent procedures for compulsory land conversion and compensation, and settlement of land-related complaints and disputes

supervision are concentrated at the central level. But this role is distributed among a large number of central agencies (such as the administration of natural resources, justice, construction, agriculture, finance, and planning and investment) according to their general mandates. Among them, the Ministry of Natural Resources and Environment (MoNRE), established in 2002, represents the government's designated focal point for the administration of land resources, as well as water and mineral resources. MoNRE's General Department of Land Administration, which was reestablished in 2009, is responsible for daily land resources management. The land policy implementation responsibilities have been greatly delegated to provincial, district, and commune people's committees supported by their provincial/district departments for natural

resources and environment and their commune cadastral officers, respectively.

Land-related public services are provided by Land Registration Offices (LROs). By the end of 2009, provincial LROs had been established in all provinces, while district LROs had been set up in one-third of the districts. But there are no uniform organizational, staffing, and service standards set up for LROs. It has been also widely recognized that the land management institutions lack the capacities to meet increasing demands from land users and to govern the sector effectively. This leads to considerable gaps between land policy and its practical implementation.

Issues

There are three strategic medium- to long-term development challenges facing land management.

First, the rapid growth experienced in the past was based on an extensive use of natural resources, including land. There is now little "unused" land. To support future growth, land must be used more efficiently, and to accommodate the pressures of urbanization and the dynamics of the rural sector, efficient land markets will be essential.

Second, there is a need to put in place a more sustainable land management system, particularly for the most fragile ecosystems such as sloping land in the Northern Mountains and mangrove forests. There is emerging evidence of land degradation due to unsuitable agricultural and land management practices. For example, water logging and nutrient imbalances are preventing further land productivity gains in intensive irrigated rice plantation in the lowlands of Vietnam. Forest clearing and arrested crop succession, particularly when it is associated with the shift toward drier regeneration, lead to losses of biodiversity in favor of *Imperata* grasslands and to soil erosion in the Northern Mountains. These tend to make any livelihood benefits that farmers gained short-lived unless they can switch to more suitable options.[44] The environmental challenge is exacerbated by climate change. (See Box 2.1.) While we give some attention to this in the current chapter, a more holistic perspective is provided in chapter 1.

Third, to maintain and enhance principles of equity in land use, it is vital that the public has full access to relevant information and that acquisition and compensation policies are fair and transparent.

There are also more specific, short-term issues to be addressed urgently in three subsectors:

Agricultural Land

- The agricultural land use rights are still limited due to the rigid land use designation predetermined by the state, relatively short tenure period (20 years), and land use ceilings (2-3 ha/household), inducing suboptimal use of agricultural land.
- Underdeveloped rural land markets pose obstacles for further agricultural productivity gains and inhibit labor mobility toward the higher wage non-farm sector.
- Increasing concerns among policy makers and a part of the public that land market liberalization in rural areas leads to increasing landlessness, negatively affecting the poor.

Forest Upland

- There are competing demands for agricultural and forest uses from existing users (including ethnic minorities, local farmers and dwellers, recent migrants, and State Forest Enterprises) and conservation needs. Processes to resolve these competing demands in economically, socially, and environmentally sound ways are underdeveloped. There are problems

Box 2.1. Climate change and agriculture

Assessments of climate change impacts can be done using a set of models for changes in temperature, rainfall, river basin flows, and crops simulation, to estimate the impacts on crop yield. The main conclusions were that:

- Climate change impacts are region-specific and depend on which scenarios are chosen. The scenario chosen by MoNRE implies little damage or even improvements in crop production.
- Temperature increase is the main negative factor impacting crop yield.
- Country-wide rice yield decreases are estimated to 10–20 percent without carbon dioxide (CO2) fertilization, but less than 10 percent accounting for this factor. The MoNRE scenario, however, results in rice yield increases when CO2 fertilization is considered.
- Sea level rise and salinity intrusion could seriously affect about 500,000 hectares of rice cultivation area by 2050, affecting some 7 percent of the national production.

These results should be interpreted along with other factors influencing rice production (as discussed more in Chapter 1). This study does not predict the impact for a specific year of extreme weather events and inundation. However, the study uses a baseline period of 1978–2007, so the impacts of historical events are implicit in the baseline. The policy conclusion is that Vietnam needs to prepare for a variety of outcomes from climate change by planning for greater resilience in land management. This includes land use planning for sea level rise and saltwater intrusion; development of drought-, heat- and pest-resistant crop varieties; salt- and immersion-tolerant paddy varieties; improved conservation of water; irrigation; and better cyclone and flood forecasting.

Source: Adapted from Zhu 2010.

with interfaces between formal and customary land management. The existing policy framework constrains the allocation of land to communal groups such as ethnic minorities who have long histories of community occupation of certain areas. Illegal or quasi-legal occupation, displacement of long-term occupiers, and the effect of new claimants in areas traditionally occupied by communities (often ethnic groups) are leading to an increase in land disputes.

- The centralized approach to land use planning and land allocation/land classification and fragmentation among agencies in charge of various related issues lead to difficulties in the application of efficient and equitable arrangements at the local level.

Urban Land

- Vietnam faces the challenge of how to integrate the widespread informal property market in a formal framework without losing the beneficial characteristics that have made informality the preferred channel. The informal sector plays the predominant role in urban land and housing provision. The widespread informal property market operates relatively well to allocate urban living space but fails to provide affordable housing for low-income groups, upgrading of services and long-term urban expansion, and address of environment issues.
- Increasing demand on urban and peri-urban land has created a speculative land price boom in major cities that has not been met with sufficient development of new peri-urban areas or densification of

existing areas. This is inhibiting provision of affordable housing and upgrading of services.

- Poorly managed urban growth erodes the tax base and creates environmental hazards. Stringent planning and building requirements have encountered widespread evasion of the standards.

Ultimately these strategic challenges and short-term issues are interlinked in terms of causes, consequences, and/or potential actions. An exhaustive treatment of them all is not possible here. To address the most immediately urgent issues and those that have a good prospect of seeing successful solutions, a limited group of issues has been chosen.

Efficiency Reforms

Greater efficiency in land uses and land markets can be supported by enhancing land use rights, allowing market forces to play a greater role in land resources allocation, improving land administration, and enhancing land taxation.

Enhancing Land Use Rights

Securing complete and enforced land users' rights is critical for increasing economic efficiency of the land resources utilization and management. Land law reforms have significantly broadened and strengthened the "bundle of rights" associated with land holdings, which, to extent, makes legal land users de facto owners, despite the formal land ownership remaining in the state's hands. But the rights are still incomplete and not always enforceable. Thus, there is an important policy agenda on clarifying and enhancing the rights, and simplifying how they can be used and asserted.

First, raising the general public's limited awareness about land policies, completing the first land registration, and developing the capacity of the legal support systems to address land disputes all are vital for putting land use rights in place and protecting private land rights.

Second, it is necessary to address significant limitations in the current land use rights, including restrictions on land use purpose and duration, agricultural land use ceilings, right to compensation, and the government's recovery powers. Although the current tenure period of agricultural land is expected to finish in a couple of years, unclear criteria and procedures for extending the duration of land use rights contribute to a perception of insecurity. On the other hand, a simple mechanical extension of the existing land tenure would not reflect considerable changes in the farmer households' characteristics (such as size and labor force and occupation) which were the criteria for ensuring the equitable outcome of the land reallocation process two decades ago.

The restrictions on land use by the government's pre-determined land use purpose (especially on riceland) and the maximum areas of agricultural land that households can hold prevent them from responding effectively to market signals (such as switching from rice to higher-value crops or productions such as aquaculture).[46] The existing tenure types do not cater for the multi-purposes and functions of land resources as well as complexities of a modern land market. The separation of land and property rights, governed by separate legislative regimes and institutional settings, is affecting the security and certainty of "rights" in the practice. Decision 88/2009/TTg on the issuance of joint certifications of land use rights and ownership of properties attached to the land and the following implementation circulars are a step in the right direction to address the latter issues.

The government is preparing a new Land Law for a more mature market economy to be considered in 2011–12. The opportunity to remove various restrictions that affect tenure security should be pursued. This is related to the type of user, type of use, duration of use, payment of fees, amount of land in possession,

year assigned, and so on. Agricultural land should be converted to longer and more secure tenure to provide greater security and to encourage capital investment, including investment in improving land fertility. This concerns agricultural production land, forestry production land, aquaculture land, and salt production land. Government should also consider removing the limit in the size allowed per household. A valid concern here is that the labor market needs to be able to absorb the increasing number of landless people. Hence, transformation needs to be gradual. In urban land, it is essential to introduce more-appropriate condominium tenures, and their management regimes are required to prevent future disputes. Clarification and refinement of the state's recovery powers for economic development purposes will provide greater tenure security. To ensure the full security of land tenure, it is recommended to eliminate the provision in the Land Law 2003 that "the People's Committees which have authorization to issue LURCs also have right to revoke issued LURCs." The right to revoke LURCs could be put under the authority of the court only. Furthermore, new tenure types, such as marine and infrastructure tenures, should be also considered as part of the development of the new Land Law.

Developing Land Markets

There is a notable evolution of the formal mechanisms providing access to land through market transactions. Firms felt the risk of losing land to expropriation was considerably reduced in 2008 compared with 2006. However, surveys of firms continue to show that businesses face significant constraints in acquiring land assets.[47]

The lack of transparency represents the main constraint to the market efficient function as it imposes unnecessary risks and costs while preventing fair competition among actors. Although the country's real estate transparency index shows gradual improvements, Vietnam has remained one of the least transparent markets over the world since 2006.[48] The main reason is that the urban land market is rapidly expanding but slowly maturing. Efforts to extend the formal market for land have met with limited success, and the absolute majority of land transactions remain outside the formal sector. The urban land market is more focused on investment in land and property for commercial purposes being supported by evolving government policy and legislation. But until recently there has been limited public or private sector investment occurring in the construction of affordable housing for the majority of people.

In contrast, the development of land markets in rural areas remains less intervened upon by the government and fairly stable. Moreover, as it helps address some inefficiencies created during the equitable cooperative land redistribution, the rural land markets produce positive impacts in terms of both efficiency and equity. This is despite raising landlessness among the rural poor.[49] Furthermore, poverty has been falling among the landless, and this is more profound where there are higher returns to schooling, greater equality in land and non-land inputs, and more opportunities for farm household to take up new opportunities in the labor market. In general, the emerging land market appears to be a positive factor in rural poverty reduction, and there is no proof that the rising rural landlessness has put a brake on overall poverty reduction. In fact, it is estimated that land market transactions account for one-fifth of the rural poverty reduction in 1993–2004.[50]

The existing level of government control over the land and real estate markets is constraining their more-efficient operation. In particular, interventions in urban markets not only affect the market transparency, they also limit the availability and affordability of land for businesses and households. Tools to estimate future demand for land and housing are required, and the state would benefit from exploring how it can facilitate more-optimal use of land and how to influence the current high price for real

estate. The criteria and method to help local authorities and businesses identify locations of potential investment projects are still not clear, while procedures and conditions for land allocation and land rental by the state are very complex. In this respect, compulsory auction of land resources, especially public land, has been proved as an effective tool for more transparent allocation of land. (See Box 2.2.)

An appropriate road map to guide the development of the real estate market and to more clearly define the role of government and other stakeholders is a priority in this area. In parallel, a unified Real Property Registration System capable of supporting secondary markets and new forms of tenure should be developed with close links to the Land Registration System under development. To treat land and property (including buildings) as one entity, regulations to ensure the interoperability and data synchronization are critical. Next, the government should consider the consolidation of all its land- and property-market-related policy, legislation, and institutional arrangements into one substantive area of responsibility of either an existing institution or a new one.

Box 2.2. Using auctions to sell public land

Peru uses public auctions to sell public land with great success. The terms of the bidding are made public for at least 90 days. Bidders must prequalify, pay a deposit, and present a business plan for the use of the property. These plans are also made public. Auctions of more than 200,000 hectares of public land have brought in more than $50 million in investment. This has created a large number of jobs and contributed to the Peru's emergence as a major high-value agro-industry exporter in the last 15 years.

Source: World Bank 2010d.

Modernizing Land Administration

Although remarkable improvements to the rules and regulations governing land tenure have been achieved, large investments in land administration are still needed urgently to complete the issuance and reissuance of LURCs or joint Property Ownership and Land Use Right Certificates and to update and digitize land profiles to lay down the foundation for the policy implementation. This requires allowing land users to exercise their rights more comprehensively but also improving the provision of land administration services and state management of land resources. It will also reduce land transaction costs, as many LURCs were issued without proper cadastral surveys and subsequent updating changes. To help expedite the work and keep costs at a reasonable level, the government should consider alternative approaches and methods of cadastral survey and mapping, the most costly part of the work, in line with the actual need for cadastral data accuracy. For example, the data accuracy applied to agricultural land in vibrant peri-urban areas is unlikely needed for agricultural land in remote areas where land market transactions are much less likely (see Box 2.3).[51]

In the long term, improvement of governance and service delivery capacity of the land administration is vital for its sustainability, as the acceptance of its clients remains low. The incidence of registered transactions is estimated at one-fourth of the total number of land transactions at most. Concerning the issuance of LURCs, the survey under the governance module of the Vietnam Household Living Standards Survey (VHLSS) 2008 found significant room for improvement. (See Figure 2.3.)

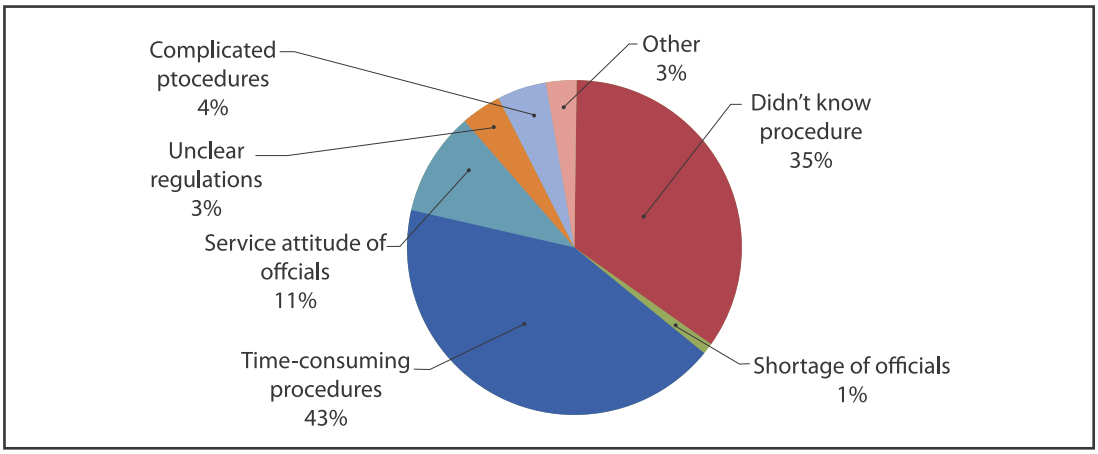
Box 2.3. Low-cost and participatory approach in land administration

Recent years have witnessed the emergence of low-cost and participatory tools, for example Mozambique's 1995 Land Policy, followed by the 1997 Land Law and 1998 Regulation and Technical Annex on voluntary registration; and Tanzania's 1999 Village Land Act,. These tools allow the land registration to respond more effectively to local peoples' perceptions of existing rights and needs. In this approach, land registration documents and secures existing rights by defining boundaries of areas of land belonging to a household or community and establishing an accountable and representative structure for local administration. To take full benefit of this approach, the community should be able to manage basic land administration processes; the boundaries should be recorded and the records be integrated with the regular land administration system. A clear governance structure is required for internal land management and interactions with outsiders, and relevant secondary rights (seasonal grazing areas and watering sources) should be recorded and protected.

An advantage of this approach is that it can quickly cover large areas, be tailored with flexibility to local needs and linked to local land use plans to provide documentary evidence on secondary rights. In Mexico, more than 100 million ha of rural land (two thirds managed by communities and one third by individuals) were titled in slightly more than a decade. Each household received a certificate to three types of land: the house plot, one or more parcels of individually cultivated land, and a proportional share of community land. This process also established an open and accountable internal village structure that entails a clear separation of powers, supervised by a specially formed office of the agrarian ombudsman.

Source: World Bank 2010d.

Figure 2.3. Difficulties when applying for land use rights certificates



Source: Analysis of the Governance Module, VHLSS 2008, September 2009.

Further, despite some recognized improvements since 2006, LURC issuance is still ranked among the top three public services with serious and very serious corruption. The 2008 VHLSS indicated that 86 percent of households think there is corruption in the issuance of LURCs. Companies seem to be experiencing less corruption with LURCs: 37 percent of enterprises interviewed under the 2009 World Bank Enterprise Survey answered that informal payments or gifts are expected or requested when they apply for LURC.

While the severity of corruption remains moderate, several provinces are seemingly falling into a "corruption vicious circle" when the highest level of corruption is associated with the lowest percentage of households believing that corruption has improved. As mentioned in the 2010 *Vietnam Development Report* (VDR) on modern institutions, this is linked to devolution within the land administration, which has led to significant gaps between policy and local implementation actions to be addressed. The decentralization provides local authorities, particularly Provincial People's Committees, with greater autonomy in land management without clear accountability. On the other hand, increasing land conversion, cumbersome multistep land allocation and registration procedures, and double land pricing systems applied before and after land conversion create rent-seeking opportunities for some government officials and land developers at the expense of genuine land users and the government.[52] (See Box 2.4.)

MoNRE should address these issues in a comprehensive and systematic manner. The ministry may update the long-term Program for Development and Modernization of Land Administration and Management (2006–20) that it developed in 2008 to provide insight into the government's views on the future of land administration, as recommended in 2010 VDR. In terms of the sector's governance, the accountability of the land administration upward to their supervising agencies and downward to the people they serve should be strengthened. For the former, streamlining and optimizing land administration processes and increasing the uniformity in working procedures and standards across vertical levels are both critical. For the latter, it is essential to develop an effective capacity development program focusing on promoting greater transparency through unified organization, streamlining working procedures, carrying out staff training, and modernizing working facilities, especially the land administration information system, particularly at district land registration offices. It is also important to outline creative communication and awareness raising programs along with proactive community participation accompanied by strengthened monitoring and evaluation and by complaint and dispute resolution. In this respect, special attention should be given to disadvantaged groups, particularly ethnic minorities, the poor, and women, to ensure that their concerns are heard and duly addressed and that equitable access to land administration information and services are provided.

Strengthening Land and Property Taxation

In Vietnam, land and property taxes are still to be developed. Recently the Law on Non-agricultural Land Taxation was enacted by the National Assembly, but it will not be effective until 2012, and the preparation of its implementation guidelines is ongoing.

A significant tax base exists in the urban property market, but effective tax rates and revenue collection are low, as only a small proportion of land transactions are being registered and taxation is not applied to improvements, such as buildings. There is no value-based property taxation system in place. Valuation is significantly affected by the lack of sales evidence, and there is an emphasis on using land taxes as a blunt policy instrument to control speculation and the land market without fully considering the

Box 2.4. Transparency and corruption in land management

Two forthcoming studies show how the procedures for granting LURCs and features of the system of land allocation and land acquisition create conditions favorable to corruption. The first study examines the two sets of processes in a systematic way, following the "process flow" from the first availability of information through the various document filings and official decisions. At each stage it examines two sets of questions: Does the institutional setup create large economic "rents" or profit opportunities that would be available only to those with privileged access or information? And are the institutional arrangements in place to prevent or deter corruption? The study argues that some rents are generated at several stages of the "process flow," notably in the differences between prices paid by investors, official prices used for compensation, and the true market prices. In addition, in many stages of the "process flow" officials are permitted to make decisions in ways that provide little recourse for those affected by the decisions. When transparency is in short supply, such a system opens the door wide for corrupt practices to flourish.

The second study focuses specifically on transparency and examines the degree to which transparency provisions already in Vietnamese law are being implemented in practice. Many land-related documents are required to be public information, either on Web sites or in some other unspecified format. By visiting the Web sites of all provinces and key ministries, the study was able to ascertain how the Web-based transparency provisions are implemented in practice. To understand the degree to which other information is made public, the research team visited 12 provinces, 24 districts, and 117 communes and requested to see the information that is required to be public. The team also asked for information that, although considered important for transparent land management, is not currently required to be public information. These checks were not intended to examine compliance with the law but rather to seek out proactive offices that seem to place a premium on transparency.

The results were very uneven. Although nearly 90 percent of the visited Web sites contain information regarding "List of procedures and forms related to Certificates for Land Use Rights," only about one in three had the required information a citizen would need to file a complaint. The results of the spot checks were still more uneven. At the province level, some mandatory information such as detailed land use plans were only available at half of the provinces, and information was generally even harder to find at the commune level. On the positive side, the study found that some nonmandatory information such as criteria for land allocation or land allocation decisions was made available at some offices at all three levels of government.

Source: Embassy of Denmark, World Bank, and Embassy of Sweden 2010; Nguyen Ngoc Anh et al. 2010.

implications on the overall land market or state finances. The use of the state pricing framework for taxation, land allocation, and compensation for land recovery results in a high number of disputes. There is no tax payable on land used for infrastructure, and the land rental price by the state differs from the market rental price. Hence, a considerable share of local budget has to rely on land sales and rent instead of land and property tax collection.

Vietnam's Non-agricultural Land Taxation Law as currently approved seems to reach its objective to enhance state management of land and houses and to promote more-effective use of land. In particular, it ensures that the state has updated and accurate recording and tax data, including land quotas on all housing units, residential land, nonresidential land, and exempt

categories. It gives government at each level the incentive to ensure this information is accurate and well maintained, although income redistribution appears not to be the main objective. The law's approach is very simple to administer and simple to explain, focusing on making a formula for the tax base as well as valuation procedures that will be easy to administer in a blanket fashion and that will have widespread popular acceptance.

There may, however, be some potential for economic distortions due to the desire for simplicity, particularly in the use of the government-determined land prices as the valuation metric for the tax. International practice would suggest moving toward a system in which valuations are based on the market-based values of similar land parcels in similar locations on an annual basis instead of a five-year basis. Land markets and market values can shift significantly in one year. It is also important to ensure that the use of the tax revenues will be mostly localized and visible in terms of local infrastructure and services to improve the taxpayers' incentives and peoples' political support of the tax policy.

In particular, to ensure effective implementation of the law, the relationship between land taxes and government finance at all levels and the ongoing effectiveness and sustainability of the formal land market should be clarified and strengthened. In the medium term, it is necessary to explore the role of land taxation as a sustainable foundation for financing local government and infrastructure development, placing more attention to the redistribution function of the tax. Viable options to rapidly establish land valuation services throughout the country are needed. In the longer term, the possibility of removing all land and property transfer taxes and introducing annual land taxes should be considered, taking into account its likely impacts on the formal land market and the benefits and costs.

Environmental Sustainability Reforms

Even efficient land markets will require regulation to safeguard environmental sustainability concerns. A primary instrument in this regards is land use planning. The long-term considerations of climate change are also pertinent here.

Advancing Land Use Planning

Compared with other aspects of land management, relatively few substantive changes have been introduced in land use planning since the start of doi moi. Land use planning has remained largely an internal government exercise, characterized by unclear relationships, hierarchy, timing, and linkages between different types of plans such as the Socio-economic Development Plan, Land Use Plans, Urban Development Masterplans, and various sectoral plans, especially at the provincial and district

Box 2.5. Seven principles for efficient, equitable, and environmentally sustainable land management

1. Respecting existing land and resource rights
2. Ensuring food security
3. Ensuring transparency, good governance and proper enabling environment
4. Consultation and participation
5. Responsible agro-business investment
6. Social sustainability
7. Environmental sustainability

Source: World Bank 2010d.

level. First, to reach its ultimate objective, land use planning and land management in general should follow the seven princes formulated by FAO, IFAD, UNCTAD and other development partners (see Box 2.5).

Second, the current land use planning methodology should be renovated to ensure due attention is paid to economic, social, and environmental dimensions (see Box 2.6), with necessary differentiations in terms of content and purpose between the provincial, district, and commune plans. To effectively reflect and respond to conflicting demands for scarce land resources, public consultation during the planning process is critical to ensure any decision

Box 2.6. Case study: Competing land uses, impacts, and repercussions for more-integrated natural resource management in Dak Lak Province

Buon Triet reservoir was built in Lak District, Dak Lak Province, in the late 1970s. It covers 125 hectares, holds around 19 million cubic meters of water, and 95 percent of its littoral area is covered by natural forest in the Nam Ka "protected" forest reserve. The area's land use plan has multiple purposes: forest conservation combined with irrigated rice farming, aquaculture, potable water supply, fishery, eco-tourism, and transport by boat.

But competing demands for agricultural and forest uses from existing users (including ethnic minorities, local farmers and dwellers, and recent migrants) and the management have resulted in illegal changes in the intended land uses. This led to extensive deforestation. Parts of the Nam Ka forest reserve along the reservoir shoreline are being burned to make way for coffee and maize production. The resulting land degradation was accompanied by the deterioration of water quality. In addition to food safety issues, the forest destruction has driven away wildlife and potential eco-tourists.

Current efforts to resolve these competing demands focus on developing locally adapted solutions and processes for a holistic management of the natural resources. This includes the establishment of a fishers association to work closely with irrigation, fisheries, and forest sub-departments in the Department of Agricultural and Rural Development and a fisheries co-management group consisting of the Irrigation Department, the Commune People's Committee, fishers, intermediaries, and local police, taking into account the ecological baseline survey in 2009 and 2010. However, it has also been recognized that poor households will continue to break the law as long as viable income generating alternatives are not provided for them. Addressing this requires not only changes in the current land management practice but also an in-depth revisit of the area's existing socio-economic development strategy and associated land use plan.

Source: Adapted from a contribution by Michael J. Akester.

is made when most people and stakeholders are aware of the changes being considered. This will also help limit the situation when the "people in the know" have more access to the land than other people and can acquire the most valuable land. As unveiled through the survey under the governance module of VHLSS 2008, some 60 percent of interviewees stated that they were not consulted about their commune land use plans, while 77 percent said they had very little or no information about the plan.

In pursuit of national food security objectives, the government has set a target of keeping 3.6-4.0 million hectares under rice plantation until 2020. This target seems not to have been based on considerations of future (domestic and international) market demands and the possible negative impact of land use controls on farmers' welfare due to potential overproduction. In this respect, it is a critical to conduct an analysis of food security scenarios. The scenarios should take into consideration the expected impacts of climate changes on land resources available for food production, changing yields and risks, and the costs and benefits of agricultural climatic changes adaptations. Donors and the government are collaborating in this respect with an analytical report to be delivered in the early 2011 in support of the government's preparation and finalization of its food security program and land use plan for 2011–15 and toward 2020. A more flexible land use management regime allowing farmers to convert their land from rice to other crops and vice versa—based on market demands and considerations of profitability, comparative advantage, and risk management—would also achieve national food security objectives with lower financial, economic, social, and environment costs.

Third, the basic principles of environment impact assessment should be applied to all planning development proposals, as an integral part of the basis for approval at higher levels. In particular, the strategic environmental assessment should be done for the national and sectoral land use plans for 2011–15 and toward 2020, at least at the "inter-provincial and inter-regional levels" as requested by the Law for Environment Protection 2005.[53] Again, these plans and assessments should take into account the expected impacts of climate changes on land resources.[54]

Finally, an effort should also be made to adopt an integrated spatial planning approach that provides a more sustainable use of land and other resources linked to land. The framework should incorporate broad zoning at the provincial level, supported by a detailed land use plan at the district level and a hierarchical-based land classification system. Such a planning tool would include multi-stakeholder consultations, cross-sectoral economic, social, and environment analyses, and joint problem identification and solving. Work is needed to provide a road map that identifies how to rationalize and align the existing legislative, policy, and institutional frameworks to support this new land use planning approach. Further, integrated spatial planning is impossible without making available data and maps derived from land administration, environmental management, urban development, agricultural and forestry practices, infrastructure and other services. In addition to MoNRE's implementation of the Environment and Land Information System, investing in a broader National Spatial Data Infrastructure (NSDI) will also help reduce duplication in data collection and maintenance and improve data consistence and reliability across the sectors as shown in many countries. Under the NSDI, designated data custodians (for example MoNRE) produce and maintain key datasets such as the geodetic/geospatial framework and the cadastral base, and other agencies can access these core datasets and utilize them to underpin their sector applications through assigned and accepted protocols.

Equity Reforms

More attention should also be given to equity concerns. Concerning this as well as environmental sustainability, it is essential that the

new Land Law also recognize "community" as an eligible forestland user and thus bridge the gap between the current Land Law and the Forest Protection and Development Law.[55] The long tradition of Vietnamese communities, particularly ethnic minorities, to manage their land—especially communal forestland and unused land—has been confirmed by several pilots and gradually acknowledged in various legal documents (also discussed in the forest chapter of this report).[56] Results so far indicate that communities welcome the allocation of the land and forest resources to them and can manage their forestland and forests well after the allocation. Facilitating titles to communities for land and forest utilization would help confirm their existing rights and alienate potential illegal or quasi-legal occupation or claimants. Allocation to communities is often socially more acceptable and economically more viable than allocation to individuals. Clear allocation to communities and their management responsibilities lead to more responsible use of the economic and environmental potential of the forest areas by the communities and other stakeholders concerned, increases in investment, and thus greater economic benefits. For the state, the environmental functions of the land and forest are secured with lower allocation costs than the allocation to individuals.

However, there are also risks associated with improper community land titling, such as continuing and new conflicts, reduction in forest areas after the land allocation, and greater follow-up costs. There may be a number of policy options, depending on the extent the customary law is taken into account. Legalizing customary claims in full accordance with customary law is likely to ensure higher acceptance by customary groups but might conflict with the state's objectives of land allocation (land mobilization, for example, or forest and biodiversity conservation). Other options follow customary practices to a lesser extent and may result in lower acceptance but give the state a greater chance to achieve its land allocation objectives through direct interventions. Thus, the gaps between customary and statutory rights can be narrowed but always remain, as the rights are based on different justifications.

In this respect, customary titling should be carried out with necessary precaution. In particular, it is proposed that customary titling is conducted for the communities already managing forest or "unused" land de facto first before a wider implementation in new areas. A careful policy design is also required. First, the legal framework should be revised. Second, institutional setting, guidelines, and funding in support of the community management capacity development are to be set up. Finally, lessons from existing pilots are to be distilled through impact assessment and disseminated to stakeholders.[57]

In addition, government needs to develop mechanisms capable of providing greater access to land for small and medium-size enterprises and the poor and vulnerable. In the short term, priority can be given to the reallocation of underused land holdings by the state-owned enterprises which control more than 4 million ha of forest land. Their existing preferential access to land and continuing large-scale holdings limit the availability of land while their leasing to private firms contributes to the amount of land held under informal tenure. Unlocking these important land resources is an effective way to make their usage more efficient and equitable.[58]

In the longer term, equitable outcomes of government land allocation and land markets are impossible without more proactive participation by all stakeholders involved. Stakeholder consultations and research should be undertaken to assess what additional policy measures, legislation, or operational changes are required to support the maturing market and encourage greater participation in the formal market. This work should focus on assisting the state to achieve an appropriate balance between managing the land resource in support of the

whole society, and particular attention to the poor and vulnerable.

Improving Land Acquisition and Compensation

Land acquisition and compensation are important for equity. Administrative complaints regarding land account for 70 percent of the disputes, complaints, and denunciations the government receives every year. The direct reasons are related to the government's compensation and resettlement (70 percent), violations of land legislation by government staff and organizations (10 percent), and administrative decisions on land dispute settlement (9 percent). Overall, about half of the complaints or denunciations expressed dissatisfaction with the implementation of the land compensation policy and procedures.[59]

The current approaches to recovery and reallocation are slow, not transparent, and unpredictable, with rent-taking behavior common, skewing the availability of urban land and frustrating investors. At the same time, existing constraints on the urban land market, along with the budgetary imperatives of local governments, stimulate excessive reliance on conversion as a way to open up new land, leading to inefficient forms of urban growth. Conversion relies heavily on smallholders or residential households.

Decrees 84 in 2007 and 69 in 2009 set up quite transparent procedures for compulsory land conversion and compensation. They provide guidance for compensation at market prices and coverage of income recovery costs. MoNRE is working with the donor community to consider several options and develop guidelines to improve the Decree implementation. Furthermore, the development of a National Policy on Compensation, Assistance, and Resettlement is recommended and should be based upon a more equitable distribution of benefits between current land users, the state, and the investor, along with preparation of a compensation and resettlement plan and consultation with affected land users before the recovery decision is made. The policy should address the case of compulsory acquisition being denied for investment projects that are noncompliant with approved land use and identify clearly in what cases the state can use its power to acquire the land. Further, to put into place the principle of land compensation on the basis of market prices, it is necessary to develop legal and institutional frameworks for the provision of land valuation services through independent valuation services. The experience gained in Ho Chi Minh City could be very relevant in this respect. The policy should also make the recovery process and dealings with public lands more transparent and should work to identify taxation and financial mechanisms to reduce the budgetary reliance of local governments on land conversions and the sale of land.[60]

Further, there is a need to improve the current land-compensation-related grievance redress mechanism. The ongoing efforts toward the promulgation of the new Land Law and the Law on Complaints and the Law on Denunciations provide an opportunity. Efforts in this direction should focus on promoting people's right to express their grievance, raising public awareness about the right, channels for grievance filing, redressing, review, investigation and resolution, and an effective grievance monitoring system . It is also recommended to strengthen the necessary implementation capacities of Project Management Units of public investment projects with large land acquisition and compensation works through establishing their specialized Grievance Redress Unit and project complementary grievance channels and monitoring system and through allocating sufficient funds to meet requirement of the grievance redress process. In a broader context, setting up arbitration councils at district, province, and central levels with the participation of representatives from government authorities, professional agencies, and mass organizations

would provide potential parties with an opportunity to resolve complex administrative complaints in an independent manner. In the long term, these can be replaced with administrative tribunals, as done in many other countries.[61]

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CHAPTER 3

WATER RESOURCES

Vietnam is not secure in its water resources: more than 60 percent of water flow comes from other countries, shortages now occur in many rivers over the long dry season, and some aquifers have a limited life. In the short wet season, many people are killed and enormous damage inflicted. Water pollution continues to get more severe. In the face of the pressures from the economic boom, Vietnam needs further reform to achieve greater efficiency in water use, improved environmental sustainability, and enhanced equity in access to water services. Water resources development has provided many benefits for human life, health, and environment. But institutional and legal arrangements need greater clarity. Despite great efforts, about half the population does not have an adequate water supply. Sanitation coverage is worse. New approaches will be required to meet future food security and to effectively maintain infrastructure that is dilapidated. Water rights are not defined, leading to inefficient and unsustainable investments and to stress on water sources. Climate change is adding to these already serious challenges.

Approval and implementation of a new National Target Programme (NTP) on Water Resources will be critical. A similar strategic approach is also needed for the coastal zone. Dealing with efficient water use must focus on the efficiency of water supply and use in all subsectors, a water rights framework, and river basin plans to set out water allocation rules. Improving social equity requires increased investments for pro-poor rural development, irrigation diversification, and a strengthened ongoing NTP II, particularly on the sanitation side. Environmental sustainability will require a focus on pollution from untreated urban wastewater as a priority. For industrial pollution, the emphasis should be on far stronger use of existing measures and a more strategic approach to pollutants and their cause.

Water moves significantly across land and over time. Prolonged droughts severely limit water availability, at times extending over many years; severe wet season storms can bring devastation. Water also transports nutrients and sediment through the river basin and exports these to the coastal zone. Catchment activities can increase or decrease this movement and its quantity and quality—affecting both river and coastal morphology and ecosystems. This chapter must be considered in terms of these critical interactions.

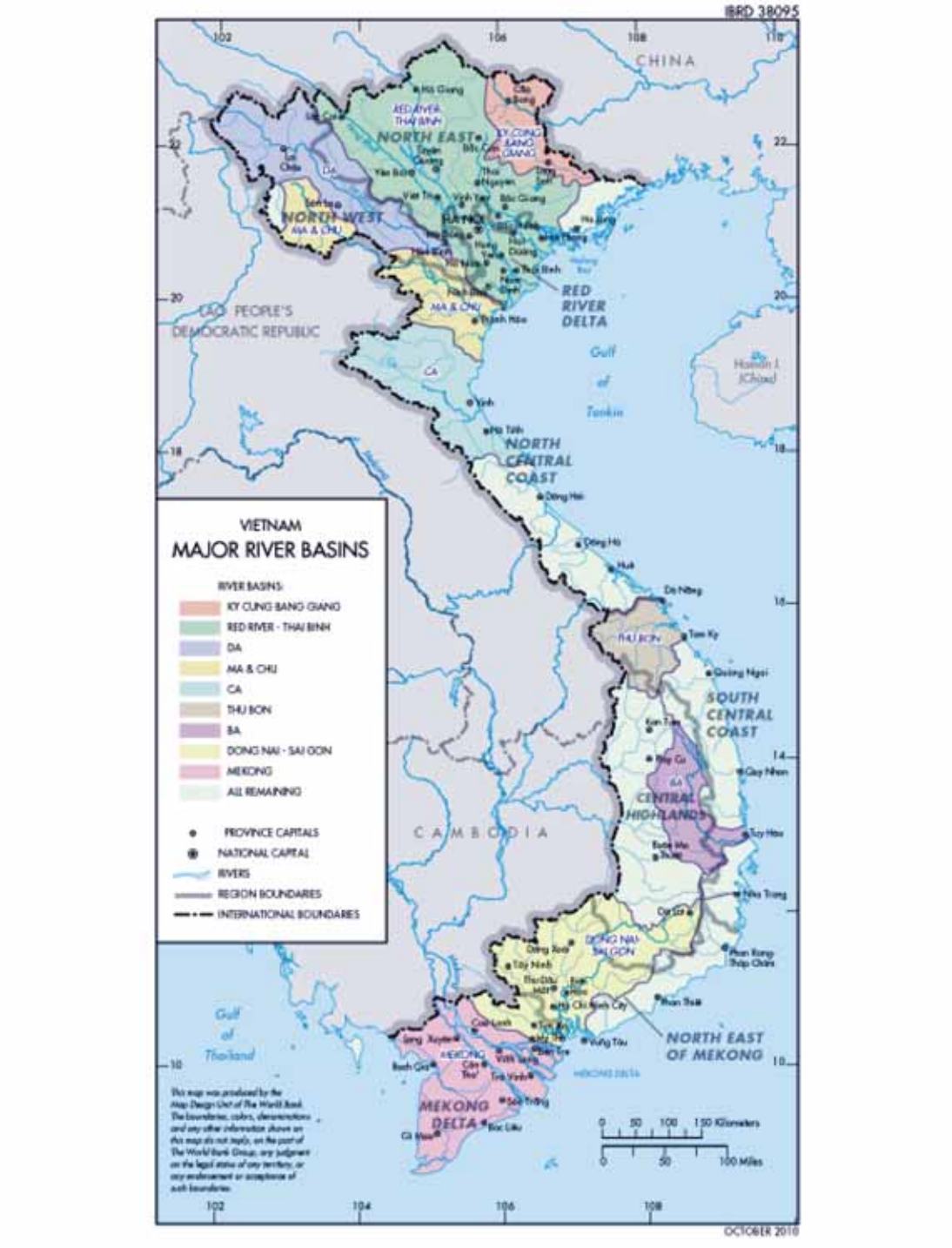
Water Resources in Vietnam

The Water Sector Review (WSR) has shown the limits of Vietnam's water resources:[62] 77 percent of surface water occurs in only three river basins (Figure 3.1) and more than 60 percent of the total surface water flow originates in other countries. While the total annual surface water exceeds the international standard for having adequate water,[63] making such assessments based on annual water is very misleading. There are long and severe dry seasons, during which only about 20–30 percent of the yearly water is available. By international standards, in the dry season and at current development levels, about half of the 16 major river basins are currently experiencing irregular or local water shortages.

It is a different story in the short wet season. Vietnam's geography and topography make the country extremely vulnerable to typhoons, storms, and floods. Heavily populated areas such as the Red and Mekong River deltas and the Central Coast are especially vulnerable. Each year hundreds of lives are lost, and there is enormous damage to livelihoods and infrastructure.

Water quality in upstream river reaches is still relatively good except for some locally polluted areas. However, in the downstream reaches, especially for rivers flowing through industrial zones and large urban areas, the quality gradually deteriorates as wastewater

Figure 3.1. Major river basins



discharge pours into the rivers, largely untreated. Some river sections are now classified as "dead rivers" unable to support any life.[64] Ponds and canals in urban areas have become sewage storages and drains.

Vietnam has large quantities of good-quality groundwater used to provide water for living (groundwater provides about half the domestic supply) and for various economic uses. But there are areas of concentrated extraction where water use is unsustainable. In Hanoi and in parts of Ho Chi Minh City, water levels have fallen about 30 meters from natural levels. Overexploitation also occurs in the Central Highlands and in the Mekong Delta,[65] and some aquifers now have a limited life. There is very poor information on the quality or quantity of groundwater to ensure sustainable use. Groundwater is also very vulnerable to pollution, and some important sources are now severely polluted and may not recover.

Provision of Water Services

The pace of Vietnam's urbanization and industrialization has been beyond the capacity of the water supply and sewage systems to cope. Figures on water supply and sanitation coverage are the subject of dispute and should be seen as rough indications. Nevertheless, they do tell a story. Around 14 million people out of the 22.5 million living in cities have access to clean water. However, less than 60 percent have a house connection; the remainders get their water from shared standpipes or wells. Basic water services are generally far less available in district towns. The current standard of service is poor in terms of both quality and volume, with water losses being very high.[66]

Sanitation in the major cities is said to be available to almost all of the population, but this figure includes access to a "sanitary latrine." In provincial towns, 75 percent of households are not connected to any form of local or central sewerage system; they use a septic tank. Less than 10 percent of the urban wastewater collected each day is treated.[67] Where they exist, most urban drainage systems combine storm water and untreated domestic wastewater.

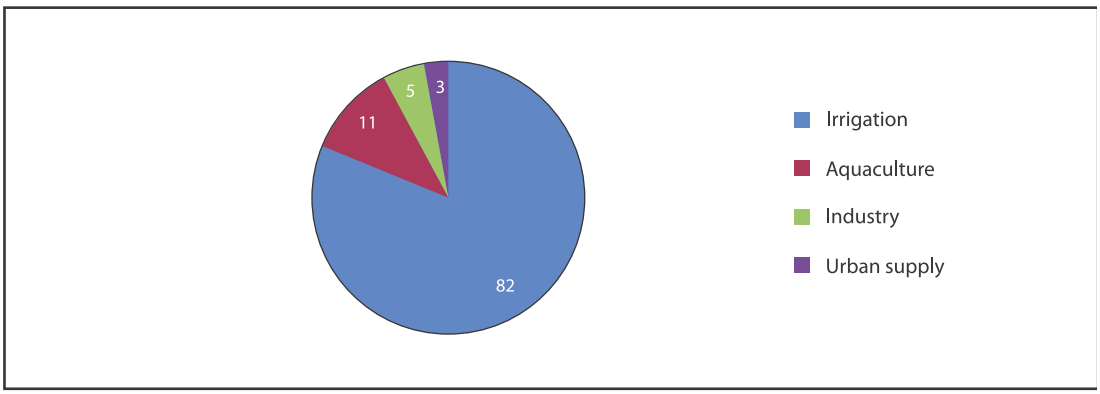
Although Vietnam has made rapid progress in improving its water supply situation, many rural areas are not covered. Some 41 million rural people do not have a supply that meets "clean" water standards set by the Ministry of Health (MoH). Only 8 percent of people receive piped water in their homes or yards, 82 percent have access to water from improved sources outside the house, and 10 percent still depend on unimproved drinking water sources.[68] Progress in providing access to sanitation and hygiene has been especially difficult. A recent survey[69] revealed that while about half of rural people have some sort of sanitation facilities, only 18 percent have access to latrines that meet MoH hygienic standards.

Use of Water for Economic Production

Nationally, more than 80 billion cubic meters of water are used each year. Figure 3.2 indicates the current sectoral allocation. By 2020 this is expected to increase by about half with particularly sharp rises for industry and urban use.[70]

Agriculture's share of the gross domestic product (GDP) is declining, but output is expanding and the sector remains a key contributor to the economy and employment. Vietnam has become a top exporter of rice, coffee, cashews, and pepper. Agriculture sector GDP value has doubled in real terms since 1993; it provides employment to about 70 percent of rural households. Paddy production accounted for almost 80 percent of the country's gross food crop production value in 2006. Between 1990 and 2008 the area under rice grew by about 20 percent, but national production almost doubled, to about 38 million tons. [71] (See also Box 3.1.)

Figure 3.2. National surface water allocation (percent)



Source: ADB 2010b.

Hydropower provides about a third of the total national power capacity of more than 26,000 megawatts. Hydropower in the Red-Thai Binh and Dong Nai River basins accounts for over 50 percent of the internal hydropower capacity. Under the power Master Plan VI,[72] about 26 more reservoirs are planned, some of which are now being built. While hydropower has many advantages in electricity generation, there are also many disadvantages that are only now being appreciated, particularly in a Mekong River context. This will be critical in the future as the projected level of development of hydropower potential is going to be extremely high in Vietnam.

Relatively speaking, industries do not use a lot of water. But wastewater discharge from the booming industrial sector and from craft villages is causing serious pollution. Nearly 70 percent of industrial parks are located around Hanoi and Ho Chi Minh City, and many industries are state-owned. Environmental improvement is lagging, and few industries have effective wastewater treatment. Less than half of the facilities have central wastewater treatment systems. The craft village subsector has also witnessed phenomenal growth, especially around Hanoi. More than 40,000 enterprises are located in craft villages, with around 80 percent of those being small family businesses. Almost all village households

Box 3.1. Inland fisheries and aquaculture

Inland capture fisheries landings are estimated at about 200,000 tons in official statistics—almost certainly an underestimate. Inland fisheries, particularly in floodplains and rice fields in the Mekong and Red river deltas, provide an important source of aquatic products for rural people's nutrition and seasonal income. Although there is a dearth of statistical data, several studies indicate that inland fisheries are of considerable importance for poor people in many parts of Vietnam, not only full-time fishers but also households that have fishing as a component of wider livelihood strategies. Accordingly, a study by the Tropical Biology Institute of Ho Chi Minh City documented annual yields in 2001 as high as 430 kg/ha from a 45,000 ha area in Can Tho and Kein Giang Provinces in the Mekong Delta. Considering that the Mekong Delta has a flooded area of about 1 million ha during the rainy season each year, the contribution from floodplain fisheries in that part of the country would far exceed the current estimate of inland fisheries in Vietnam. Based on fish consumption estimates, MRC has estimated that production in the delta areas of Vietnam could be as much as 300–900,000 tonnes/year. [73]

Inland fisheries are threatened by pollution, including the use of agrochemicals and flood control projects that close off breeding habitats and nurturing grounds for resident and migrating fish and other aquatic species. These threats are particularly significant for poor households that depend on the fishery. Actions to assure the sustainability of inland fisheries include further assessment of its importance to the national economy and to local farmers and poor inland fishers in relation to trade-offs, such as flood control for agriculture; identification of appropriate management measures, such as appropriate gear and closed fishing seasons in selected areas; and establishment of sanctuaries to protect key breeding and nurturing habitats and to sustain or improve productivity and biodiversity conservation.

Aquaculture has grown significantly in recent years, averaging over 12 percent annual growth since 1990. The area under all aquaculture has now reached nearly 1 million hectares, with a total output of over 1 million tons—over a third of all aquatic production. Aquaculture production mainly comes from freshwater aquaculture, especially for river catfish, while the export value mainly comes from marine and brackish-water aquaculture (most of this income is generated within the Mekong Delta). Small-scale producers dominate the subsector, with pond areas of under 0.1 hectares. Aquaculture and the associated fisheries processing industries can contribute to significant water source degradation through water use and pollution.

Aquaculture contributes more than 40 percent to total fishery production. In terms of production, the freshwater subsector remains dominant, with approximately 65–70 percent. The production of Pangassius catfish exceeded 1.2 million tons in 2009, exporting about 600,000 tons worth $1.4 billion. Brackish water aquaculture (mainly shrimp) contributes around 220,000 tons and more than 40 percent to the overall value of production. Crab farming and limited farming of marine fish and mollusks, in particular, provide the remainder.

Environmental concerns relating to aquaculture development in Vietnam include:

- Localized water pollution from concentrations of freshwater and marine cage farms and lack of consideration of carrying capacity
- The need for more care to be taken with introduction of new exotic species, due to risks of disease and impacts on aquatic biodiversity
- The significant loss of mangroves and wetlands from conversion of coastal areas and estuaries to shrimp farming
- Aquatic animal disease outbreaks, water pollution, and salinization caused by poorly planned and managed shrimp farming in sandy and agricultural areas
- The dramatic recent rise in the use of trash fish in marine and freshwater aquaculture; such environmental interactions need careful consideration in the promotion of aquaculture in Vietnam and should be addressed through better environmental planning and management practices and capacity.

Aquaculture is essential to meet future demand for aquatic products. While aquaculture has expanded to supply domestic and export markets, issues concern the available limited capacity in the country to promote and guide its sustainable development in fresh, brackish, and marine environments. The main concerns are related to quality and sufficiency of seed and feed supply, disease control, and management of environmental impacts, including understanding of carrying capacity of sea and inland water areas, extension services, and marketing channels and quality control systems. More emphasis can also be placed on using aquaculture for poverty reduction. The quality of the product has been a concern in some export markets, and anti-dumping cases have revealed the vulnerability of the sector to external factors related to international trade.

Climate change will affect aquaculture, but in different ways for the main subsectors. A cost-benefit analysis for 2010–50 indicates that even without climate change, the catfish industry will face difficulties. These are expected to be exacerbated by climate change. In contrast, shrimp aquaculture shows good profitability for another couple of decades even with climate change.

Source: Ministry of Fisheries and World Bank, 2005, FAO Web sites, Nguyen Van Trong 2008, and . WorldFish 2010.

use their houses as production sites, with waste discharged directly into the surrounding environment.[79]

Major Issues Concerning Water Resources Management

In the past decades, there have been important achievements in the exploitation of water resources and in the prevention of harm caused by water. However, for a long time there has been insufficient awareness of the significance and importance of water for human life, health, and the environment.[80] This section sets out some of the issues that have resulted.

Institutional, Legal, and Policy Context

The creation of the Ministry of Natural Resources and Environment (MoNRE) in 2002 separated the function of state unified management from the functions of exploitation and use of water resources for economic purposes. However, MoNRE is still working towards assuming this oversight function. While international support could be strengthened, the roles of other agencies in the water sector could also be more clearly defined to avoid overlap and to promote more effective coordination. The hierarchy of laws governing both public and private participants is not clear, consistent, or complete.[81] There is little planning or coordination between the sectors, leading to unintended, unfunded, and unmitigated impacts between sectors.

The private sector is becoming increasingly involved, and in some subsectors the government is slowly transforming its functions from that of operator to regulator. But the regulatory framework needs considerable strengthening to facilitate this move effectively. Some state-owned enterprises involved in commercial production activities are inefficient operators with very poor environmental performances.[82]

Another key institutional issue is whether subnational government is capable of effectively fulfilling its devolved roles in water resources management and the provision of essential services and whether effective instruments are in place to hold it accountable for doing so.[83] Accountability in the delivery of these functions is important, as subnational governments have roles that are inherently in potential conflict: simultaneously to stimulate and promote development and to protect the environment and the natural resource base.

Vietnam has not yet effectively developed and implemented sustainability-based approaches for water resources management. The National Assembly's Science, Technology and Environment Committee[84] concluded that the current legal framework is sufficient to take action against pollution and resource degradation. However, development and enforcement of the regulatory framework is inadequate.

In particular, Vietnam has found it difficult to integrate the management of natural resources within river basins and coastal zones and to address relationships between these areas. Vietnam has initiated some measures for both

river basin and integrated coastal zone management (ICZM), but there are currently no strong government-led programs in these areas. There are no processes to reconcile the large regional differences when defining "natural" and "acceptable" environmental and natural resource conditions. This also has an international dimension, particularly in the Mekong River, where the massive sediment load that supports and rehabilitates the Cuu Long delta is under threat from the mid-river dams now being considered.[85] Another institutional issue is the lack of reliable and accurate water data and information for decision making, which is a key factor constraining effective management.[86]

Water Security

Vietnam faces a very uncertain water future, as it is heavily reliant on international rivers, dry-season water availability is already showing areas of shortage and conflict, and climate change will accentuate these effects. Already some current water use is unsustainable. The WSR found that under the existing population and economic development levels, during the dry season six river basins are classified as "moderately stressed" and four others are classified as "highly stressed." The Dong Nai River basin, providing about a third of national GDP, is of particular concern. The total reservoir active storage volume (about 37,000 million cubic meters) is less than 5 percent of the total average annual surface water discharge, with about two-thirds of this in two river basins.

The lack of formal rights to water is a concern. Although the Law on Water Resources creates a framework for this, limits to the amount of water that can be extracted have not been established and rights are not defined. New entrants are continually eroding the supply. Many organizations also believe that their water development confers unfettered rights to the water. The current system is one of perceived but unspecified water rights, with sharing rules dominated by the most powerful.

Sustainable Water Supply and Sanitation Services

Despite enormous gains, and given the pressures of urbanization and industrialization, it is not surprising that Vietnam is struggling to ensure water supply and sanitation for its people. The public sector dominates, leading to overlapping roles and responsibilities and a poor focus on service delivery. Inappropriate design standards lead to higher capital costs and have an adverse impact on tariffs, affordability, and acceptability. Sanitation is still considered a private good, requiring support to mobilize and thus maximize the benefits of a new water supply. Poor sanitation causes human distress, as well as considerable economic losses, estimated at 1.8 percent of GDP.[87] Total investment requirements run into many billions.[88]

Urban drainage is also a major and worsening issue for the rapidly expanding major cities and towns. One of the most critical water management challenges in Ho Chi Minh City is the increased need to both protect low-lying parts from storm surges and high tides and to ensure drainage of polluted rainwater and sewage. Intense rainfall that besets Hanoi often leaves major parts of the city paralyzed. Rapid urban expansion is not taking drainage into account.

Sustainable Agriculture and Irrigation Services

Irrigation-based agriculture has been pivotal in alleviating poverty, providing food security, and boosting rural growth. But the rapidly growing population, with increasing affluence, will require much more food and different foods. This will require better and more sustainable management of existing irrigated lands, since opening up new areas is constrained by lack of land and water. Agriculture productivity remains relatively poor, however, its infrastructure is old and dilapidated, and it is reliant on state budgets and foreign development assistance to keep the

systems going. With the irrigation services fee abolished since 2008,[89] systems are quite likely to be deteriorating. It is therefore crucial to monitor the implementation of this new fee policy to ensure that adequate budgetary allocation is provided to support system O&M. Otherwise necessary remedial interventions would have to be taken. The large-scale, centrally managed irrigation schemes are not designed to provide the reliable, flexible and equitable year-round water service that modern farming methods require. [90]

Financing and Assets

The water sector has survived on subsidies and official development assistance, which is not sustainable. The pricing policies that are applied are neither efficient nor fair, leaving grossly inadequate financial resources to maintain/replace infrastructure. The subsector capital requirements are enormous. Yet agencies established to provide water services are far from financially self-sufficient, largely as a result of decisions to curtail charges, particularly at subnational governments. The abolition of the irrigation services fee has serious implications, given the water scarcity situation and the fact that irrigation uses about 80 percent of water resources. This was considered serious enough by the international development partners for the Poverty Reduction Support Credit to issue a trigger requiring technical guidelines for more efficient water use in irrigation.

Pollution and Degradation

Rapid urbanization and industrialization—with untreated domestic, hospital, and industrial wastewater, poor urban drainage, an expansion in tourism, and the use of rivers, lakes, and ponds as dumping grounds for most solid waste—has seriously affected water quality. Much of the untreated wastewater is illegal.[91] Economic losses, mainly due to the health impacts and the cost of protecting humans from pollution of water resources have been estimated to hundreds of millions of dollars per annum. [92]

The National Assembly's Science, Technology, and Environment Committee has reported on the difficulties with institutional and regulatory arrangements, lack of resources, inadequate planning of urban areas and industrial zones, lack of funding for infrastructure, and lack of investment in toxic waste treatment facilities. In addition, community concern about pollution is increasing, perhaps brought to a head by the much publicized Vedan case of extreme and illegal pollution in the Thi Vai River. 93 (See Box 3.2.)

Storms and Floods

Almost 60 percent of Vietnam's total land area and over 70 percent of its population are prone to cyclones and floods, which are often more pronounced where river basins and coastal zones meet. Over the past 20 years, natural disasters have caused the loss of over 13,000 lives and annual damage equivalent to an average 1

Box 3.2. The Vedan water pollution case

Vedan Vietnam is a monosodium glutamate maker. Investigations in September 2008 found Vedan had illegally dumped into the Thi Vai River more than 100 million liters of untreated wastewater per month since 1994, killing farmers' fish and shrimp in ponds and ruining farmland. MoNRE suspended the plant's wastewater discharge license and fined the company about $15,000. The ministry also demanded another $7 million from the company in overdue environmental fees. The company paid the fine and fees. The company has also offered to pay total damages to farmers in Ho Chi Minh City, Dong Nai, and Ba Ria-Vung Tau provinces. Court action against Vedan is under way.

Source: MoNRE.

percent of GDP. Moreover, there are growing concerns about the impact of climate change on the frequency and intensity of climatic hazards. Strengthening disaster management is a priority for the government. In November 2007, it approved the National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020, with a balance of structural and nonstructural measures. Nonstructural measures, such as community-based disaster risk management measures, which have been implemented in Vietnam since early 2000, will be increasingly important. Indeed, the government has approved a community-based disaster risk management program that is expected to support more than half of the country's communities.

Climate Change

Climate change will bring more varied rainfall patterns and sea level rise.[94] Annual total rainfall is expected to increase everywhere—perhaps by as much as 10 percent in the Red River Delta area by 2050. In contrast, during the dry months, especially in the southern regions (including the Mekong Delta), average rainfall is expected to decrease, perhaps by about 20 percent. Rising sea levels will greatly affect the Mekong Delta and Ho Chi Minh City, parts of the Red River Delta, and also a significant coastal strip, including small estuaries. The mean sea level rise by 2100 is projected by different sources to be about 18–70 centimeters, and 100 centimeters or more is possible through the impacts of high emissions and the melting of land ice. Without adaptation action, a one-meter rise in sea levels would cause more than 9 percent of total land surface to be inundated, with an even greater share of the population affected.

The Reform Agenda

Vietnam has already put in place some key measures for the more effective management of water resources, including a strengthened Law on Environmental Protection, a Law on Dikes, the National Water Resources Strategy, the National Strategy on Disaster Management, the National Target Programme (NTP) for Rural Water Supply and Sanitation, and the NTP to Respond to Climate Change.[95]

Other critical measures are also under development. First, MoNRE is finalizing an NTP on Improvement of Efficiency for Water Resource Protection, Management and Multipurpose Use (hereinafter termed the draft Water NTP), which is based on the main integrated water resources management (IWRM)–related activities recommended in the WSR. The total cost of the NTP over 10 years is estimated at almost 10 thousand billion VND (approximately $500 million). Nearly 60 percent of this is to establish a water resources monitoring system. Approval of this NTP, and its support and implementation by the government with assistance from the international development partners, will be critical for Vietnam being able to embrace locally appropriate elements of IWRM. Second, the Ministry of Natural Resources and Environment is currently revising the Law on Water Resources. The revised law is due to be submitted to the National Assembly for approval in 2011. The following reform measures are aimed at building on these provisions.

Efficient Water Use

Clear and unambiguous specification of water rights[96] contributes to the efficient use of the resource. Under the revised Law on Water Resources a greatly strengthened water rights and sharing framework is being developed. This needs to be taken up and implemented so that all water users operate within a consistent framework. Establishing rights—their term, their coverage, their relationship to other rights, and how they can be changed—is critical to business security and planning in industrial countries. One of the most important tools for implementing a water rights framework is the licensing system, and a strengthened licensing system is being developed for the revised law. This would allow the government to issue rights and also protect the community values of water sources by

providing the tool to manage the potentially damaging activities of water users. An effective licensing system is also one precursor to a water rights trading system, although it may be many years before Vietnam is ready to take its water rights framework to this level.

Planning for the sustainable use and development of water sources is an important aspect of defining rights to water and protecting community values. Resolution of competing interests or conflicts over access to water is best addressed at the river basin scale. River basin planning can be a very powerful integrating measure for water management. It can break down the administrative divisions between governments and between sectors. It provides the opportunity for communities to participate. It can provide the integrating framework for water-dependent socioeconomic development planning and for poverty reduction interventions, in the context of sustainable water resource use. The same is true for groundwater sources.

Many measures for dealing with water scarcity are included in the draft Water NTP:

- Finalizing the legal and policy systems, the standards and norms, and the economic instruments for water resources management aligned with the socialist-oriented market economy
- Completing water resources scenarios for 13 priority and international river basins, based on wet/dry seasons and climate change, and upstream water use scenarios (including for hydropower), and implementing adaptation and response plans
- Signing bilateral and multilateral agreements on cooperation and exchange of water resources data and information, water resources protection, maintenance of environmental flows, and mechanisms to resolve water use disputes and conflicts in international rivers
- Harmonizing and regulating water sources for efficient water use and development of water-saving models; completion of water allocation plans for priority river basins and ensuring the maintenance of environmental flows in rivers; large and medium reservoirs operated to ensure multipurpose use and water resources efficiency.

Vietnam needs a strategic development plan for urban water supply with priorities clearly established for reducing non-revenue water and the provision of new infrastructure. Greater priority should be provided to towns under district control, as they provide alternative destinations for rural-to-urban migration but they lack financial resources and capacity. In addition, a program is required to strengthen the business practices and financial basis of water supply companies. Central to this is higher but realistic and affordable tariffs. As the creditworthiness of

Box 3.3. Improving urban water services: A case study from the Philippines

The Philippine government privatized the state-owned utility for water supply and sewage in Manila in 1997 in response to a crisis situation. A 25-year concession was awarded to Manila Water Company. Since then, the company has almost doubled service coverage to 600,000 households and achieved significant improvements in water quality and availability. Water loss is down from 63 to 35 percent. The results were achieved while maintaining financial profitability.

Source: World Bank 2010b.

the sector improves, access to longer-term local financing will become important. A staged progression should be envisaged over the next 10 years from the current reliance on development assistance through mixed financing to a sector built on local capital markets. Therefore, the preparation of an urban financing plan is also crucial. (See also Box 3.3.)

There is considerable scope to increase food production, enhance livelihoods, and reduce poverty in existing irrigated areas.[97] Irrigation management companies currently have little or no incentives to satisfy customers/consumers (who have little information and even less choice), and performance standards are low (such as water delivery and application rates per unit of output). Decision taking and policy making are almost entirely top-down, and the state's role remains dominant in terms of targets and objectives setting. Therefore, the preparation of a long-term irrigation subsector reform and financing plan is crucial and must be the first step toward creating a long-term viable industry base. This strategy would deal with financial sustainability; modernization needs and service orientation; water productivity improvements; land tenure arrangements; multiple uses, roles, and functions; and environmental targets.

Increasing the efficient use of water will benefit from the development of measures to assess and measure changes in the economic value of water use for different purposes and from a sound water accounting/audit system to support policy decisions, river basin management and planning, and irrigation systems improvements. Auditing and benchmarking will also play a strong role.

Environmental Sustainability

To address water source degradation issues, measures are required that focus on both the resource itself and the many activities that use water and affect the water source.

Resource-focused measures are those that look at the management of the water source. The most overarching of these is natural resource planning. River basin, groundwater, and ICZM planning can effectively set out actions for the management of water pollution in rivers, lakes, wetlands, aquifers, or coastal areas by identifying all possible pressures and options and integrating the consideration of water quality with water quantity and land use activities (via spatial or land use planning). The decisions of one province can have an effect on another, leading to inefficiencies and inequities. This suggests a lead role for central government in these planning initiatives.

The draft Water NTP proposes the development and implementation of plans for water sources protection in 13 priority river basins, as well as groundwater protection plans for the main urban areas, the Red and Cuu Long delta areas, and the central coastal areas and highlands. Other measures focused on the resource could include the identification of water source quality objectives and the classification or zoning of water sources, including the identification and protection of sensitive areas.

The draft Water NTP does not, however, extend to the coastal zone. Yet the coastal zone is facing similar problems as river basins. The cause of these problems can be traced to the same underlying problems that have beset river basin management.[98] And as with river basin management, there is no simple solution to these complex problems, although the Netherlands-funded ICZM projects earlier this decade will provide a lead as to what may work best. Vietnam needs to develop a flexible, integrated, and participative strategy to ensure that the management of its coastal zone is environmentally and economically sustainable, as well as socially equitable and cohesive. The strategy must build on existing programs, complemented by focused new activities, many of which will mirror activities in the river basin, and by support for coordinated ICZM action at all

levels. And mechanisms must also be found to integrate ICZM and river basin initiatives and to deal with sea level rise at the local level.

Activity-focused measures are those directed at activities that use or affect the water source or the coastal zone. The activity of most concern in Vietnam is pollution. Currently it is illegal to pollute water sources, however a major portion of wastewater is dumped into waterways without any treatment. This poses a very grave danger to human health. Addressing pollution from untreated urban wastewater (domestic, hospitals, and urban industrial) is therefore, a priority.[99] Effective price signals are important to convey to water polluters that there is a high cost to their activities.

The scale, complexity, and cost of improving urban sanitation on any significant scale are beyond the scope of provincial and city governments and will require more innovative options. Considering the limited resources and the enormous needs, step-by-step improvements in urban sanitation and wastewater treatment are more appropriate than building up expensive wastewater treatment plants and extensive separate collection systems in only a few areas. Effective reform requires a strategic approach, carefully setting priorities for capital expenditure needs based on a review and ranking of the provinces, districts, communes, and projects. Choices will depend on the socio-geographic environment, population density, and levels of water usage, affordability, institutional arrangements, and access to skills.[100]

Vietnam's environmental report for 2009 reviewed the performance of industrial zones and painted a grim picture of the extent of pollution, the effects on communities, and the flouting of laws and regulations. Efforts to deal with industrial pollution have failed, mostly because of the ineffective application of existing laws and regulations.[101] Strengthening the implementation of existing government decisions, including a revamp of Decision 64/2003[102] (thoroughly handling polluting establishments) and better implementation of Decree 67/2003 (wastewater discharge fees), which so far has been inconsistently and ineffectively applied, will be at the center of any response. But this could be augmented by a more strategic approach that focuses on the pollutants that cause the greatest concern and the industry subsectors that produce those pollutants.[103] Control plans for each of the highest priority industry subsectors should be prepared by linking the discharges with ambient concentrations and establishing least-cost solutions.

The more strategic and stronger use of other management tools will also be important: strategic environmental assessments for a wide range of planning activities; much stronger use of environmental impact assessments; establishment of resource quality objectives and registers of activities that have an impact; wastewater discharge licensing; promotion of environmental management systems for industries; and adoption of best-management practices.

Protecting sensitive lands will play an increasing role. The Mekong Delta needs particular attention as the country's largest granary and seafood source, but it faces a difficult future—especially under climate change projections. In the first five months of 2010, seawater penetrated deep into the delta (up to 50–70 kilometers), affecting thousands of hectares of rice and causing a severe shortage of fresh water.[104] Of more long-term concern is the loss of sediment deposition from the Mekong River—so fundamental to the regeneration and very existence of the delta—that would result from the construction of the mid-river dams currently being considered. The Red River delta will increasingly face similar problems. Vietnam should also identify its major environmental assets, such as wetlands and heritage areas, and establish measures to protect them as a means of protecting biodiversity.

Equity

Water development projects (for irrigated agriculture, for example) have played a major role in poverty alleviation by providing food security, protection from flooding and drought, and expanded opportunities for employment. But poor communities also suffer the greatest health burden from inadequate water supplies. Thus, growing scarcity and competition for water are a major threat to future poverty alleviation. In very dry areas, increasing numbers of the rural poor are coming to see entitlement and access to water for food production, livestock, and domestic purposes as more critical than access to primary health care and education.[105]

In order to bridge the gap in wealth creation, increased investments in water-related projects for pro-poor rural development will be essential. Better rural infrastructure will attract more private investment and thus help counter migration to towns and cities, reducing pressures there and inequities between urban and rural populations. A key element will be agricultural modernization and diversification away from traditional paddy rice. Locally adapted irrigation technologies have succeeded in raising yields using whatever surface water, wastewater, and groundwater was available. There are opportunities for investors to identify successful initiatives and direct funds toward schemes emulating farmers' methods.[106]

A priority must be to build on the successes of the current NTP (rural water supply and sanitation) and to accelerate progress under a new NTP. On the water supply side, greater efforts are needed to increase local capacity for operation and maintenance and to find ways to elicit genuine support for the scheme. People are often reluctant or unable to pay for water supply and, after schemes have been built, people either do not use them at all or use them sparingly, supplementing them with water from unimproved sources, resulting in an unintended overcapacity of the system.[107] This suggests a greater focus on behavioral change under the new NTP and on decentralized and community-based drinking water supply systems, especially in remote areas.

Since water supply itself is insufficient to dramatically reduce disease, sanitation and hygiene behavior changes need much greater emphasis under the new NTP. The measure of success should not only be the coverage (ownership) of sanitation facilities but also the access, use, and upgrading of the facilities, changes in hygiene behavior, and self-sustained demand for more facilities.[108] In addition, uniform and appropriate health standards for both water supply and sanitation (rural and urban) are required.

Natural hazards have a major impact on all communities, and the central region's river basins bear the brunt of the damage. Flooding generally causes the biggest losses, and dealing with flooding issues has to be considered on a fully integrated river basin and coastal zone basis. Central Vietnam should be the priority for the preparation of natural hazard management plans, with a focus on nonstructural measures, including community-based disaster risk management approaches.[109]

A major social concern for water resources management relates to the social impacts of dam construction, including relocation of communities and loss of cultural values. In Vietnam, the proposed hydropower projects have provided a focus for dealing with this issue. In a positive move, the concept of "benefit sharing" is being examined[110] and is likely to be formally adopted by the government. This is a significant development, given the large number of new hydropower dams being planned.

Measures to Support the Reform Agenda

This chapter has shown that the economic boom that Vietnam is experiencing is far outstripping

the capacity of the support infrastructure, governance, and management of water resources and the environment. To redress this, and to facilitate the reform agenda just outlined, the following initiatives are recommended. Many of these are aligned with the draft Water NTP.

- Institutional arrangements:
  - The evolution of the market economy requires the role of government to change. Governance needs to be separated from day-today-management and implementation and from a direct implementing role to a role as national "market overseer" [111]
  - The performance of subnational governments is central to the effectiveness of IWRM and ICZM and to water service delivery, as much of the practical implementation is in their hands; accountability requires transparency and public access to performance data, which will require a cultural shift but also considerable support in introducing revised processes and acquiring new skills[112]
  - The *Vietnam Development Report 2010* refers to the Provincial Competitiveness Index;[113] this could be complemented by the establishment of a Provincial Sustainability Index to ensure that provinces are not sacrificing natural resources and the environment for short-term economic benefits
  - Stronger arrangements for the operation of the National Water Resources Council are required,[114] as well as strengthened institutional arrangements for urban water service delivery[115]
- Data and information: providing accurate and reliable data and information for more-effective decision making
- Capacity development: at all levels (particularly for provinces) for the implementation of IWRM approaches and for key technical areas (such as wastewater treatment)[116]
- Stakeholders: involvement of stakeholders in river basin planning and involving farmers in irrigation scheme decision making
- Education: water education programs carefully targeted to community behavior.

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CHAPTER 4

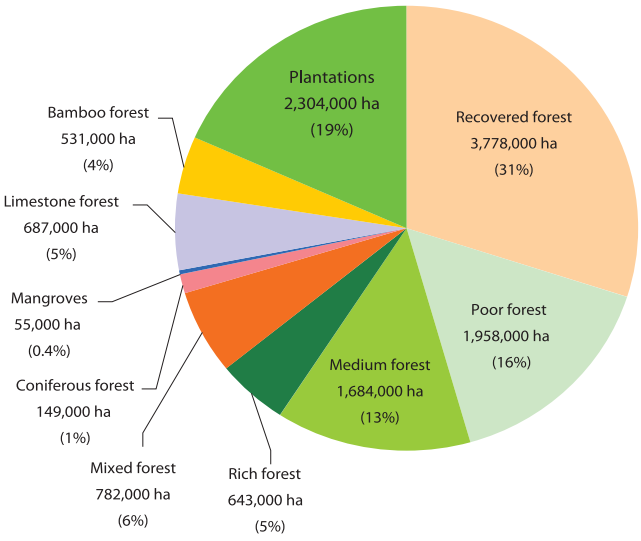
FOREST MANAGEMENT

Vietnam's forest landscape has changed dramatically over time: overexploitation and conversion to other uses have eroded the forest resource and depleted its biodiversity. Almost two decades of afforestation programs have reversed the decline in forest cover, but degradation of natural forests continues. And while species of fauna and flora new to science are still being recorded, the number endangered is growing.

Devolution in the forest sector has provided local people with use and management rights. However, rates of poverty in forested areas remain high, particularly among ethnic minorities in the remote uplands. The economic contribution of the forest sector to the gross domestic product is low, but it would be significantly higher if environmental services were taken into account. The dramatic growth of the wood industry has brought economic benefits, yet demand for timber motivates illegal trade, which poses a threat to forests in the region and the future of the industry.

To address these issues, a comprehensive set of reforms are outlined in this chapter. These include more-effective devolution of forest protection and development to private actors, with incentives for sustainable management; enhancing forest law enforcement and governance mechanisms to improve social equity and environmental sustainability; and information and forest management systems to provide robust bases for policy formulation, planning, and multiple-use management. Not only are these reforms necessary for reasons of efficient utilization, greater social equity, and environmental sustainability, they also address many of the conditions necessary to benefit in the future from international transfers for carbon sequestration services.

Figure 4.1. Area of forest by type, 2005



Source: **MARD 2008.**

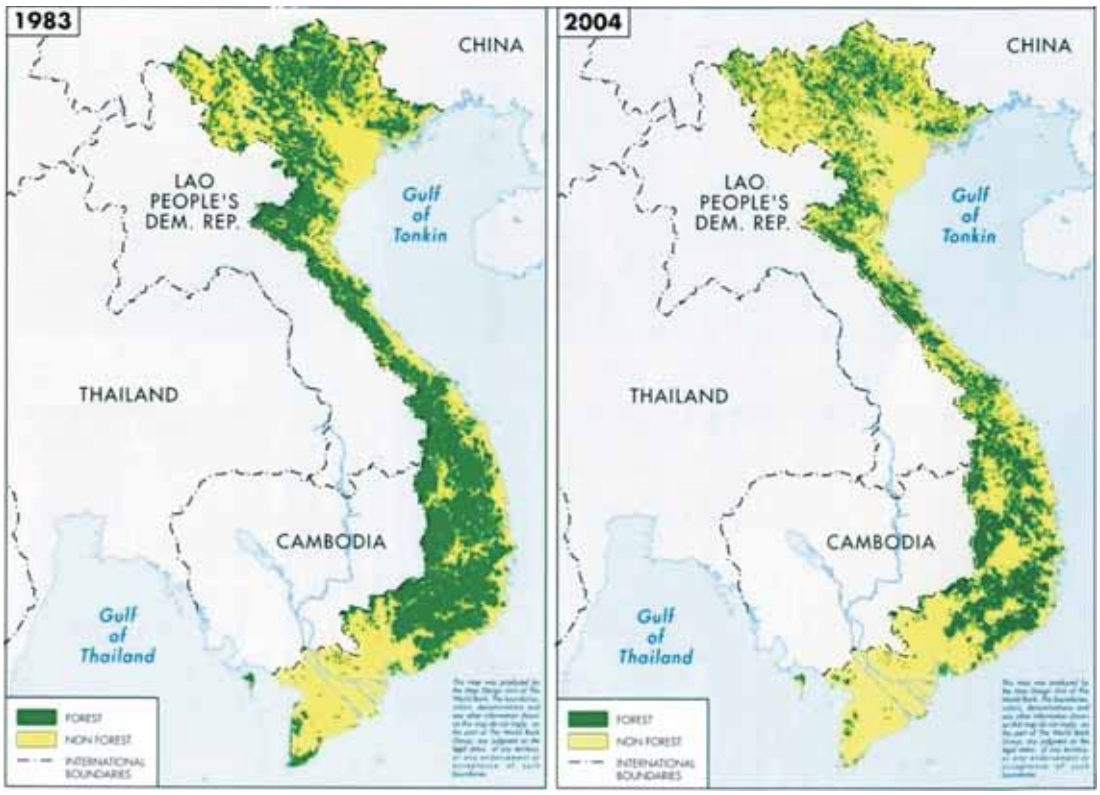
Vietnam has some 16 million hectares (ha) of officially designated forestland, of which about 13 million ha are actually forested.[117] The remainder consists of bare land and denuded hills.[118] Of the forested land, about 10 million ha are classified as natural forests (although very mixed in structure) and almost 3 million ha are plantations.[119] (See Figure 4.1.)[120]

Forestland is managed according to one of three functional categories: special-use forests (SUF), which cover almost 2 million ha; protection forests, at almost 5 million ha; and production forests, about 6 million ha.[211] The country's complicated topography and climate explain its diversity of natural forests, ranging from sea level to over 3,000 meters, including evergreen and semi-evergreen broad-leaved forests, semi-deciduous and dry deciduous forests, mixed evergreen coniferous forests, and mangroves.

The forest landscape has changed dramatically over time. (See Figure 4.2.) Several decades of intense exploitation and conversion saw forest cover decline from 43 percent in 1943 to about 27 percent in 1990, but then approaching 40 percent in 2009. The loss of mangrove forests has been and continues to be particularly acute, from 400,000 ha in 1943 to less than 60,000 ha in 2008.[122]

In 1992 the government commenced a series of ambitious afforestation programs to promote tree planting on "barren hills"[123] and to protect and enrich existing forests.[124] Planting, mainly

Figure 4.2. Vietnam forest cover, 1983 and 2004



Source: **World Bank 2005.**

with fast-growing and often exotic species, and protection to assist regeneration of natural forests has increased forest cover to almost 40 percent.[125] The estate now comprises natural forests (assorted in terms of species composition, structure, and quality) (see Figure 4.1) and reforested areas of low biodiversity value.[126] And despite the increase in area, degradation, in particular of natural forests, continues.

Institutional Perspectives

Policy Perspectives

Vietnam's Socio-Economic Development Strategy 2001–2010[127] provides several development objectives for the forest sector: increase overall forest cover to 43 percent, complete the allocation of forestland to socialize forestry development and promote forestry-based livelihoods, stabilize cultivation practices and prevent the destruction and burning of forests, and accelerate commercial reforestation to provide material for domestic and export-oriented industries. These objectives are elaborated within the five programs of the Vietnam Forestry Development Strategy 2006–2020,[128] which sets ambitious targets for forest development and for management, policy, and institutional reforms. The cost of achieving these is estimated at $400 million annually over the 14 years of the strategy. However, current investment levels from public and private sources are only $50–60 million annually.[129] Acknowledging this shortfall, the strategy introduces market-based approaches to sector financing—strengthening incentives and the enabling environment for private actors.

The government's main policy for forestry investment since 1998 has been the Five Million Hectare Reforestation Programme (also known as Program 661).[130] This has had mixed results compared with its ambitious targets.[131] Although the target for protection forest (3 million ha) was largely met, the one for production forest (2 million ha) was not.[132] Also, weak planning, budgeting, and control provisions presented enormous opportunities for fraud and corruption at various levels.[133] Following a national review, the program was amended in 2007[134] and a new Policy on Production Forest Development[135] was introduced to provide subsidies for growing timber and support for forest infrastructure and extension services.

The new Directorate of Forestry under the Ministry of Agriculture and Rural Development (MARD) is responsible for developing forest policy and providing oversight and guidance for implementation. Line agencies at provincial and district levels are responsible for administering forest protection and development. However, decentralization efforts in the sector remain rather nominal. Furthermore, development of effective forest policy is surely constrained by the lack of high-quality and consistent data.[137]

Economic Perspectives

The forest sector contributed just 1 percent of gross domestic product (GDP) in 2005.[138] But this does not include forest product processing and unrecorded forest product consumption. Furthermore, public goods such as environmental services provide a value by some estimates several times greater than the timber resource—when including the value of soil protection, water regulation, and carbon sequestration provided by natural forests.[139] In addition, researchers have shown that the average value of non-timber forest products in Vietnam's natural forests is about 2 million VND per hectare[140] (in total some $1 billion).

Forestry consumes 20–25 percent of public expenditure in agriculture/forestry, while it contributes only 4 percent to the output of that sector.[141] However, this figure does not reflect the full value of forest services, and the larger part of investment under Program 661 has been in non-commercial forestry for protection and conservation. Furthermore, the benefits of forestry investments are seen in the longer term—between 5 and 15 years (or more),

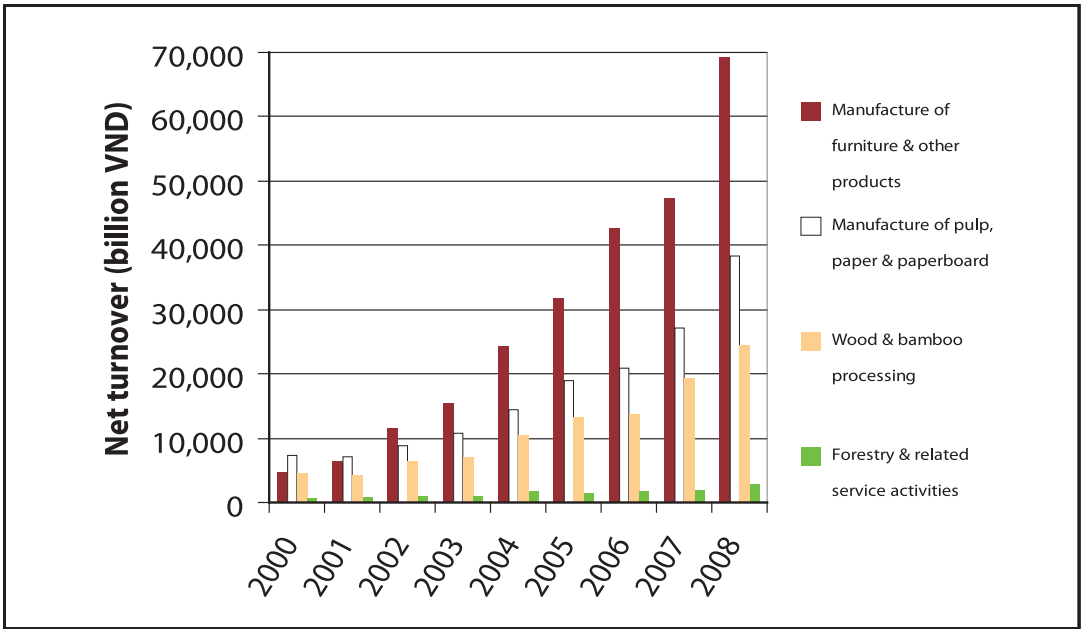
depending on species and production objective.

Potential exists to improve productivity of the sector: average plantation yields at 4–12 cubic meters per ha per year are at least 50 percent less than their potential.[142] Some 3 million ha of forestland remains bare, and local people often lack the resources necessary to put their land into production;[143] natural production forests are either closed for harvesting or exploited under a quota system that removes the incentive for sustainable management.

Timber production consistently dominates other interests as it is easier to quantify than biodiversity conservation and environmental protection functions. But nascent markets for ecosystem services exist, with national piloting of payments for forest environmental services (PFES), and private piloting of carbon-financed forest protection.[144] These efforts have received a recent boost with the issuance of a Decree on the policy for PFES.[145] This defines the market actors and lays down principles for determination of payments and an institutional mechanism for handling the transactions. However, weaknesses in forest law enforcement, governance, and monitoring will need to be overcome to fully realize the potential of such pilots and to ensure that forests are maintained and their biodiversity protected.

Vietnam's wood processing industry has grown dramatically[146] (see Figure 43), with exports of $2.8 billion in 2008.[147] The industry enjoys competitive advantages as a contact manufacturer, a sector of the global furniture industry characterized by low profit margins resulting from intense low-cost competition and indirect access to markets.[148] Some firms are upgrading toward their own design manufacturing, but much work is still to be done to build a long-term, internationally competitive wood processing industry.[149] The challenge for the pulp and paper industry is even greater, with imported paper from Indonesia cheaper than

Figure 4.3. Turnover of forest sector enterprises, by type of activity



Source: General Statistics Office.

that produced by the most efficient mill in Vietnam.[150]

Adding output from wood-based products, the total contribution of the forestry sector to GDP rises to over 5 percent.[151] This is a notable achievement for an industry that currently imports some 80 percent of its raw materials.[152] Domestic sourcing remains a struggle for this industry: private investment in timber plantations is difficult,[153] and farmers allocated land are less willing to grow sawlogs, and they tend to produce different products at different times.[154]

Of the 2,500 wood processing enterprises in Vietnam, some 500 export wood products.[155] Only about 200 of these have Forest Stewardship Council (FSC) chain of custody certificates,[156] indicating sizable use of imported wood (particularly plantation-grown eucalyptus and acacia) from well-managed forests.[157]

Strong market demand from the industry for cheap raw material motivates illegal trade from both domestic and external sources (with imports of logs from Lao PDR and Cambodia being particularly controversial),[158] and weaknesses in forest law enforcement and governance mean that such trade can flourish.[159] New legislation that bans illegally sourced timber and wood products in Vietnam's main markets (the Lacey Act in the United States and Due Diligence Regulations in the European Union) could soon have a major impact unless the government and industry take appropriate action, such as putting in place the systems and controls necessary to conclude a Voluntary

Box 4.1. New rules for woods-based exports: EU Partnership Agreements and the US Lacey Act

In July 2010, the European Parliament approved the EU Timber Regulation (formerly known as the Due Diligence Regulation). This requires timber traders to exercise "due diligence" when selling timber on the EU market and prohibits the sale of illegally harvested timber in the EU. It is expected that the regulation will become applicable in all EU member states in 2013.

Timber from FLEGT (Forest Law Enforcement and Trade) partner countries will be considered to meet the requirements of the Timber Regulation: the FLEGT Voluntary Partnership Agreements (VPAs) with these countries establish procedures that ensure that only timber products derived from legally harvested timber are sold on the EU market. In August 2010 the EU and Vietnam agreed to start negotiations for a FLEGT VPA. Implementing the FLEGT VPA will enable Vietnam's timber producers to adapt to the EU legality requirements and will improve the position of Vietnamese timber on the EU market.

A common element to all VPAs is that producing countries put in place credible control systems to verify that timber is produced in accordance with national laws. This implies:

- A commitment to ensure that the applicable forest law is consistent, understandable, and enforceable and that it promotes sustainable forest management
- Development of technical and administrative systems to monitor logging operations and identify and track timber from the point of harvest and point of import to the point of export
- A commitment to improve transparency and accountability in forest governance
- Checks and balances built into the tracking and licensing system, including the implementation of an independent monitoring system

- Development of procedures to license the export of legally harvested timber.

Vietnam is a regional and global wood processing hub. It has the United States, EU, and Japan as its main end markets for timber products and is thus highly sensitive to the legality requirements of these markets. Vietnam is also dependent on the imports of raw timber from many other timber producing countries.

Next to the EU Timber Regulation, a number of other consumer countries have similar legislation or are in the process of developing legislation against the trade in illegally harvested timber: the United States was the first to take such measures by amending the Lacey At in 2008 to make it illegal to import, trade, or transport illegally harvested wood and wood products. The Lacey Act places the burden of proof of illegality on the U.S. government, and it covers all types of wood-based products (including pulp, paper, and furniture). The amended act includes import declaration requirements for information on:

- The scientific name of any plant (including the genus and species names) contained in the importation
- The value of the importation and the quantity, including the unit of measure, of the plant
- The name of the country from which the plant was taken.

If this information is not available in a producer or processing country like Vietnam, access to the U.S. markets will be denied.

Also, Australia is in the process of developing legislation against the trade in illegally harvested timber, while Switzerland is introducing an import declaration. A growing number of countries have developed public procurement policies that aim to avoid using illegally harvested timber in public projects.

Source: EC 2007; EFI 2008, 2009; EU 2010; ITTO 2010.

Partnership Agreement with the European Union, which the government has started to negotiate (see Box 4.1).

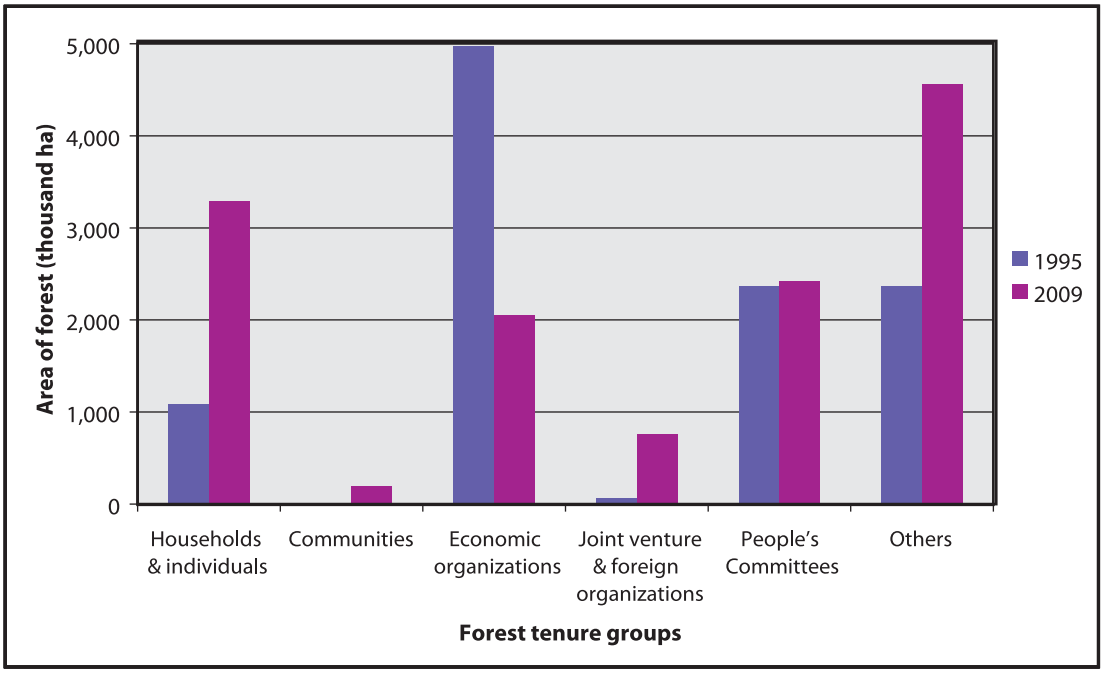
Social Perspectives

An estimated 25 million people live in or near forests, including many ethnic minorities living in mountainous and remote areas where poverty rates are high. The poor tend to have a higher reliance than the non-poor on forest resources for meeting their basic needs, for obtaining "gap-filler" income between agricultural harvests, and for providing a "safety net" in the event of emergencies.[160] Despite significant achievements in poverty alleviation in the country as a whole, high rates of poverty in areas with natural forest remain, particularly in the remote uplands.[161] The contribution of the forest sector to poverty alleviation is unclear. Despite large investments in Program 661, the evidence suggests that it has had little direct beneficial impact on the incomes of the poor. [163]

New forest and land laws issued in the wake of doi-moi initiated the devolution of forest use and management rights to non-state actors.[164] (See Figure 4.4.) Since then the area of forestland allocated to local people has expanded from almost nothing to 3.5 million ha in 2006.[165] Forestland allocation has generally been a top-down process, however,[166] and outcomes have been afflicted by inefficient and inequitable allocation[167] of mostly degraded or bare land.[168] This is exacerbated if local institutions, through which people can voice concerns and share information, are lacking,[169] and access to and understanding of policies and laws are deficient.[170]

After 10 years of piloting community forest

Figure 4.4. Forest tenure change in Vietnam between 1995 and 2009[171]



Source: Nguyen Ba Ngai et al. 2009; Nguyen Ba Ngai, personal communication, 2010.

management (CFM), revision of the forest law in 2004 provided for the allocation of forests to communities. But CFM remains a pilot process,[172] with few areas of mostly poor forestland allocated with support of donor projects in selected provinces. CFM is yet to become a mainstream initiative. It is a model with potential, however, for implementing Reducing Emissions from Deforestation and Forest Degradation Plus (REDD+),[173] particularly in light of the conservation activities at village and commune level, and it is promoted as such by MARD and donors. [174]

The Vietnam Forestry Development Strategy 2006–2020 seeks to promote socialization of the forest sector, encouraging non-state actor tenure and resource access. Most forestland, and the best forests, remain under state control, however, leaving local people disadvantaged by a lack of co-management opportunities and unclear benefit sharing mechanisms—a situation that is beginning to be addressed with the preparation of a decision on piloting of these mechanisms.

The reform of state forest enterprises (SFEs) has released relatively little forestland for allocation to households.[175] This process commenced in 1999 but continues at a very slow pace that reflects the depth of underlying complications and intransigencies. Although SFEs have been changed to become state forestry companies (SFC) to be established and operate under the Enterprise Law,[176] many remain dependent for their survival on subsidies and fees from Program 661.[177] Proven business models for restructuring the SFCs are needed, to provide for sustainable management of forests and benefits for the local and wider economies.

Biodiversity Perspectives

In 1992 the World Conservation Monitoring

Centre evaluated Vietnam as one of the 16 most biologically diverse countries in the world.[178] (See Table 4.1.) Species new to science have been discovered over the past 20 years.[179] However, the number of species becoming endangered is increasing. Now more than 300 plant species are at risk, with populations declining mostly due to deforestation and shifting cultivation,[180] and about 400 species of fauna are at risk, mostly as a result of habitat loss and hunting.[181]

The area of natural forests of high biodiversity has declined considerably. Only about half a million ha of primary forests remain—scattered in the Central Highlands, the southeastern region, and northern Central Vietnam—and primary mangrove forests have almost vanished.[185] Vietnam has 128 SUFs, which comprise its protected area system.[186] Most are small and fragmented, and some also include areas of agricultural and residential land. The large charismatic bird and mammal species have been lost from most. Many now suffer a continuing decline in quality rather than extent of habitat, and the unrestricted and widespread practice of infrastructure development within them threatens their viability.[187]

The protected area system suffers as a result of physical and administrative fragmentation. (See Box 4.2.) The former makes it difficult to conserve biodiversity and results in high per-hectare management costs,[188] and the latter weakens the authority and effectiveness of management, as responsibilities are divided across ministries and between administrative levels. A more unified protected area system is needed to avert the risk of more SUFs becoming paper parks.[189]

Despite comparatively high levels of funding (at least for the centrally managed national parks), SUFs face major financial problems, which translate into serious management constraints.[190] These are intensified by institutional problems[191]

Table 4.1. Species richness and threat status in Vietnam in 2005

Taxonomic group	Species in Vietnam [182]	Percent of global species foundin Vietnam	Nationally threatened[183]	Globally threatened[184]
Mammals	310	8	78	46
Birds	840	9	83	41
Reptiles	286	5	43	27
Amphibians	162	4	11	15
Fish	3,170	11	72	27
Invertebrates			72	not evaluated
Plants	14,000	6	309	148
Fungi			7	not evaluated
Algae			9	not evaluated

Source: World Bank 2005.

Box 4.2. Responsibilities for protected area management

Responsibility for protected areas is divided among several agencies. MARD and its provincial departments are responsible for all special-use forests, and the Vietnam Environment Protection Agency within the Ministry of Natural Resources and Environment (MoNRE) is responsible for Ramsar wetlands.

Within MARD, the Directorate of Forestry has responsibility for the overall management of the SUF protected area system, and direct responsibility for the management of six national parks. The provinces manage the other national parks as well as all nature conservation areas and cultural-historic-environmental sites. Agencies responsible for managing these areas are the Departments of Agriculture and Rural Development, the Departments of Science, Technology and Environment, the Forest Protection Departments, the Fisheries Departments, and the Departments of Culture and Information; arrangements vary, depending upon the type of SUF and from one province to another.

SUF management boards have authority only within a park or reserve. In the buffer zone, management decisions are made by district and commune People's Committees, State-Forest Enterprises, provincial Departments of Agricultural and Rural Development, and the Department of Land Administration.

and limited inter-agency cooperation.[192] Engagement with local communities mostly involves contracting for forest protection—a mechanism that (moderately) compensates for loss of access rather than incentivizes management.[193] Co-management—the sharing of management functions, benefits, mandates, and responsibilities between management boards and local people—does not yet exist in SUFs.

Vietnam's legal system incorporates a large number of globally accepted principles on environmentally sustainable management, and it is one of the few countries with a biodiversity law. In practice such provisions are minor considerations in land use and infrastructure planning decisions. Also, effective law enforcement is hampered by weak cooperation between agencies and by deficiencies in interpreting and applying ordnances.

Major Issues in the Forestry Sector

The main direct causes of deforestation are conversion to agriculture and infrastructure development. Illegal logging, overexploitation, and forest fires are major causes of forest degradation and often precursors of deforestation. The indirect or root causes are related to the speed and type of economic growth, changes in markets, and broader issues of governance and policy. [194]

Global drivers of change in the forest sector include changes in international market demand for forest goods and services, including climate change mitigation, with potential for both adverse and beneficial impacts:

- REDD+ (see Box 4.3) offers an incentive for changing the way forest resources are used—curbing carbon dioxide emissions through paying for actions that prevent forest loss or degradation—but there are concerns that use and management rights of forest-dependent communities could be weakened.
- Responsible timber traders are active in promoting supply chain and forest management reform, while others are driving illegal logging.

Vietnam has a good potential for plantation

development, the opportunity for productive natural forest management, and the basis for a dynamic wood industry. But performance and sustainability across the sector is hampered by low productivity of planted forests and by weak incentives and support to put allocated land into production. Devolution has been driven by quantitative target-oriented planning, with less importance placed on process quality that could have delivered greater social equity through good forest land use planning, more democratic and transparent land allocation process and decision making, and post-allocation support and services to new forestland-holders.

Forest development in Vietnam has focused on achieving centrally set targets, in particular for afforestation. Sustainable management is piloted but not wholly practiced in natural forests, and these continue to be degraded as threats to species, habitats, and a well-functioning forest ecosystem intensify. Vietnam might end up as a country dominated by stands of acacia, pine, and eucalyptus—with a great loss of biodiversity and a heightened risk of climate induced calamities (such as storms, fires, and insect infestations) in more vulnerable monocultures.[195]

The Reform Agenda

Issues affecting the sector are inextricably linked to and affected by polices and events in other sectors[196] and other countries.[197] Clearly the process of policy reform needs to be coordinated across affected sectors, with implementation better coordinated among relevant agencies. Key priorities for the future should be to:

- Disentangle private sector and state functions, with the key role of forest sector institutions being to facilitate forest management by private actors (see Box 4.4)
- Decentralize implementing authority and build capacity for service delivery at lower levels
- Devolve use rights and management responsibilities, ensuring that poor forest-dependent minorities and communities are able to derive real benefits from management of allocated forestland
- Reform forest policies and management systems to create adequate and effective incentives for private actors to sustainably manage forests[198]

Box 4.3. National REDD + Program

In 2005 a plea was made to consider existing forests as a mitigation measure under the United Nations Framework Convention on Climate Change (UNFCCC). At the 13th Conference of the Parties to the UNFCCC, a decision was adopted that called on Parties to develop proposals for the establishment of a mechanism for Reducing Emissions from Deforestation in Developing Countries. Over time this mechanism has evolved to include five eligible activities and it is now referred to as Reducing Emissions from Deforestation and Forest Degradation in Developing Countries; and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries (REDD+).

The REDD+ mechanism is likely to become part of the new climate agreement as of 2013. In the meantime there are several initiatives to help developing countries establish national REDD+ programs; the Government of Norway is particularly active in supporting REDD+ establishment. Vietnam was the first country to implement a national UN-REDD Programme ($4.3 million) and part of the first group of countries to be accepted for funding through the Forest Carbon Partnership Facility of the World Bank ($3.6 million). MARD is currently developing its National REDD Program, with support from the UN-REDD Program.

- Strengthen governance and law enforcement mechanisms necessary to underpin sustainability
- Bring the role of forests in greenhouse gas mitigation and climate change adaptation into full play within strategies and planning of relevant sectors
- Facilitate policy consultation and learning from pilot initiatives together with key stakeholders to efficiently identity solutions and implementation arrangements.

Governance and Institutional Reforms

Reliable and adequate information (in terms of disaggregation, frequency, and transparency) is needed to provide an appropriate basis for policy decisions and to improve implementation effectiveness. To improve data quality and consistency in the forestry sector, the following recommendations should be taken into account:

- Effective coordination among ministries and agencies is required to develop a system and agree upon standards for data collection, measurement, and compilation, in order to make information comparable in time, space, and across organizational boundaries.
- Clear roles and responsibilities for data collection, compilation, and publication between ministries and agencies need to be established, and capacities strengthened.
- Modern information technologies should be introduced for reporting, monitoring, and compilation processes and to facilitate public dissemination and analysis.

In addition, improved systems and capacity for forest inventories and monitoring will be necessary to provide the information basis for managing forests sustainably (see Box 4.5), to assess performance linkages for PFES and REDD+ payments, and to identify social and environmental outcomes.

Interagency cooperation is a primary condition to enable effective forest law enforcement. Such cooperation needs to improve dramatically to deal effectively with the forest crime challenge,

Box 4.4. Evolution of forest sector institutions

Government forestry departments traditionally integrated multiple public and private functions. Challenges of reduced public expenditure, mounting expectations of different stakeholders, and increasing conflicts over the use of forest resources are stirring public agencies to rethink their roles. The evolution in focus can be loosely described as moving from policing the forests to managing them to facilitating management by others.

In some cases, reform has been superficial, limited, for example, to changes in ministerial responsibility or to structural but not functional change. Strategies used in more successful transitions to an enabling role have included:

- Separating policy and regulatory functions from management functions
- Entrusting wood production and processing to an independent commercial government entity or privatizing all commercial activities
- Decentralizing and devolving management responsibility to the local level, usually as part of a larger program of political and administrative decentralization.

Source: FAO 2009.

Box 4.5. Forest information management

MARD has embarked on an effort to integrate data and information on forest resources, management, and economic activities. The Forest Information Management System (FOMIS) has been an early attempt at collating, integrating, and publishing such information. This is being strengthened, with support from the FOMIS project, to provide a more professional basis for the management of data that underlies FOMIS and to enhance opportunities for application in forest management, such as for the elaboration of provincial forest development plans.

The 4th National Forest Inventory (NFI) will be completed in 2010. A new approach to the NFI has been developed through the National Forest Inventory and Monitoring Program (NFIMP), which will see information management based in MARD rather than the Forest Inventory and Planning Institute, as in the past. The new NFIMP is expected to be endorsed by the government before the end of the year.

The National REDD Programme is developing a system for Monitoring, Reporting, and Verification (MRV), as required by the UNFCCC. The MRV system will collect data on forest resources from participants in the REDD+ mechanism, as well as from secondary sources such as the NFI. The MRV system will generate the reports upon which Viet Nam will receive funds for reducing emissions and enhancing removals. A benefit distribution system to deliver payments to participants will use the MRV as its primary "evidence" of performance. The MRV is expected to provide information for other uses as well, as it is likely to become the most comprehensive database on forest resources and users.

MARD would like to see all three systems—FOMIS, NFI, and MRV—integrated into a single source of information on forest resources in Vietnam.

which will require strengthened cooperation at all levels:

- Systems of cooperation are needed between MARD, the Ministry of Justice, and the General Department of Customs to identify changes needed in the legal framework.
- New local-level approaches are needed, such as revised institutional working relationships between the Forest Protection Department and enforcement agencies.
- Interagency cooperation at the international level can prevent imports of illegally sourced timber and wildlife; systems need to be in place for sharing data and working jointly with counterpart agencies in exporting countries.

Sustained access to international markets for the wood processing industry will require procurement of verified legal timber originating from well-managed forests, whether domestic or imported. Government and the private sector should put in place effective due diligence measures for sourcing raw material. This will require an agreed definition of legal wood, systems for verification of legal origin and compliance, and effective chain-of-custody management. In addition, enforcement efforts should be focused on the point-of-sale of illegal forest products—sawmills, wood processors, and export points. The basic elements of this approach would require a licensing system for wood processors and traders, an enforceable requirement to demonstrate legality of raw material, systematic and concerted inspection by trained forest enforcement and customs officials, and strong legal sanctions for the unlawful possession of wood. A similar approach should be also applied to combat illegal wildlife trade, focusing on markets and restaurants selling wildlife products.

A very preliminary (and likely conservative) estimate of REDD+ revenues, based on low-

resolution remote sensing estimates of forest cover change over the period 2000–05 and Intergovernmental Panel on Climate Change carbon density estimates, suggests that Vietnam could earn some $80–100 million a year[199] provided international agreement is reached under the UNFCCC. REDD-preparedness is happening and pilots are being planned, but this could only be realized if the government takes steps to ensure that REDD+ is implemented effectively. This will involve developing a comprehensive REDD+ strategy to generate and sustain emissions reductions at the local level, developing the necessary capacity to measure and report on emissions reductions, and putting in place a benefit distribution system that meets the expectations of the international community in terms of equity, transparency, additionality, performance, and accountability. (See Box 4.6.)

Effective implementation of REDD+ will also require actions to ensure permanence of forest carbon storage by strengthening forest law enforcement and governance mechanisms so that tenure is assured and forests protected, along with actions to address leakage that could result from the demand for raw material having a negative impact on forests in neighboring countries. Policy incentives need to be designed so that adequate reward is given to the provision of non-market benefits of forests.

Introduction of a multiple-use management approach will require district and commune-level support for forest planning, monitoring, and extension. This will require reform of the forest protection force to become a more technical supporting agency for forest development, able to facilitate the shift from state to private forest management through cooperative action that supports implementation by those who hold forestland.

Efficiency Reforms

Appropriate solutions for forestland accumulation that improve raw material supply and deliver benefits to local people are necessary. This could be in the form of leasing arrangements to enable enterprises to lease

Box 4.6. The Forest Carbon Partnership Facility (FCPF) in Vietnam

The REDD+ agenda drives an important reform process. Analyses conducted in the framework of the preparation of the Readiness Preparation Proposal for submission to the Forest Carbon Partnership Facility highlighted six recommendations to reduce deforestation and forest degradation.

First, it calls for assessing current sectoral development plans both nationally and provincially to identify plans which are likely to lead to high forest loss. Second, it calls for secure forest use rights to households, or communities, with the expectation that this will provide incentives for them to protect the forest area assigned to them. Third, it calls for modifying a number of policies including, for example, the current logging ban and the system for granting permits for afforestation on degraded forest lands', including the process of classification of degraded land. Fourth, it recommends proper execution of high quality EIAs which would help mitigate development projects which are likely to occur in high forest loss. Fifth, it recommends providing support in certain areas, such as more intensive agricultural cultivation, encouraging production of higher-value crops and vocational training for off-farm income opportunities. One area of particular importance concerns alternatives to slash and burn agriculture. Sixth, it calls for financial transfer mechanisms which would enable forest-using communities to have real and reliable incentives.

Source: GoV 2010b.

blocks of forestland from multiple landholders; outsourcing arrangements (such as implemented by VINAFOR[200]), in which enterprises contract with farmers to plant and grow material primarily for their consumption; or a refined outsourcing arrangement (such pioneered by LASUCO[201]), where farmers also have the possibility to become shareholders in the processing facility they supply. (See Box 4.7.)

It is not realistic to assume that Vietnam's timber consumption can be met from domestic sources.[202] But the wood processing industry could drive the development of (certifiable) well-managed forests—especially plantations. Formulation of a national Wood Production and Industry Development Plan could provide a blueprint for more integrated development of material forests and the processing industry. This would identify a limited number of locations where substantial areas of plantations could be developed consistent with raw material requirements. Also, incentives and the enabling environment should be strengthened to encourage private investors that can bring the best available technology and resources to the sector.

Key objectives of the SFE reform process[203] are still to be fully realized; most enterprises have just changed their titles without many changes in nature.[204] Urgent reforms are needed to unlock the potential of these forests. This could be achieved by allocating to communities to

Box 4.7. Smallholder group management scheme

Smallholders growing trees on allocated land often seek an early return with the production of low-value small-diameter wood sold through agents to the chip and pulp industry. The potential exists to better coordinate and manage this resource, providing benefits in terms of sustainability of the forest and better income for local people. One such example has been developed in Quang Tri province, where the World Wide Fund for Nature (WWF) has facilitated the establishment of a Smallholder Group Management Scheme. This has just received FSC certification awarded in recognition of responsible management in accordance with globally established social and environmental criteria.

The smallholder group started off with 125 households, with individual plots ranging from 0.5 to 8 ha, which formed themselves into five village groups each with an elected leader. Additional farmers can apply to the group and be admitted after an internal assessment of the applicant's compliance with the group's management regulations.

Under the group scheme, individual household members manage their forestland in accordance with a simple forest management plan aiming at the improvement of the economic and environmental value of the stands. The implementation is supported and monitored by a Group Manager (currently WWF, but in the future the Forestry Sub-Department within Quang Tri DARD). This has improved coordination and management, resulting in tangible benefits:

- Coordinated management, harvesting, and marketing, with the possibility to offer larger volumes and negotiate directly with potential buyers
- Joint procurement, leading to cost savings for inputs such as seedlings
- Planting of native trees to enhance the environmental functions of buffer zones along water bodies
- Potential group investment in processing and loans to group members for forest stand improvement.

The forests now planned for harvesting were established on bare land with assistance from KfW some 10 years ago. With the sale of larger-diameter timber, the smallholders will realize two types of premium: one from selling sawlogs directly to the value-added processing industry, and the other from certification, which is providing a 10–20 percent price improvement.

The group provides a focus for training and advisory support and potentially the basis for a public-private partnership with a responsible buyer from the furniture industry. It also offers a model that could be replicated in other areas. In collaboration with the IKEA company, WWF is exploring opportunities to expand the scheme to more than 7,000 ha in Quang Tri by 2012, with private investment rather than donor funding, and in so doing contribute to the government's target of 30 percent of production forests being certified by 2020.

Source: Tim Dawson (consultant to the VDR) and Sebastian Schrader (WWF).

support local livelihoods, leasing to users in a position to invest properly in forest management and protection, or forming new social enterprises between existing SFCs and local stakeholders.

The potential exists to improve the productivity of planted forests. Gains could be achieved from the more rapid deployment of clones, hybrids, and new species and provenances; the policies and legislation on plant material need to be reviewed to ease and speed deployment of superior material. Also, species-site matching should be improved through a system for site classification that takes account of soil type, vegetation with indicator plant species, microclimate, and water availability. Furthermore, a network of decentralized nurseries should be established to promote both exotic and local indigenous species, while nursery advisory centers should be set up as living extension centers where planters can purchase material and obtain advice. There needs to be a major coordinated effort in research, training, and extension to support improvements in the quality and productivity of forest resources and viable management systems. This will require greater coordination and collaboration between research institutes and forestry-related service agencies, appropriate investment in forestry research and extension, a research agenda driven by the needs of forest users, and participatory techniques to ensure that proposed technologies are tested on the basis of criteria that are important for users.

Equity Reforms

Community-based forestry can provide more-sustainable and beneficial means of management and protection than current practices in certain situations by, for example, providing a means to develop the local economy in mountainous areas, protecting and developing coastal mangroves for the benefit of local people and the environment, or conserving biodiversity through co-management within SUFs. (See Box 4.8) To achieve these outcomes, a "basket" of community-based management methodologies, providing improved individual, community, and co-management rights and responsibilities, should be available to be implemented according to social and environmental needs and the strictures of existing forest ownership and classification arrangements. This would require:

- Lessons learned from piloting community forestry to be absorbed and appropriate national policies developed that can enable allocation of (more) suitable forestland to local communities
- Formalization of co-management arrangements, enabling representatives of local communities to have a role within the management boards of SUFs and protection forests and providing community members with rights and responsibilities to meet their needs while maintaining forest management objectives

- Clear benefit sharing arrangements that help meet local needs and in turn provide the incentive for protection and sustainable management—the current (short-term) contracting of forest for protection to households should be replaced by long-term performance-based financing, such as that piloted under the PFES scheme
- Commitment from leadership to put in place a policy frame at the national level and technical guidelines at provincial levels in line with national decentralization efforts, along with technical and financial support to local communities for implementation.

The forestland allocation process should be improved to overcome past problems of inefficiency and inequity. This should include an appropriate solution between MARD and the MoNRE to merge the forest allocation and forestland allocation processes, providing single uniform guidance on participatory forestland use planning and allocation. Also, performance of the allocation process should not just be measured in terms of area allocated but, more important, in the quality of the process—measured in terms of equity and transparency—as experienced by recipients. This could be ascertained through surveys.

Environmental Sustainability Reforms

A multiple-use forest management approach is needed to ensure that a better balance is struck among the economic, social, and environmental services that forests should provide. Instead of strictly classifying forests as protection, production, or special use, the functional aspects of all three should be blended within site-specific forest management plans. These would gradually replace the current uniform management prescriptions and the quota system. Combining "production" with "protection" would increase the incentives and benefits for households and communities to actively engage in forest management and protection. Furthermore, the initial inventories and forest function mapping would provide baselines against which to monitor changes, thereby supporting sustainable forest management, PFES, and REDD

Box 4.8. Community-based mangrove management

Mangroves have been lost from much of the coastline of Thanh Hoa province (as elsewhere in Vietnam). In Hau Loc District, protection of remaining mangroves had been financed by Programme 661 using the Border Army for enforcement activities. Seeing the importance of mangroves in sustaining coastal residents' livelihoods and contributing to the reduction of disaster and climate change vulnerability, CARE facilitated the development of a community-based approach to mangrove management.

Local people have received training and guidance in hands-on activities in order to assume management responsibilities. They collectively run the nursery, selecting and sourcing seeds of recommended varieties for the area's varied local conditions, such as mudflats or sandy sea-beds; and they work together in preparing and planting the mangroves in groups of 50 to 700 people at one time. Thus far, nearly 250 hectares of mangroves have been re-established.

Mobilizing community-wide labor has been key to the high plantation survival rates. This has extended the existing mangrove area and increased the storm protection afforded to more than 6,000 people in the six project villages and to some 2,300 people from neighboring villages. In addition the community formed a protection team to report and stop activities that harm the mangroves and a youth-led Green Team with more than 160 members active in planting, beach cleanup, and raising awareness on the value of mangroves and environmental protection.

After nearly three years, the communities asked the Hau Loc District People's Committee for the full rights to plan, manage, protect, and sustainably use the mangroves. In October 2009, they were awarded these rights for five years, incorporating rules and regulations, which the villages had negotiated with local government under the framework of national legislation and regulations.
A study sponsored by CARE explored opportunities for replicating this co-management approach on a larger scale by other donors and in future for mainstreaming it by government, such as within the new national program on mangrove reforestation and rehabilitation.

Source: Nguyen Van Anh and Morten Fauerby Thomsen (CARE).

processes. The prerequisites for this approach will include:

- Improving the quality of forest inventory as a basis for forest management planning
- Identifying social, environmental, and economic forest functions and demarcation and mapping of production and protection zones
- Elaborating management plans that contain specific management prescriptions for the forest zones and their inherent forest functions
- Delegating provincial-level implementing authority, with capacity strengthened to support the process.

Closing natural forests to all harvesting is not an effective measure for sustainable forest management, and the existing quota system discounts the basis for sustainable forestry: harvesting based on growth and yield in a defined and permanent forest area. Under a system of multiple-use management of natural forests, the national harvesting quota system should be replaced with a scientific approach based on assessment of forest status and dynamics in order to determine sustainable yields. This will unlock the potential of natural forests to contribute more to local livelihoods and the wider economy, and it will increase the incentive for sustainable management.

Management of the protected area system needs a major institutional rethink, so that policy, planning, and regulatory decision making and management oversight are administered by a central organization, replacing the current multi-agency arrangement.

SUFs need to be adequately financed and effectively managed. This will require a definition of criteria for SUF funding that takes account of biodiversity value rather than just staff number and SUF size; an enabling environment, so that SUF management boards can generate income from biodiversity offsets, PFES, and leasing; capacity building for managers, technical, and field staff for more effective implementation of forest and biodiversity legislation; and integrated management approaches that provide for co-management in collaboration with local stakeholders, incentives to strengthen protection through benefit sharing arrangements, and buffer zone management arrangements that complement and reinforce protection activities.

Much of Vietnam's important biodiversity is found outside the boundaries of SUFs. To address this, there is an urgent need to improve integration of biodiversity conservation and environmental protection measures into management of production and protection forests. The multiple-use management approach would provide for this better, as biodiversity values would be identified at an early stage of planning and as zoning and management prescriptions would enhance protection efforts. This approach is also highly relevant in the changing climate, as critical sites would be protected and relevant environmental functions would be maintained (see Box 4.9).

Box 4.9. Climate change and forestry in Vietnam

A recent study of the forestry sector concludes that sea level rise, higher temperature, unpredictable rainfall and extreme climatic events will impact the boundaries of forests, the distribution of species and biodiversity. Very limited research is found to support quantitative conclusions, but the risk of forest fires, pest and diseases in forests are predicted to increase. However, some forest species can also benefit from higher levels of CO2 and reach higher standing volumes.

In order to mitigate these impacts it will be important to design biodiversity corridors that are resilient, enhance coastal mangrove barriers, improve seed breeding, and build capacity to fight forest fires.

Source: Adapted from Vu Than Phuong et al. 2010.

Provinces lack a clear provincial land use planning vision. Provincial Forest Protection and Development Plans should be prepared by consolidating site-level management plans. These will clarify management and protection needs as well as development potential for each province as a whole, based on individual site function mapping and zoning. Provincial administrations will be better able to plan for support to and development of the sector and to integrate these objectives within provincial socioeconomic development plans. Each plan will also provide a basis for defining a province's permanent forest estate and a means for identifying potentially adverse impacts from infrastructure and agriculture developments. This approach will require a greater commitment of planners and decision makers to ensure that the forest estate remains permanent; adequate resources and capacity building for planners, extension, and forest development staff at provincial, district, and commune levels; and a strengthening of legal safeguards to protect natural forests from avoidable damage.

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CHAPTER 5

MARINE RESOURCES

Almost half of Vietnam's provinces are located by the sea. In these coastal provinces, marine capture fisheries and coastal aquaculture account for a significant share of income and employment. Total annual catch in marine fisheries has increased almost fivefold in the past 30 years. Meanwhile the domestic market for fish and fish products is also expanding rapidly, with the people of Vietnam now obtaining about half of their dietary protein from seafood.

With this exceptional growth, a major price has been exacted, however. The marine resource base is deteriorating due to overexploitation and excessive fishing capacity, habitat loss, weak coastal planning, pollution, and other impacts. Major intersectoral deficiencies, jurisdictional overlaps, and policy gaps further compound these problems. A lack of efficiency is seen in the decreasing catch per unit effort due to overcapitalization in the fisheries sector or the loss of the services provided by coral reef and other marine habitats. Equity concerns arise from illegal fishing and poorly enforced regulation of fisheries. The documented declines in the abundance of marine species and in habitat extent and quality have serious consequences for the continued sustainable use of marine biodiversity and overall environmental quality in the marine realm. The poor system of data collection and lack of integrated coastal planning are overarching problems prevalent throughout the sector.

Marine resources pose a very basic "commons" problem, where various individuals all seek to exploit a shared resource that lacks some form of property rights, resulting in overexploitation with the costs borne by all users. Individual fishers, buoyed by government policies encouraging continued investment, have a strong incentive to increase their harvest. No individual has any incentive to exercise restraint, especially when regulatory and enforcement systems have little impact in controlling or managing the industry.

Ensuring sustainable, more-efficient, and more-equitable use of marine resources in Vietnam will require an innovative, integrated approach using a mixed strategy of regulation and market-based measures. A relative emphasis on non-state actors and private sector engagement is implied. Where government support and capacity development is warranted, these should generally be targeted at the provincial and/or district levels. For fisheries, a reform agenda should foremost develop and implement a program to steadily decrease the reliance of fishing households on a depleting resource. Intimately linked to this is the objective to institutionalize co-management and the use of rights-based measures in fisheries. Improving the standard of data collection and monitoring is also fundamental to such a strategy. Finally, more effectively applying marine spatial planning tools such as marine protected areas in managing marine resources for their sustainable use and conserving specific marine species and habitats of special concern is required.[205]

Many of Vietnam's more than 20 distinct ecosystem types[206] along the 3,200-kilometer coastline are regionally unique in their oceanographic properties. At the species and habitat level, Vietnam is a reservoir of diversity, home to over 11,000 known species. Offshore in the East Sea, northward undercurrents and southward countercurrents coalesce to form intense upwellings of nutrient-rich water, an engine of primary productivity. Together, these many varied marine species and habitat types in Vietnam not only form an impressive array of biodiversity, they also serve as a foundation for human economic development and livelihood attainment for millions of coastal peoples, as well as contributing significantly to national food security and the dietary protein intake of Vietnamese peoples.[207]

Fueled by rising demand and driven by the increased coastal population base, the marine fisheries industry has become the cornerstone of Vietnam's coastal development, accounting for nearly 6 percent of gross domestic product and with exports in 2009 valued at over $3 billion, making it the third leading exporter in the country.[208] Fisheries provide a direct or indirect source of livelihood to approximately 4 million people, and some studies estimate that up to 12 million people are partially dependent on marine fisheries. [209]

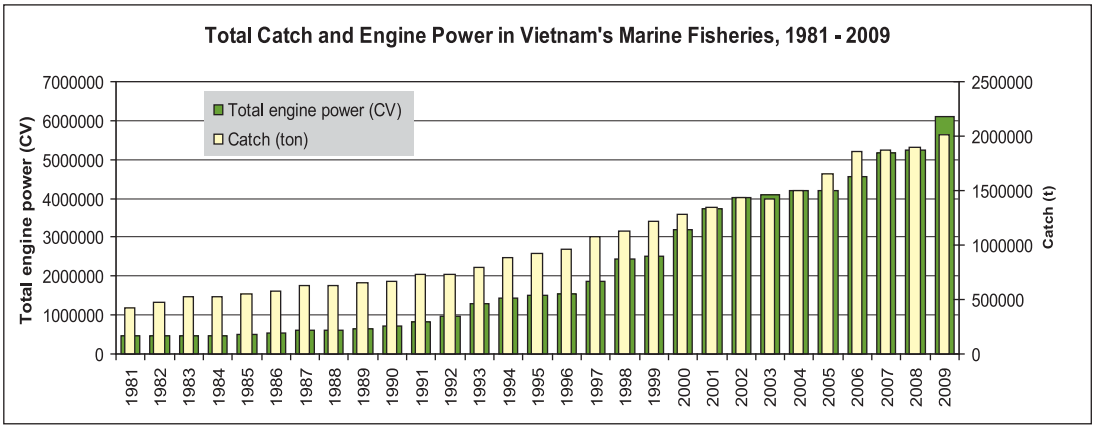
Approximately 130,000 powered fishing vessels are currently registered and operate within Vietnam's Exclusive Economic Zone (EEZ), with many more unpowered small unregistered craft in use for subsistence fishing.[210] These vessels concentrate in near-shore areas, with an estimated 85 percent of total harvest caught in an area of only 11 percent of the nation's EEZ. With a wide variety of engine sizes and hull lengths and with an array of (often interchangeable) gear employed, marine capture fisheries in Vietnam are not readily classified into "small scale" and "industrial" sectors; instead, they are more conventionally categorized as either inshore or offshore. [211]

In 2009 total annual capture fisheries production passed 2 million tons for the first time, an expansion greatly aided by government programs. (See Figure 5.1.)[212]

Fisheries management in Vietnam is under the Ministry of Agriculture and Rural Development (MARD). Under MARD, the Department of Capture Fisheries Exploitation and Protection (DECAFIREP) is responsible for fisheries resource management, vessel registration and licensing, monitoring, control, and surveillance. Major strategy and other documents for MARD include the Vietnam Fisheries Law (2003), the Five Year Master Plan for Fisheries Sector Development 2006–2010, and the Master Plan on Development of the Fisheries Sector till 2010 and Orientations Toward 2020 (MARD 2006).

Although the sector has received relatively little bilateral or multilateral agency support over the past decade, this has still played an important role, providing about one-third of public resources. The support provided by the government of Vietnam in terms of finance, human, and material assets is small compared with the sector's contribution to the gross domestic product. Investment and investment-related technical assistance have accounted for

Figure 5.1. Total catch and engine power in Vietnam's marine fisheries, 1981–2009



Source: MARD 2010.

the bulk of support, creating an imbalance between investment and maintenance/operation funding in the sector.[213] The main program assisting the sector at present is the DANIDA-funded Fisheries Sector Program Support (FSPS) Phase II and NORAD Fisheries Law Phase II.

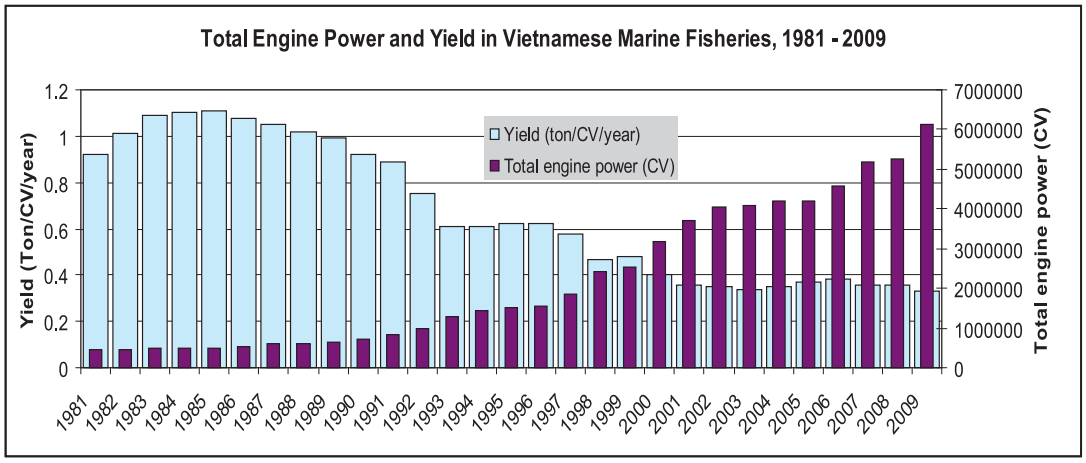
Major Issues for the Marine Sector

Marine resources are under tremendous pressure from the impacts of overfishing; overcapacity; illegal, unreported, and unregulated fishing (IUU); habitat loss and degradation; and other trends. Driven by Vietnam's strongly production-based policies combined with a general lack of past management planning within a largely unregulated open-access system,[214] and further exacerbated by the high level of vulnerability characteristic of coastal fishing communities, these issues pose great challenges in terms of achieving sustainable marine fisheries and sustainable livelihoods. Further complications arise from a coastal planning process designed to stimulate economic growth with conflicting land-sea uses, leading to increased risks of contamination and vulnerability to climate change.

Various studies indicate that almost all inshore areas are overexploited. Catch per unit effort has steadily declined. (See Figure 5.2.) Studies on catch composition have documented a decline in average fish size, as well as the "fishing down the food web" phenomenon, in which top predators are systematically overfished, resulting in a marine ecosystem dominated by mostly lower-value species.[215]

Given that poverty is still a major issue for coastal fishing communities,[216] Vietnam's inshore fishing community is in a precarious situation. For the offshore—where national policies continue to promote the development of fisheries to reduce pressure on the inshore resources—sustainable levels of production and capacity are still unknown. There is no mechanism to ensure that the phenomenon witnessed in past years—with large boats ending up fishing inshore instead—is not repeated.

Figure 5.2. Total engine power and yield in Vietnam's marine fisheries, 1981–2009



Source: MARD 2010.

The management of resources in the marine realm is extremely complex. This chapter aims to highlight a few of these issues as priorities, based on urgency, feasibility, or strategic opportunity for positive change. Other issues that are not given prominent treatment in this chapter are nevertheless important factors to be considered in a comprehensive strategy aimed at securing sustainable fisheries and livelihoods. Box 5.1 summarizes key factors contributing to the overexploitation and degradation of marine fisheries resources.

Box 5.1. Key issues and constraints for Vietnam's marine capture fisheries

- Overcapitalization and overcapacity in capture fisheries, aggravated by a lack of regulations preventing bigger offshore vessels from fishing inshore.
- Control over the fishery is severely constrained, both by the "open access" system and an overall lack of enforcement and monitoring of activities.
- Survey data are weak and insufficient to provide a foundation for sustainable fisheries or an ecosystem-based approach to management. Communication mechanisms between central and provincial levels related to data management and processing are ineffective.
- Communication mechanisms between central and provincial levels related to data management and processing are ineffective.
- Destructive fishing methods (dynamite, cyanide, etc.) continue to be used in coral reef habitats, decimating key rearing, nursery, and foraging habitats.
- Marine spatial planning tools, such as no-take marine reserves and fisheries refugia, are not widely implemented or comprehensively applied in fisheries management planning.
- The harvest of marine species of concern (such as sea turtles, sharks, and juvenile fish of commercial value) remains high, either as a directed catch or as "bycatch."
- "Trash fish" landings have increased, driven by an increasing demand from feed industries and leading to large-scale ecosystem impacts.
- Subsidy programs continue to encourage the use of fuel-inefficient and badly designed wooden fishing vessels. Past and current investments (and subsidies) aimed at offshore expansion have been mostly ineffective in meeting key targets and often exacerbate the overfishing problem.

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- The quality of fish landed is often poor (due largely to poor vessel design and lack of post-harvest onboard technology).
- There is a general prevalence in fisheries management of production volume as an indicator of success as well as an inconsistency between the strategic orientation of the national fisheries sector and (economic-based) harvest strategies at the provincial and district levels.

Source: Compiled from Pitcher 2006 and Pomeroy et al. 2009.

Fishing Overcapacity and Resource Inefficiency

The increased costs of fishing combined with declining yields suggest declining benefits from fisheries.[217] As a result, competition has intensified—between small-scale fisheries and large-scale fisheries and between fleets, national vessels, and foreign fishing vessels—further exacerbating the problem. In response to this challenge, Vietnam aims to reduce the number of fishing vessels in the country by 50 percent.[218] The overall policy is outlined in Vietnam's Master Plan on Development of Fisheries Sector till 2010 and Orientation toward 2020 (MARD 2006). A national Catch Documentation Scheme related to the exporting of marine capture fish products to the European Union (EU) has also been established. However, the efforts to manage fishing capacity are still in their early days.

Illegal, Unreported, and Unregulated Fishing

Studies suggest that IUU fishing by national as well as foreign vessels is widespread and increasing in Vietnam's EEZ. This is characterized by the increased use of prohibited gear or methods, the large number of unregistered vessels, lack of catch documentation, and generally poor capacity in fisheries administration.[219] The issue has also become a major policy imperative, given the growing level of international scrutiny related to IUU and current and emerging trade restrictions, as exemplified in the European Commission (EC) IUU fishing regulations introduced in 2010. [220]

A strategic response to the IUU issue must also recognize that capacity at MARD and provincial Departments of Agriculture and Rural Development Sub-departments to provide catch documentation or improve overall statistical management systems pertinent to IUU is extremely limited. As witnessed in January 2010, when the EC regulations came into effect,[221] this poor capacity translated into economic impacts as a result of a steep decline in orders from the EU for species such as tunas, swordfish, squid, and crabs.

Lack of Data and Formal Reference Points

The lack of detailed or verifiable stock assessment data and appropriate management reference points continues to confound fisheries management. Where data on fish landings are compiled, they tend to be by commercial group and not by species. This makes attempts to establish reliable biomass estimates (and therefore Total Allowable Catch estimates) a dubious approximation at best. DECAFIREP has a good fisheries management software package (VietFishBase). But the coastal province enumerators are unable to record and send the necessary data from all coastal provinces on a regular basis. Poor data capture also leads to an inability to manage fish stocks in contiguous provinces.

Figures for maximum sustainable yield (MSY)—currently estimated at about 1.7 million tons—are likewise unreliable.[222] Separate from the MSY, the economically optimal level of exploitation is the level of catch that provides the maximum net economic benefits or profits to society (MEY). Because costs rise with increasing effort, the MEY is necessarily lower than the MSY and would be a more appropriate indicator for more-effective planning and management in the fisheries sector.[223]

Vulnerability and Equity

Several studies have documented high levels of vulnerability in coastal communities.[224] For example, in the face of overexploited resources, local fishing households have to work harder to make the same income; they lack the capital or credit to invest in new gear or occupations; there is a high level of risk for fishing households in terms of income stability and outlook; and there remains generally poor access to markets or new

technologies for these communities, as well as a heavy reliance on intermediaries to sell fish.[225] Socioeconomic indicators are generally below national targets or averages—particularly average household income, poverty rates, and education levels.[226] There is also vulnerability to extreme weather events and the long-term impacts of climate change, which will bring rising sea levels and increasing saltwater intrusion. Extreme weather events damage boats, living quarters, coastal vegetation, and aquaculture facilities. Above all, they take lives.

Co-management in capture fisheries is in its early stages in Vietnam. There is a legal framework for peoples' participation in a range of management areas[227] at the commune level. This has led to significant (but still insufficient) financial support to a Capture Fisheries Co-management Task Force for the planning and implementation of pilot projects with a view toward nationwide dissemination. Legal reforms allowing fishing rights to be assigned under fisheries co-management scenarios have been slow to develop.

Supply Chain Inadequacies

The supply chain for seafood in Vietnam has not been effectively designed for sustainability. Problems include limitations in traceability, poor coordination, lack of clarity around the roles and responsibilities of different actors in improving management, and lack of branding or eco-certification. Buyers and processors have almost no direct links to producers, resulting in a major gap in supply chain management. Supply chain partnerships (such as contract systems) and fishery cooperatives—essential for better validation and more-sustainable exploitation of the resources—are largely lacking.

The major issues just outlined related to marine capture fisheries have clear consequences for the maintenance of marine biodiversity—indeed, fisheries are the major driver of negative environmental impacts in the marine realm. The loss of critical spawning, rearing, and foraging habitats from destructive fishing methods such as particular types of bottom trawling, dynamite and cyanide fishing, and illegally sized net meshes is directly evident. Drivers such as coastal development, pollution, and coastal aquaculture have also taken a heavy toll on marine biodiversity. The general absence of comprehensive and integrated coastal development planning and weak management of economic activities in coastal areas have consistently limited efforts aimed at the conservation and sustainable use of a coastline that supports a rising population.[228] Coastal development has led to widespread destruction of adjacent coral reefs, sea grasses, and mangroves through sediment loading and pollution. Coastal tourism has been largely unregulated, with impacts not only from construction but also from the growing level of marine tourism activities along the coast.[229]

Marine environmental quality has also been negatively affected by poor natural resource management upland, such as deforestation that leads to increased runoff, soil erosion, and sediment loading in rivers, streams, estuaries, and ultimately the ocean. The ramifications of such impacts are widespread. For example, the development of harmful algal blooms has had major implications for overall food safety, export marketing, and profitability in the seafood sector.

Indicators that marine biodiversity is in decline are widespread. Twenty-five percent of Vietnam's coral reefs are classified as being "at very high risk" from degradation and habitat loss—the highest rate of more than 10 countries surveyed in Southeast Asia.[230] Sea grass beds are similarly declining, threatening the livelihoods of the communities who depend upon them. Mangrove forests, central to the biodiversity of marine and estuarine ecosystems as a natural nursery for a wide range of finfish and shellfish, continue to decline, from 400,000 ha in 1943 to 59,760 ha in 2008, with primary mangrove forests having virtually vanished.[231] The number of

productive sea turtle nesting beaches in Vietnam has declined significantly. Dugongs—a herbivorous marine mammal that is listed as "vulnerable" on the International Union for Conservation of Nature's Red List—have virtually disappeared from Vietnam.

The Way Forward

Improving Data Collection and Resource Assessment

Effective data collection, analysis, and resource assessment is a cornerstone of fisheries management. New capacity is urgently needed at provincial and district levels for data collection, monitoring, information sharing, administration, and enforcement to support of a variety of key policies and measures (such as capacity reduction, co-management, IUU, offshore fisheries management, and so on). Specific areas of effective intervention could include the following:

- Expanding the application of VietFishBase software on a provincial basis, linked together through a network; the comprehensive application and inter-networking of VietFishBase would help determine which provinces are being effective in data capture and analysis and help resolve the confounding problems of institutional non-linkages and lack of chain of command in fisheries monitoring, control, and enforcement to aid decision making
- Concerted efforts to adequately train provincial fisheries staff (and provide additional required resources) in enumeration, onboard observer programs, and dockside monitoring and the use of software applications
- Further development and expansion of onboard Observer Programs aimed at collecting data on catch rates and impacts on sensitive species as well as providing opportunities for detailed biological sampling
- Ascension by Vietnam into the Western and Central Pacific Fisheries Commission as a full member nation.

Reducing Capacity for Environmental Sustainability and Greater Efficiency

The government of Vietnam, with support from the Food and Agriculture Organization, has drafted a National Plan of Action (NPOA) on fishing capacity reduction that identifies management priorities for various interventions. While the NPOA provides an important foundation for addressing overcapacity, it will be essential to select the most appropriate interventions, based on an understanding of the social ecology of fishing communities, and with an emphasis on the active participation of fishing communities as well as a focus on household (as opposed to individual fishers). Approaches need to go beyond "alternative income generation" projects that assume (inappropriately) that fishers are willing and able to leave fishing;[232] they need to focus on improving the enabling economic environment together with job diversification and vocational training opportunities. This will allow fishing households to reduce their dependence on a depleting resource.[233] The critical contribution that co-management may provide in achieving capacity reduction goals should also be recognized, and such approaches should be integrated into the Plan of Action. Thus a strategic agenda for addressing capacity reduction could include the following:

- Increased financial and human resources at provincial and district levels to improve data collection and local administration aimed at implementing the NPOA
- New governance arrangements at local levels that use a form of rights-based measures, such as limited entry and/or territorial use rights).
- Stronger programmatic linkages between coastal fishing communities and national poverty alleviation and/or job diversification programs

- Related to above, detailed livelihood and job diversification strategies at the district level focused on improving the broader enabling economic environment as a means to reduce the dependence of households on fishing
- Development of job diversification strategies that link into mariculture development, particularly those industries that are labor-intensive yet comparatively less harmful to the environment (see Box 5.2)
- Improved interministerial and interjurisdictional linkages to ensure cooperation and coordination for these initiatives.

Expanding and Institutionalizing Fisheries Co-management

National policies endorsing co-management as a strategy for managing fisheries have existed for over a decade. However, co-management has yet to become institutionalized in Vietnamese fisheries, despite several documented successful examples of fisheries co-management. (See Box 5.3.)

Co-management frameworks should recognize that a legal framework on fishing access rights granted to local fisheries associations would support better governance of the sector and address various management constraints, including lack of compliance with regulations and the lack of bargaining power for coastal fishers. It is recommended that the co-management framework initiated under FSPS be continued and scaled up through further pilots and a concerted effort to institutionalize the framework within MARD as standard practice nationally. The expansion of co-management initiatives should be initially concentrated on a few selected areas where opportunities for synergies and success are highest. A recommended course of action would include the following:

- Continued support for the Capture Fisheries Co-management Task Force (established under FSPS II) and the Co-management Network under MARD to monitor and evaluate progress and facilitate future planning and implementation of further pilots
- Provincial and district-level support for the

Box 5.2. Low on the food chain but high on the value chain?

The option of industrial scale nearshore mariculture using "low-on-the-food-chain" species—such as seaweeds, holothurians, bivalve (mussels and oysters), and gastropod (abalone) mollusks—offers a potentially innovative and effective tool for linking capacity reduction with job diversification. As they are labor-intensive, these floating systems, inherently less detrimental to the environment,[234] would take advantage of high productivity and could provide employment for fishers displaced from capture fisheries.

Employment would involve transporting inputs and final produce to and from local ports, transporting personnel, guarding, laying moorings, maintaining systems, cleaning production units, and harvesting. These floating systems would act as de facto Marine Protected Areas, as guards would ban fishing, especially the illegal dynamiting and use of cyanide and chlorine plus electricity. Anecdotal evidence, combined with fisheries co-management sanctuary studies, suggests that biodiversity and abundance both increase in these systems, thereby improving artisanal fisheries in the surrounding areas. Prior to encouraging investment, however, market surveys need to be carried out to assess the impact of several thousands of tons of product on long established markets. These surveys should also look at the cost-benefit of adding value by sun-drying, smoking, extracting chemicals like agar and carrageen, and so on.

establishment of more fishing organizations and to facilitate new co-management pilots in priority areas displaying a strong potential for success (suggested priority areas include Binh Dinh, Quanh Nam, and Nghe An)

- Support at the national level (in MARD) for improving the legal framework for co-management and application of rights-based measures, as well as elaboration of implementation guidelines to be used across all coastal provinces

Box 5.3. Successful examples of fisheries co-management in Vietnam

The fisheries co-management model developed at Tam Giang Lagoon in Thua Thien-Hue province[235] is widely regarded as one of the most advanced in Vietnam.[236] Initiated in 2005, the model provides for a variety of fishing access rights and mechanisms for shared decision making and co-management (including the establishment of local fishing associations). Legally, Decision no. 4260/2005/QD-UBND promulgated by the People's Committee of Thua Thien Hue enables the issuance of fishing rights and has been described as "very innovative both for Vietnam and Southeast Asia as it provides for a whole new management structure for coastal resources in the country and a model for other areas in the country.[237]" The numbers of fishing households, fishing effort, species, and catch sizes are largely decided by fishers. The model in particular provides an innovative approach for using zoning and allocating fisheries rights to user groups.

The Management of Natural Resources in the Coastal Zone project[238] in Ao Tho B, Soc Trang Province, has enjoyed demonstrable success in piloting the establishment of mangrove co-management and in testing the national fisheries co-management framework. Initiated in 2007 with the Forest Protection Sub-department of the province, the pilot aimed at developing solutions through participatory methods to solve various conflicts between economic development and sustainable coastal zone management. Specifically, a co-management system was developed that not only enabled the participatory planning of mangrove forests (into protection, rehabilitation, and sustainable use zones) but also controlled access, allowing only members of the local co-management group to catch fish. Fishing techniques and gear are also strictly regulated, and a simple yet effective monitoring program has been established. Preliminary findings indicate that the project has been successful in protecting local habitats and livelihoods, in reducing the workload of authorities, and in the equitable sharing of benefits. [239]

Established in 1997, the Rang Dong Fisheries Cooperative has evolved into an excellent example of how rights-based fisheries management can provide incentives for resource users to protect their local resources and gain long-term, sustainable economic benefits. The cooperative was formed at the provincial level to manage the natural fishery resources in 900 hectares for both raising breeding clams and growing them out in intertidal areas for harvesting. Access to the clam fishery is restricted to its members, and the mud flats are policed by uniformed staff. Approximately 40 percent of the mud flats are left unexploited, in order to ensure sustainable brood stock, environmental conservation, and product quality. The clam fishery—increasingly destined for export to niche markets in Europe—has been economically successful.[240] In 2009 this clam fishery was the first in Southeast Asia to receive full environmental certification under the Marine Stewardship Council (MSC). Buoyed by the success of the Rang Dong example, 10 additional clam cooperatives have been established in recent years. The strong management system in place to protect the clam beds and control their harvest was essential for achieving this certification.[241]

- Parallel activities at selected marine protected area (MPA) sites aimed at establishing rights-based measures for local fishing communities (suggested priority sites include Con Dao and Nui Chua).

Market-based Access and Eco-certification Strategies

The growing interest in key export markets for more sustainably harvested seafood (especially among retailers, buyers, and exporters) provides opportunities for incentives for improved management across the supply chain and for shifting generally toward value-added and sustainability-based (as opposed to production-based) models. Strategies for enhancing sustainability, adding value, and improving efficiency through market access could include:

- Establishing public-private partnerships (PPPs) aimed at building capacity in PPP as a viable means of financing and maintaining projects aimed at managing and sustaining capture fisheries resources
- Implementing fisheries improvement projects incorporating a step-wise approach of "continual improvement" and using positive incentives (including improved access to markets, extension programs for environmentally friendly gear and techniques, and the establishment of direct sourcing arrangements) across the supply line
- Improving traceability systems nationwide, with an emphasis on traceability for environmental sustainability and regulatory compliance; activities could include dissemination of guidelines, communications, and training programs across the supply chain, using and promoting good examples (such as Ben Tre clams)
- Continuing to support training and extension services in post-harvest techniques aimed at linking improved management measures (such as adoption of fisheries best practices, use of more environmentally friendly fishing gear) with optimizing value; shifts from the current model of quantity-based targets toward more value-based approaches can also help generate employment and thus link to capacity reduction strategies; cost-benefit analyses would be required to ensure that market demands can be met and that risks during the value addition can be mitigated
- Expanding the eco-certification agenda in Vietnam, including exploring new opportunities for MSC certification.

Reforming Fisheries Subsidies

The government has extended significant subsidies to fisheries.[243] These can be justified if they provide public benefits that the market would otherwise undersupply. But subsidies are also a financial drain on the public coffers and can further distort markets. In practice, some of the fisheries subsides have gone to traditional "public good" investments of fisheries information systems and storm shelters. But there have also been tax breaks, as well as fuel subsidies of some $90 million in 2008—the latest year for which data are available.

Despite the best intentions of subsidies aimed at expanding offshore fishing or at re-establishing profitability in the short term (for example, fuel subsidies), the overall impact of these programs on long-term efficiency, equity, and sustainability in the sector can be expected to be negative.[244] Subsidies such for vessel upgrades, credit, and other assistance aimed at expanding offshore fisheries will likely spill over into more fishing inshore unless protection of those areas can be improved, further damaging already depleted fish stocks. This circle of events can push poor fishing households further into poverty as the resource they depend upon is further depleted. The sustainability of further offshore fisheries expansion is also questionable.

Therefore it is recommended that fisheries

subsidies policy in Vietnam be reconsidered. A recent report co-authored by the Vietnam Institute of Fisheries Economics and Planning makes several progressive recommendations for reprioritization of fisheries subsidies programs. (See Box 5.4.)

Sustainable Use of Marine Biodiversity

In general, the legislative framework in Vietnam provides a basis for the conservation and sustainable use of marine biodiversity. But the effective implementation of legislation is frequently constrained by unclear and overlapping institutional jurisdictions, weak interagency cooperation, and capacity limitations. Moreover, the approach to conservation interventions in Vietnam has tended to be opportunistic and independent rather that strategic and coordinated. However, a number of opportunities for the improved management of marine biodiversity can be identified, including the wider and more effective application of MPAs along with marine species protection and conservation programs aimed at reducing impacts on species of special concern (and their habitats) and reversing the decline of key populations.

Marine Protected Areas

MPAs, while not a cure-all, can provide very useful tools for addressing sustainability issues locally and for testing approaches for sustainable coastal development, including the application of spatial planning for fisheries enhancement, site-specific protection of habitats, establishment of local co-management schemes, development of eco-tourism, and the integration with coastal development planning. Vietnam is embarking on an ambitious national marine protected area plan[245] with a shortlist of 16 MPAs already approved by the Prime Minister, most recently under Decision 742/QD-TTg to adopt national MPA system planning to. To date four MPAs—Nha Trang Bay, Cu Lao Cham, Phu Quoc, and Con Co—have been officially designated, together with two National Parks with marine components (Con Dao and Nui Chua).

The new capacity developed through the Livelihoods and Marine Protected Areas Program

Box 5.4. Key recommendations for the reprioritization of fisheries subsidies

- Reform of fisheries information management, including licensing and statistical management systems.
- Strengthening the monitoring, control and surveillance of fisheries activities.
- Promotion of community-based fisheries co- management as a means to reduce fishing efforts and promote more responsible fisheries while reducing interventions and expenses of government.
- Support for ecosystem-based fisheries management including establishment of MPAs.
- Providing scientific research to support more efficient and sustainable fishing.
- Implementing environmentally friendly technologies (e.g. by-catch reducing gear) and other programs (such as Observer Programs) aimed at promoting fisheries Best Practices

Source: VIFEP and WWF 2009.

opens new avenues to expand the MPA network in Vietnam and improve management effectiveness. Investments in MPAs since the early 2000s have led to important insights into their application for biological conservation and sustainable livelihoods. These lessons are critical, as past reviews of MPA management effectiveness at preliminary pilot sites have documented a variety of key shortcomings. (See Box 5.5.)

A suggested strategic way forward for MPAs in Vietnam includes the following:

- Developing operational management plans for selected new MPAs; suggested priority sites include Cu Lao Cao and Phu Quy islands, where feasibility has been established; other new MPA processes should first undergo feasibility studies based on clear biological, socioeconomic, and governance objectives[246]
- Supporting small-scale MPAs at local levels, specifically Trao Reef Locally Protected Area (Khanh Hoa) and Tam Hai Locally Protected Area (Quang Nam); while not formally part of the currently proposed MPA network from MARD, these sites have a high potential to deliver biological, socioeconomic, and governance results, and their importance has been re-affirmed by their mention in the recent Decision on MPA systems planning
- Link national job diversification strategies to livelihood programs aimed at reducing dependence on fishing for communities in and around MPAs
- Investing in training (for MPA site and network staff and other relevant provincial and national government staff) in planning and management, building upon progress and lessons to date and using management effectiveness guidelines already developed and introduced;[247] such training should be expanded to include local stakeholders and include programs for certification in MPA management
- Systematically applying "reef resilience" [248] management and design criteria at existing and future MPAs, aimed at mitigating anticipated impacts from coral bleaching (a whitening of corals) arising from prolonged rises in sea temperature
- Integrating the fisheries co-management model and legal framework for rights-based measures being developed by MARD

Box 5.5. Lessons learned for MPA planning and management to support sustainable use of marine biodiversity in Vietnam

- For MPAs to be effective they should include significant coverage of "no take" areas as well as other highly protected areas with a designation based on biological management criteria.
- MPA operational management needs to be strategically applied to protecting spawning populations and enhancing recruitment of commercial fish species locally and regionally. This also implies the long-term monitoring of fishery indicators and assessment of fisheries benefits at the MPA sites.
- Delivery of the benefits of MPA establishment (particularly fisheries-related benefits but also other economic benefits, such as eco-tourism) to local communities is paramount for success. This implies greater involvement of local fishers in the planning and management of MPAs, the application of co-management approaches, and the use of exclusive fishing rights for local communities as part of the MPA design.

- Livelihood projects aligned with MPAs should focus on job diversification. Individual "alternative income generation" projects tend to have limited effectiveness or conservation impact. It is critical to ensure that target groups are adequately identified.
- Mechanisms for better intergovernmental coordination and cooperation at MPAs would help ensure strategic alignment with coastal development and tourism planning.

Source: McEwin et al. 2008.

with MPA management (suggested priority sites are Con Dao and Nui Chua MPAs).

Species Conservation

The protection and conservation of marine species of special concern remains an urgent issue in Vietnam. While past investments from the donor community in programs aimed at protecting and conserving endangered species such as sea turtles and dugongs have been significant, they have proved insufficient in reversing population declines. More recently, the declining status of various shark species in the region has become a growing concern and may have far-reaching consequences both economically (as an important seafood commodity) and environmentally (as a top predatory that helps maintain functional and balanced marine ecosystems).

Suggested priorities would include the following:

- Scaling up sea turtle beach protection at priority sites (Con Dao, Nui Chua, and Phu Quy) and implementing comprehensive training in nesting beach management at these and other key areas based on application of the (successful) model at Con Dao
- Expanding experimental trials of circle hooks[249] in longline tuna fisheries as a means to gain support for their use and with a view to securing political commitment and regulatory measures aimed at mainstreaming the use of circle hooks (as well as turtle de-hookers and turtle rescue techniques)
- Linked with above, expanding the current longline fisheries Observer Program[250] to a level where at least 10 percent of all longline vessels have trained onboard observers using standard protocols for species identification and for monitoring and recording catch rates of sea turtles, sharks, and juvenile tuna
- Introducing national, provincial, and district educational campaigns aimed at raising awareness and changing attitudes of the Vietnamese population, especially younger generations, regarding marine wildlife trade, particularly the illegal trade in sea turtles.

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CHAPTER 6

MINERAL RESOURCES

The mining of solid minerals in Vietnam has grown rapidly in the past five years, driven principally by the exploitation of coal. Excellent geological potential exists for development of other mineral deposits, such as bauxite, nonferrous metals, and industrial and construction minerals. Compared with many other countries, Vietnam has made significant progress in managing the development of its mineral resources. In spite of the expansion of the sector, however, Vietnam is not yet achieving the true value of the contribution that its mineral endowment could make to economic development.

This chapter identifies the opportunities for improvements of Vietnam's management of its resources in terms of three main themes: efficiencies in providing access to mineral resources and effective sector administration and environmental sustainability, management of environmental and social impacts, and equitable distribution of benefit streams.

The chapter proposes a "reform agenda" that addresses these opportunities. This includes enhancing efficiency in the minerals sector by planning for minerals development using the "resource assessment" model, reinforcing security of the legal regime and granting of mine titles, encouraging exploration for new mineral deposits by the private sector, strengthening the institutional reforms in the mining sector, and giving due attention to the strengths and weaknesses of State Owned Enterprises. In terms of environmental sustainability, it will be important to close the gap between theory and practice in the Environmental Impact and Strategic Environmental Assessment processes and to tighten regulations and administration of environmental fees and financial sureties. With respect to the equity theme, the main reform proposals are to establish community development agreements, measure the economic contribution of mining on a nationwide and project basis, and adopt the principles and implement the Extractive Industries Transparency Initiative.

Development of mineral resources can and does contribute to the wealth of nations and to overall goals of economic development and poverty reduction. Achieving positive results is not easy, however, and governments, private sector companies, and civil society face numerous challenges to ensure sustainable development. Some governments fail miserably in overcoming the challenges and fall victim to the "resource curse."[251] Other governments use their natural mineral wealth to much better effect and are achieving sustained growth with equity in the sector. This chapter argues that the Socialist Republic of Vietnam is in between these two extremes: some of the mineral wealth of the country is being developed and is contributing to economic development, but Vietnam could do much better in terms of achieving efficient access to the resources, improving environmental oversight, and distributing the benefit streams from minerals development in an equitable manner.

The Mining and Quarry Industrial (MQI) sector in Vietnam includes petroleum, construction materials, coal, industrial minerals, mineral water, and some base metals.[252] The sector has grown rapidly, contributing 11 percent of gross domestic (GDP) in 2005, up from 5 percent in 1995[253]. (Oil and gas are not considered in this chapter since this industry operates mainly offshore, and the environmental ramifications of these operations are entirely different from solid minerals.) Excluding oil and gas, the size of the solid minerals segment of the MQI sector relative to the overall economy in Vietnam would put the country on a par with Ghana, which derives 6 percent of GDP from gold mining along with 45 percent of its export earnings and 12 percent of the government's tax receipts[254].

This chapter does not attempt to cover all the current issues in this sector;[255] rather, it focuses on the main themes of this report: efficiency, environmental sustainability, and equity. The

Annex provides a case study on how these three themes interplay in the development of coal.

Vietnam is reasonably well endowed with some 60 mineral commodities and produces many of them, such as coal, bauxite, gold, copper, zinc, tin, copper, chromite, manganese, titanium, barite, ilmenite, limestone, and phosphate. By far the most important mineral commodity produced is coal: in 2009, some 44 million tons of coal were produced, of which 50 percent was exported.[256] Some minerals, such as chromite, ilmenite, barite, and zinc concentrates are exported; however, most of the mineral commodities are processed and consumed locally, including limestone (for cement), refined copper, fertilizer materials (ammonia, urea, and phosphate), rolled steel, refined tin, and zinc.

In spite of the growth of this sector and the country's excellent minerals endowment, MQI solid minerals are heavily dominated by coal, and not enough exploration is being conducted to develop new deposits and diversify the production base. For instance, metallic ores and other minerals are not growing as fast, and expansion of these commodities is a major challenge for the future. There are a number of reasons for this, including lack of new investment; the modest size of investments, which may lack economies of scale; shortages of required infrastructure, especially power and transport; antiquated mining equipment and techniques; and poor efficiencies and mineral loss in extraction due to outdated mining technologies. In addition to not producing optimum benefits, the sector could, in some instances, actually cause harm to economic development. This occurs because of short- and long-term environmental damage as well as aggravating social tensions related to development of extractive industries projects and distribution of benefit streams.

Two issues are particularly vexing. First, more can and should be done to mobilize private sector investment to explore and discover mineral resources. Vietnam's geological features are similar to those of Lao PDR and the southern part of Yunnan province in China. In each of these locations significant investment in exploration over the last 5–10 years has resulted in the discovery and development of several world-class copper, gold, nickel, and tin mines.

In Vietnam, however, expenditures on exploration seem to be going in the opposite direction. From a peak of $63 million spent on exploration in 2008, total exploration in 2009 was only $4 million.[257] Second, Vietnam could achieve higher value added from its minerals production by encouraging beneficiation and processing of raw minerals[258]. Even though enhanced processing is mandated in the Minerals Law and by the Politburo policies, in reality many mines in Vietnam still export raw ores.[259] Achieving greater value added through beneficiation and additional processing is not easily done, however. Small-scale mining companies lack the capital and technology to beneficiate their ores, and they are in any event more interested in selling raw ores quickly for profit. And a nickel smelting facility, for example, could cost $120 million or more. International market conditions need to be taken into consideration, as the marginal cost of additional processing may not be compensated by greater access to markets at higher value. Governments have had mixed success devising incentives for enhanced beneficiation. In general, fiscal and other investment incentives for producers to beneficiate have had limited success in achieving higher value added, and these incentives also could involve substantial costs to the state treasury.

Efficiencies in Providing Access to Resources

Commodity "Master Plans"

Development of the MQI is guided through "master plans." These are drafted by the government to cover 10–15 years and they drive the exploration, exploitation, and processing of

different minerals. The plans generally focus on mineral deposits that are considered "essential reserves" that may be developed and exploited on a large industrial scale. Approval for development and monitoring of exploitation of these large mineral deposits in the master plan is the responsibility of the central authorities, principally the Ministry of Natural Resources and Environment (MoNRE). Smaller deposits, not specifically identified in the master plan, are controlled by the provincial authorities. There are currently 13 approved master plans for 39 minerals, among them gold, copper, nickel, iron, chromium, manganese, lead, zinc, bauxite, and titanium, with visions generally extending to 2020 and 2025. The main content includes the development targets, demand forecasters, exploration plans, mining and processing planning, and investment capital required. (See the list of master plans in the References.)

Master plans used in Vietnam are *"dirigiste"* in nature and tend to simply list projects and production targets. They are contrary to the current development paradigm of encouraging private sector investment and competition. And they can actually stifle new ideas and innovative proposals. For example, if an exploration program proposed by a private company for a commodity or in an area is not noted in the master plan, the proposal would be difficult for the government agencies to accept. The master plans are only issued every several years and the experience in the solid minerals sector is that the plans are updated on an ad hoc basis rather than regular basis. Experience in the solid minerals sector is that the plans cannot be amended easily or within a reasonable amount of time. Thus, some companies having viable projects not noted in the master plan have had to wait at least two years for the plan to be updated or have exercised other options, such as directly intervening with the highest political authorities, to have the projects authorized.

Other significant drawbacks are that the plans are prepared by government agencies (Ministry of Industry and Trade, MoNRE, and/or the state-owned company (Vinacomin) in Hanoi) and may not sufficiently reflect the realities of the market or local conditions. The master plans take the analytical approach of "what we have" rather than the more rigorous market analysis approach of "what the consumer needs." In practice, public comment and consultation with local communities and companies during the preparation of the master plans is a mere formality and does not normally result in meaningful changes being integrated into the master plans as a result of these consultations. Finally, while the newest regulations for master plans require a Strategic Environmental Assessment (SEA), the master plans that have been approved to date and prior to the July 2006 do not deal with highly salient topics, such as involuntary resettlement, possible contamination and environmental pollution, in-migration, local multiplier effects, alternative land use patterns, effects on household incomes, and induced health effects.

The first item on the reform agenda for the mining sector is to plan for minerals development using the "resource assessment" model. The use of master plans to program the industrial development of specific mineral deposits is highly unusual in terms of international practice and reflects an attachment to the past heritage of central planning. There is nothing inherently wrong about planning for sector development; indeed, "resource assessments" can be highly useful to assist in land use planning, plan for infrastructure investments, and develop integrated growth poles or resource corridors. A proper resource assessment also considers all the benefits directly from the project or induced as well as all of the costs, including long-term environmental costs and alternative land uses, recording of benefit streams, and special topics such as gender and climate change issues (for example, the emission of methane, which is a powerful greenhouse gas) associated with sector development.

Granting of Mine Titles and Concessions

Foreign or domestic companies wishing to invest in large-scale exploration, development, and exploitation operations in Vietnam follow a two-track process to obtain the mine title under the Mineral Law and to set up an entity by obtaining Investment Certificate for each specific project under the Investment Law.

The basic legislative instrument that governs minerals exploration, extraction, and processing is the Law on Minerals of 1996 (amended by the Mineral Law of 2005), as supplemented by various Decrees and Circulars of the government agencies responsible for mining.[260] This Law derives from fundamental Politburo policy directive 13-NQ/TW (1996). The government is in the process of amending the Minerals Law and is conducting extensive discussions with various stakeholders on the subject.

In addition to the Minerals Law, the Investment[261] Law applies to investments in the mining sector. In particular, this law seeks to attract foreign direct investment in order to mobilize sufficient capital for this capital-intensive sector, to attract advanced technology to exploit minerals efficiently, and to promote the transfer of foreign advanced technology with spillover impact on the human capital base.[262] Several other legal obligations and authorizations of the appropriate authorities apply to investments: rights to land use, forestry clearance procedures, construction permits, work permits (for expatriate employees), exchange control, accounting practices, water use, loan agreement registration, environmental rehabilitation program, permit for using hazardous materials and equipment, and others.

The procedures to register the investment, obtain mining titles, and receive the various authorizations are tedious and time-consuming, and it can give rise to the possibility of inappropriate practices and favoritism by authorities. If the proposed mineral deposit is not noted in the "master plan" for the commodity, then special dispensation and permission must be obtained.[263] In many cases, the master plan does not have complete or independently corroborated exploration estimates on the reserves of the deposit, which means the government must rely on reserve estimates from the company, and these can be understated so that the company can illegally export greater quantities of ores without paying the relevant royalties and taxes.

A relatively new issue in Vietnam since 2005 is that the measures to decentralize government decision making has led to the rapid proliferation of small-scale mining licenses granted by provincial authorities. This has led to a chaotic situation and lack of proper oversight of operations in some provinces. For example, over 3,495 licenses were granted by provincial and/or municipal authorities from 2005 to 2008 compared with a total of 926 licenses granted by the central ministry in the previous 12 years.[264] While decentralization of the authority could present the advantage of bringing the administrative burden closer to the potential investor, it has proved in practice difficult to implement due to the lack of administrative capacity and review procedures of the provincial authorities.

An issue frequently considered by governments is whether or not to provide for the auctioning of mineral properties. On the one hand, an open and competitive tender, transparently and professionally conducted, of mineral properties in theory would result in the government achieving the best market value. On the other hand, experience in many countries shows that successful tender of mineral properties is mixed. The fundamental determinant is that the government should possess and provide for potential bidders sufficient geological data to establish proven and probable reserves. Without this information, bidders would not have enough data to establish a fair market price for a deposit or provide a viable development plan. The latest amendments to the Minerals Law in Vietnam

provide for tenders to be conducted for mineral deposits. The dispositions in the law will need to be completed with detailed regulations and procedures in order to successfully conduct tenders.

It is important, therefore, to reinforce security of the legal regime and the granting of mine titles. The processes of mineral title acquisition, registration under the foreign investment regime, and compliance with other legislative instruments corresponds to the practices in many countries and provides the foundation upon which the state allocates mineral resources to third parties and ensures that investments correspond to contractual and legal obligations.[265] In finalizing the reforms to the Minerals Law, the government, in consultation with private companies and other parties, should work to strengthen security of tenure, provide realistic time frames for development of resources, establish objective criteria for evaluation of mine title applications, establish clear mandates for intervention of government departments, provide for judicious use of tender and auction mechanisms that reflect the realities of the international market, and ensure that the tax regime pertaining to minerals development is competitive and fair.

IIt is also important to encourage exploration for new mineral deposits by the private sector. At present, only the geological survey unit within MoNRE conducts basic research and exploration for minerals resources. Vietnam could do a better job to mobilize investment from private sector companies in this regard. (But see Box 6.1.) This will require a clear legal mandate and security of tenure within the mining law that adheres to internationally accepted principles of "first come, first served" in the issuance of exploration licenses as well as automatic progression to an exploitation license for the company in the event of a discovery. Also, regulations will have to be modified to allow foreign companies to invest in "grass roots" or preliminary exploration without the requirement to identify a specific project or investment. Additionally, regulations will need to be adopted to put into operation the dispositions in the amended Minerals Law pertaining to tender operations. Exploration by its nature is expensive and risky; the state has every interest in maximizing private capital and risk taking in

Box 6.1. Contributions of a mining project: The case of Ban Phuc Nickel

The Ban Phuc nickel project is the only foreign investment enterprise currently licensed in Son La Province. During the first phase of the construction period, the company employed 298 people, 184 of whom were local workers from within Son La. The creation of jobs is a significant contribution to the socioeconomic development of the Bac Yen district, a mountainous and difficult area. During construction, BPNM has been paying an average of $1.9 million per month to Vietnamese contractors/suppliers. Of this, Son La based contractors or suppliers receive approximately 20 percent or $350,000 per month. In addition to the 298 company employees, BPNM has provided income for 240 Vietnamese contractors or suppliers, 10 of whom are based in Son La province.

The construction of Ban Phuc Project has created new opportunities for local and national Vietnamese employees to achieve good income and improve their living standards. On average, employees at Ban Phuc Mine earn $210 a month. This is a significantly income for local people around the mine, where a year ago they could earn only $60 a year from small-scale farming and supporting activities.

In addition to salary, BPNM also provides its employees with Social Insurance and Health Insurance coverage, safety equipment and instruments, and safety training for local workers. Finally, approx VND 3 Billion per month are paid to Son La in taxes.

Source: Ban Phuc Nickel Mines 2009.

return for access to the data and information on potential geological resources.

Effective Sector Administration and Environmental Sustainability

Effective management of the mining sector is a function of clear and non-over-lapping mandates between the various institutions intervening in the sector at the central and provincial levels. In Vietnam, MoNRE[266] is the principal central government agency responsible for geological survey work, mine title administration and maintenance, and review of environmental assessments. In addition to MoNRE, the Ministry of Industry and Trade (MOIT) plays a key role in the development of master plans for various commodities as well as approving the usage and export of minerals in collaboration with other state-owned mining companies and agencies. The Ministry of Planning and Investment is responsible for investment certificate registration and investment capital of companies. In the provinces, local government assisted by district agencies modeled on the central government counterparts also intervene in the mining sector, particularly in the authorization and issuance of permits for quarry and small-scale mining operations.

In the case of Vietnam, there is a continued strong role in the mining sector (as well as other heavy industries) of state-owned enterprises (SOEs). Prior to 2005, the principal mining enterprises were the Vietnam National Minerals Corporation (VIMICO) and Vietnam National Coal Corporation (VINACOAL).[267] In that year, however, a state holding company was established: Vietnam National Coal-Minerals Industries Corporation (Vinacomin), which now directly owns and operates coal and metals mines in Vietnam and/or retains on behalf of the state shares in joint ventures with private mining companies. Vinacomin directly or indirectly controls approximately 95 percent of the country's hard-rock minerals production. The members of Vinacomin's management board are state employees, and the Chairman and General Director are appointed by the government. Vinacomin enjoys preferential treatments by the government: for instance, it is not necessarily subject to the same level of appraisal as foreign companies for new investments. This presents a significant challenge to the efficiency and transparent administration of the sector.

Most countries designate a single lead agency for administration of the sector, with support from other agencies on related matters such as exchange control, investment authorization, planning, labor relations, and others. While in the past in Vietnam the sector was administered by both MoNRE and MOIT, the revisions to the Mineral Law under consideration—but not yet adopted—will designate MoNRE as the lead agency for sector administration. This is a positive development as it will allow requisite procedures and expertise for sector oversight to be housed in one agency, which could improve efficiency and effectiveness of administration. However, currently investors also have to work directly with several different agencies for various issues and permits at the ministry level in the central government and at the department level in the provinces. Particularly at the provincial level, significant capacity improvements will have to occur to build expertise to ensure that the procedures are properly and expeditiously carried out.

Government ownership and operation of enterprises in the extractive industries is a declining practice, especially for non-petroleum resources. Even though some countries with successful mining industries have SOEs (Codelco Chile, for example), experience has demonstrated a number of drawbacks to this approach. (See Box 6.2.) Mining companies owned and administered by government bureaucrats rarely achieve the efficiencies of private companies managed by professionals

Box 6.2. Mining concessions: The case of bauxite

A considerable degree of controversy surrounds the Prime Minister's Decision 167/QD-TTg (2007) on the master plan for bauxite and the government's announcement 2728/VPCP-QHOT (2008) relative to a bauxite-alumina project in Dak Nong and Lam Dong provinces proposed by BHP Billiton, a very large Australian company. This company has since abandoned its interest in the project. But Russian, and European companies are now said to be interested, and two Chinese plants are now operational.

Bauxite development illustrates some of the weaknesses in the present system identified in this report: concession and mine title issuance procedures, monitoring and oversight of government institutions, inadequate community consultation, and possible-large scale environmental damages that have not been fully assessed or understood. A number of issues will need to be more fully understood if this project moves forward, including pricing of bauxite and a cost-benefit analysis of processing to alumina, cross-border implications (if any) with Lao PDR and Cambodia, specific environmental considerations (red mud and tailings management), the roles and responsibilities of central and provincial agencies, personnel development, ethnic minorities, and the reporting and management of revenues and benefit streams.

Source: Decision No. 167/QD-TTg of the Prime Minister dated 11.1.2007 approving the master plan for exploration, exploitation, processing bauxite for the period from 2007 to 2015; VOV News 2008.

reporting to stockholders. Even if the companies are given clear goals and objectives, they are still subject to considerable political pressures. Accountability and accurate financial reporting are oftentimes compromised by political imperatives. Mining SOEs oftentimes incur significant losses that require subsidies from the central state budget.

And it is important to note that there is an inherent conflict of interest in the role of the state as shareholder in an SOE and impartial referee to adjudicate disputes between the company and citizens who may be affected by the company's operations. Finally, because of the close connections and ties of the SOE with other government agencies, private companies are at a competitive disadvantage when it comes to receiving mine titles and developing mines. This has the net effect of reducing introduction of new technologies and processes for the sector as well as exploration for additional mineral resources. Since Vinacomin gets its licenses directly from the central ministry, provincial authorities cannot inspect or manage what Vinacomin does on its concession area.

In light of all this, it is important to pursue and strengthen the institutional reform. The proposed designation of MoNRE as the lead agency for the minerals sector is a step in the right direction and will help to clarify today's confusion in mandates and responsibilities. As reformed and with enhanced capacity and logistical resources, MoNRE can more effectively coordinate planning for resource development, evaluate the geological resources of the country, and oversee and monitor various mineral developments and operations. Much institutional strengthening and capacity building needs to occur at the provincial level, especially with a focus on smaller mining and quarry operations.

The strengths and weaknesses of state-owned enterprises need attention. The role of SOEs in the mining sector in other countries has advantages and disadvantages. In Vietnam, Vinacomin is the principal SOE and, as such, plays a pivotal role in mining operations and potential developments. The government should be cognizant of potential weaknesses in the dominant role of Vinacomin to ensure that a "de facto" monopoly is not created and that

competition is allowed. Further, clear distinction between the roles and responsibilities of line ministries (MoNRE and MOIT) and Vinacomin needs to be established. Financial flows from operations need to be recorded and reported using not only Vietnamese accounting standards and practices but also international financial reporting and accounting practices. This will serve the interests of transparency and prudential financial management as well as enhance the ability of Vinacomin to mobilize funding on the international markets.

Theory versus Practice: The Environmental and Social Impact Assessment Process

Vietnam's law and various regulations and decrees pertaining to the environmental and social protection reflect, in many respects, best practice for mining as well as other sectors. The fundamental environmental legislation is the Law on Environmental Protection of 2005, as supplemented by various decrees and circulars.[268] This body of laws requires an Environmental Impact Assessment (EIA, which includes a chapter on social impacts, an SIA) for all industrial-sized mining projects, with the assessments evaluated and approved by the MoNRE or the provincial department. In recent years, MoNRE has reviewed around 30 EIAs for mining projects of a large industrial scale.[269] Environmental impact assessments for small mining projects are evaluated at the provincial level, though the reviews by the provincial authorities are much more problematic due to lack of understanding of the specifics of mining projects. In addition to specific requirements for projects, the law requires Strategic Environmental Assessments (SEAs) be included in all commodity "master plans"; to date, however, no SEA has been approved since this disposition took effect, though Vinacomin is said to be close to submitting an SEA for coal for approval.

As in many countries, there is a large gap between well-intentioned and well-structured legal instruments on environmental protection and the ability of the government to administer the laws. In Vietnam, the agencies responsible for evaluation of EIAs lack appropriate methodologies, guidelines, normative regulations,[270] and proper templates to review the impact assessment submissions from companies.[271] This weakness in internal staff capacity is remedied in part by requesting review by the Appraisal Council, consisting of outside academics and experts from other ministries. Monitoring and follow-up on compliance with environmental regulations is also very weak, especially at the provincial level, because of too few and inadequately trained staff as well as logistical and funding bottlenecks.

Because companies recognize that the government capacity to evaluate EIAs (and the SIAs within them) is weak, there is a tendency to prepare EIAs to simply conform to the letter of the law rather than to integrate the findings of the studies into mine planning and design. For instance, in Quang Ninh province, inspections by the district office of natural resources and environment found that only 38 out of 68 coal mines have produced EIAs and that few companies have up-to-date versions (as required by the law) even if an initial report was prepared.[272] The situation is even worse for small-scale operations, which do not file EIAs at all and, even if they did, would not comply with the stipulations.

The reform agenda therefore includes closing the gap between theory and practice in the EIA/SEA Process. In order to put the environmental review process into effective operation, the government needs to put into place training and capacity building programs for relevant government staff, to develop appropriate templates and criteria for evaluation, and to provide logistical and other support for site visits to mining operations. The necessity for capacity building is especially needed for certain provincial authorities where mining activities are strong.

Physical Environmental and Social Impacts

Mining activities are well known to have significant impacts on the physical environment. Waste management, tailings impoundment, soil pollution, acid drainage, and air and water pollution are some of the ongoing issues with any mining operation.

In Vietnam, the physical environmental impacts are particularly evident in the coal mining sector. (See also the Annex.) The impacts are evident in both the large and small-scale (and oftentimes illegal) operations. Some 285 million tons of waste rock and soil were discharged by coal in 2008.[273] Dust pollution from the coal mining operations are determined to be five times the permitted standards at the mine site and over three times the permitted standards in the residential areas. This has significant health impact on residents of the coal mining areas (Quang Ninh province, in particular). Some studies[274] suggest that 60 percent of the people in Vietnam who suffer from silicosis and chronic bronchitis come from the coal mining areas.

The land acquired for the mine site, waste dumps, and facilities can be significant: at four coal mines, more than 3,000 hectares have been acquired; if this is virgin land it may not have a large cost, but prime agricultural land would have a significant cost. Wastewater, the result of washing the coal or discharge from tailings impoundment facilities, is a serious problem in the coal mining centers. In Dong Trieu district, half of the 25 reservoirs are judged "acidic" based on ph levels of less than 3.5 compared with the standard of 5.0–5.5. Rice yields in some localities have decreased significantly in some localities: 30 quintals per hectare instead of 45 in years past.[275]

Mining also has significant "social" impacts on communities within the "footprint" of the mining development. Some of these include in-migration, "have" versus "have-not" dynamics in villages, changes to household expenditure patterns and preferences, disturbances to social and family hierarchies, loss of traditional livelihoods or other economic activities, dependence on unsustainable infrastructure, and social behaviors. Negative social impacts on livelihoods in communities surrounding mining areas have been seen, for example, in Lao Cai, Binh Dinh, Thai Nguyen, Son La where industrial mining activities are being conducted. These impacts are reasonably well studied and understood in many countries, though governments and companies are generally not as far along in dealing with the social aspects as they are the physical environmental aspects. This is true for other countries as well as Vietnam.

Vietnam requires an environmental protection fee to be collected, which varies from $0.02 to $9.00 per cubic meter or ton of ore mined.[276] The fee for solid minerals goes to the provincial state budget, which is supposed to use it to support and protect the environment of the province. In some provinces, fees for clean up and rehabilitation are collected. But it is difficult to assess the future cost of cleanup, so the fees collected at present may not be sufficient for the task in future. The fees are also supposed to be used for prevention activities, yet most of the funds are spent on remedying existing pollution problems and land degradation. For instance, some titanium mining enterprises in Binh Dinh province have paid only a portion of the fees required as per the mining plans, and the local People's Committee used the money to simply rehabilitate a small portion of the road from the main highway to the mining site, rather than establish mechanisms to prevent the deterioration in the road surface in the first instance.

Vinacomin, the largest coal producer in Vietnam, recognizes its environmental responsibilities and requires its operating units and subsidiaries to set aside 1 percent of total expenditures for production of services and goods to be dedicated to cleanup and environmental protection at its operations.[277] While this

approach is useful, it would be more appropriate to require precise environmental management plans of each operating unit—plans that would be costed and implemented on an annual basis, adjusting for price and operational cost considerations. This is the approach used in most countries with large-scale coal mining operations.

Many governments require companies to post financial sureties or otherwise reserve and put aside funds to cover the costs of cleanup and closure of mining operations in addition to paying for the costs of any environmental remediation during exploitation. In Quang Ninh province, the approval of rehabilitation and reclamation plans for coal mines had not been approved as of January 2010 and hence no bond has been posted. Government agencies at the central and provincial level also complain that the regulations and guidelines in place to administer the establishment of the bond and sureties are imprecise, confusing, and difficult to follow.

Legislation to address the social impacts of mining is not as well developed as for physical environmental impacts, and the enforcement of standards is even weaker. For instance, mines established before the Law on Environment of 2005 carried out little or no consultation with the local communities. The regulations also are silent on the nature of the consultations, who should be involved, the type of reporting on decisions, and the mandates of the participants. In theory, project owners must write to local authorities and fatherland fronts for their comments, according to Decree No. 80. However, the comments given by local authorities and fatherland fronts have no empirical basis, because they have not conducted indigenous community consultations.

Regulations and guidelines on compensation levels for local communities for land acquired for mining operations or affected by the operations exist, but the compensation rates are oftentimes below fair market value for the alternative land use of the area. Currently, there are no legally binding rules for companies to make contributions for "in-kind" support, for instance for schools, dispensaries, and infrastructure. However, the proposed revisions to the Minerals Law now require that companies make a contribution to infrastructure development in local communities. In addition, many companies have internal policies related to corporate social responsibility. These policies guide company operations in the countries where they operate and provide guidelines for company contributions to local communities. (See Box 6.3.) Finally, communities may benefit from some of the tax payments in the form of special social target programs: education (scholarships for poor students) and other in-kind direct supports. In addition, communities receive the normal benefits of government services, such as security, infrastructure, education, medical care, and other services provided by the government.

The reform agenda should thus include efforts by governments at the central and provincial levels to tighten up on the effective application of the fees charged mining operators for environmental damage caused by operations and eventual cleanup and rehabilitation of site. Further, the government needs to adopt regulations concerning the application of the financial surety and bond system required for mining operators, in particular concerning reimbursement of funds not used for cleanup purposes, with regular adjustments of the funds to be posted as surety based on environmental management plans.

In some countries, Canada for example, mining companies enter into binding Community Development Agreements (CDA) directly with the communities in which they operate. These agreements specify the mutual obligations of the parties, the community, and the company to provide and operate certain services, manage company contributions to social and community infrastructure, and establish the fiduciary responsibilities for reporting and accounting of funds. These CDAs greatly facilitate company

Box 6.3. Community social responsibility: The case of Talisman Energy

Though active in the oil sector, the community social responsibility profile of Talisman Energy is indicative of what contributions could be achieved from solid minerals in terms of community contributions, even though on a smaller scale.

In 2009, Talisman contributed over $6.3 million to community projects. In addition, the company and its employees around the world have also generously contributed $1 million to other charity work, such as United Way of Calgary, or to Haiti relief ($135,000) through Canada Red Cross.

In Vietnam, in line with the government's human capital development programs, Talisman provides scholarships for Vietnamese students and other educational activities. It supports safety standards for employees and communities (landmine clearance for a community in Quang Binh Province and helmets for kids across the country), environment protection (standards and codes in construction to promote energy saving and low carbon dioxide emissions as a means of climate change, mitigation), and community health (Operation Smile and heart operations for disadvantaged children).

Globally, each Talisman employee or contractor is entitled to $485 annually to volunteer and support community work. Talisman's staff members in Vietnam have been actively engaged with the community by coming to Phu Yen to help victims of the Mirinae typhoon, helping children suffering from leukemia hospitalized in Ho Chi Minh City, and helping orphans and disadvantaged children to realize their education.

Source: Talisman Energy, CSR Reports.

operations and the management of community benefits, and they should be established in Vietnam.[278]

Equitable Development and Distribution of Benefit Streams

The benefit streams from any mining operation include fiscal benefits (taxes, royalties, other payments) to the central and provincial government, jobs and direct/indirect/induced employment, spin-off businesses and industries (both tradable and non-tradable goods and services), infrastructure provision and usage, and improvements in overall living standards and conditions. Unfortunately, in Vietnam, as in many other countries, precise data and information on a nationwide or industry basis of the benefit streams from mining projects are not available. Despite the lack of such generalized information, it is possible to discuss some of the salient practices in Vietnam in terms of management of fiscal revenues as well as individual company contributions to wider benefit streams.

The current management of fiscal receipts from mining in Vietnam has the characteristics of a centralized planning economy. The Ministry of Finance controls the planning, assessment, collection, and disbursement of tax revenues. On an annual basis, each central ministry and each of the 63 provinces will set out its operational plan and budget for the year. This budget is then discussed with Ministry of Finance for adjustment and approval. All taxes, fees, and other fiscal receipts flow back to either the central State Treasury or the provincial treasuries.

Budget reforms over the last years have changed

the previous centralized system of disbursements. Presently, local governments decide the disbursement of more than 50 percent of total annual state budget. In addition, internal regulations of the State Treasury and Ministry of Finance regulate the limited number of taxes that provincial governments can receive directly. For instance, provinces may receive a credit for 3 percent of the 10 percent value added tax collected in the province and retain 100 percent of environmental protection fees due in the provinces.[279]

Vietnam is not alone in lacking data on the overall economic and social impacts of mining: most countries do not have sufficient data in this regard. Nonetheless, it is clear that these impacts are large and consistent over the life of the mine. The government should develop templates for the reporting of this data, require regular reports and updates from mining operators, and coordinate these data with that gathered by other government agencies as, for example, education and health. The goal should be to collect data not only on a project-specific basis but also on a provincial and national basis and to relate this data to development outcomes and ultimately to the Millennium Development Goals.

The Extractive Industries Transparency Initiative (EITI) was established in 2005 as a means to disclose taxes paid by extractive industry companies and taxes received by governments. The EITI is governed by a board of directors and a secretariat in Oslo, Norway. To date, some 38 countries have subscribed to the principles of the EITI and are in the process of implementing the initiative. Upon successful completion of the steps in the process, countries are certified as EITI-compliant. This has the great advantage of demonstrating that the extractive industry sector is in fact contributing taxes to the government and demonstrating internationally and locally that good governance procedures are in place for the sector. Vietnam should consider endorsing and implementing the EITI.[280]

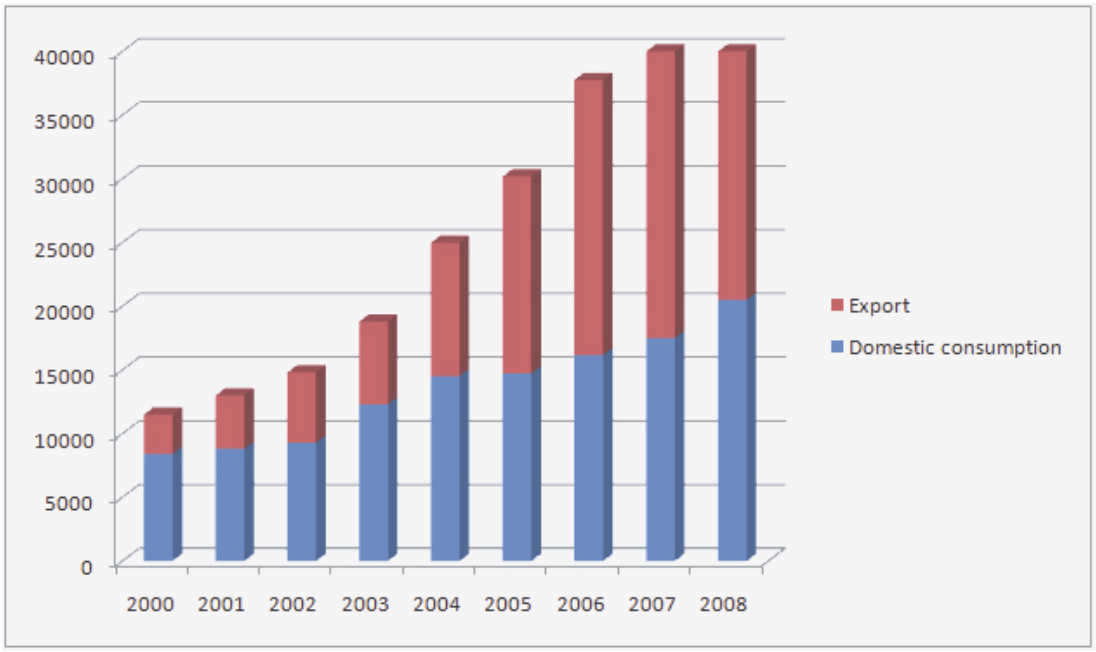
Annex. Case Study: Coal

Coal has been mined in Vietnam for the past 130 years, beginning under French colonial rule in 1883. It is by far the dominant mineral commodity produced in the country. Vietnam produces all varieties of coal, from lowest to highest grade: peat, lignite (Braunkohle), sub-bituminous through bituminous (Flammkohle, Gasflammkohle, Gashohle, Fettkohle, Esskohle, Magerkohle), and anthracite (Anthrazit).[281] Mining of coal takes place in 10 provinces and areas,[282] principally in the northeastern part of the country. Extraction is both opencast (60 percent) and underground (40 percent) mining methods. Vietnam is the largest producer of anthracite in Asia; most of the production is exported to China. In 2008, some 38,5 million tons of commercial coal was produced, of which approximately 50 percent was exported, accounted for 0.57 percent of the world coal production, which is very modest.

Since 2000 Vietnam's coal industry has undergone rapid expansion, growing at well over 10 percent a year. The expansion is primarily due to demand for Vietnam's high-quality exported anthracite, which commands a premium on the international market. (See Figure 6.1.) Total sales revenues generated by anthracite exports were $1.4 billion in 2008.[283] Growth in coal production is also due to continued high domestic demand for coal as an energy source for power generation and cement manufacturing. However, exported coal commands a premium price that is two to three times the prices paid for domestically used coal.

The structure of the Vietnamese coal mining industry has undergone significant changes since 2000. During the colonial period and until 1995 coal mining was a monopoly of the state. In 1995, the Vietnam Coal Corporation was established, which in turn has been owned 100 percent by Vinacomin since 2005. Over the past five years, Vinacomin's investment has increased eightfold and paid-in capital grew four times, but the before-tax profit remained unchanged and

Figure 6.1. Evolution of Vietnam's coal industry, 2000–2008



Source: The consumption department of Vinacomin.

the profit-to-capital ratio decreased four times.[284] In July 2008, the Prime Minster issued a decree approving the strategy for coal development for the period 2015 to 2025. This calls for the assessment and development of coal resources in the Red River basin below a depth of 300 meters and the goal of achieving overall output of coal of 80 million tons by 2025. If the strategy is followed, and assuming international markets remain buoyant, the coal mining sector in Vietnam will expand rapidly over the next 15 years.

The case of coal in Vietnam illustrates many of the thematic issues discussed in the mining chapter:

- **Development of new extraction technologies and exploration.** The Vietnamese coal industry is reasonably efficient at its traditional extraction, processing, and export operations. Some improvements in exploitation efficiencies can be achieved at these operations, however, through the introduction of new technologies, and the planned expansion to new exploitation areas needs the introduction of new and advanced technologies. Specifically, the planned expansion to the Red River valley needs additional exploration to prove reserves.

  Also, the extraction of these resources will prove challenging given the shallow depth in river delta environment and the possible disturbances to agricultural surface lands. Particularly, investigations need to be carried out at this site as well as others in Vietnam on the introduction of methane gas extraction technologies for both underground and open cast operations. The introduction of these modern technologies would contribute to the

country's actions on the climate change mitigation agenda. It is noted that Vinacomin is working on the gasification of coal in the Red River basin in a consortium with LincEnergy (Australia) and Marubeni Corporation (Japan) since 2008 on a $ 6.5-million investment in trial exploitation.

- **Inadequate sector supervision.** Illegal coal mining has increased dramatically in recent years. Customs statistics from China on coal imports from Vietnam are considerably larger than the amounts declared in official statistics. Some Vietnamese estimates are that as much as 10 million tons of coal was exported to China illegally.[285] Illegal coal mining and exports are a consequence of implementing the licensing and management reforms provided for in the minerals legislation without adequate capacity and clear mandates of the central regulatory bodies. This is evidenced by the dominant role of the state-owned enterprises (Vinacomin) as operators and regulators of the industry. For instance, Vinacomin subcontracts with private contractors for some of its excavation and transport activities or sublicenses a company to exploit a coal seam and outcrop on its permit area without adequate supervision. In the investment law, coal mining is classified as a "conditional business" so that local governments could also license private sector companies and operators.
- **Regional disparities in benefit distributions.** Coal contributes significantly to the economic development of the provinces where it takes place but it can also exacerbate regional disparities in economic development. In Quang Ninh province (a principal anthracite production area), economic growth averaged over 12 percent a year for the period 2006–10, which is much higher than many other provinces and 1.6 times higher than the national average over the same period. Nationally, the coal industry has created around 125,000 direct jobs, and employees earn roughly 10 times the Vietnamese minimum wage.[286] It is noted that the coal mines in Quang Ninh province have also help create numerous ancillary industries and activities that also provide employment and job opportunities. The income from the mines has helped to reduce poverty and increase the well-being of residents.

  For instance, near the operations of the Nui Beo Coal company in Quang Ninh province, the percentage of households living below the poverty line decreased from 7.4 percent in 2007 to 4.6 percent in 2009, with a target to fall below 5 percent by 2010. The rural population's access to clean water supply stood 80 percent in 2010, up from around 70 to75 percent previously. The percentage of trained and skilled workers in Quang Ninh province was 42 percent, compared with the national average of 30 percent. Finally, given the projections for growth of the coal mining sector, the number of employed persons will also substantially increase and reach around 300,000 employees by 2025.[287]

- **Pollution and Emissions.** [288] Coal mining in any country has significant environmental impacts. Some of the significant impacts in Vietnam include:
  - *Airborne emissions of methane gas, smoke pollution, and dust.* Gases emitted contribute to global warming potential through CO_2, N_2O, and CH_4. When combined with water, "acid rain" can be caused.
  - *Wastewater and other pollutants.* When water comes into contact with heavy metals present in the mined materials or waste rock, it can contaminate surface and ground water. In addition, in many areas mining takes place close to urban dwellings, and rain runoff generally

carries large amounts of dust, soil, and contaminants. There are estimates[289] of 2.4–3 cubic meters of wastewater created for each ton of coal produced.

- *Tailings and waster rock management*. An estimated 50 million tons of waste rock is produced through coal mining in Vietnam. Disposal, impoundment, and management of this waste rock poses a problem, since disposal areas can be near populated areas, and slopes and dams need to be stabilized.

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STATISTICAL APPENDIX

Table 1.1: POPULATION
(thousand persons)

Year	Population (mid-year)	Growth Rate	By sex		By area	
			Male	Female	Urban	Rural
1976	49,160	2.35	23,597	25,563	10,127	39,033
1977	50,237	2.19	24,197	26,039	10,116	40,114
1978	51,337	2.19	24,813	26,524	10,105	41,226
1979	52,462	2.19	25,444	27,018	10,094	42,368
1980	53,630	2.23	26,047	27,583	10,295	43,335
1981	54,824	2.23	26,665	28,159	10,499	44,324
1982	56,045	2.23	27,297	28,747	10,708	45,336
1983	57,292	2.23	27,944	29,348	10,921	46,371
1984	58,568	2.23	28,607	29,961	11,138	47,429
1985	59,872	2.23	29,285	30,587	11,360	48,512
1986	61,109	2.07	29,912	31,197	11,817	49,292
1987	62,452	2.20	30,611	31,841	12,271	50,181
1988	63,727	2.04	31,450	32,277	12,662	51,065
1989	64,774	1.64	31,589	33,185	12,919	50,801
1990	66,017	1.92	32,203	33,814	12,880	53,136
1991	67,242	1.86	32,814	34,428	13,228	54,015
1992	68,450	1.80	33,242	35,208	13,588	54,863
1993	69,645	1.74	34,028	35,616	13,961	55,683
1994	70,825	1.69	34,633	36,191	14,426	56,399
1995	71,996	1.65	35,237	36,758	16,938	55,057
1996	73,157	1.61	35,857	37,299	15,420	57,737
1997	74,037	1.20	36,473	37,564	16,835	57,202
1998	75,456	1.92	37,090	38,367	17,465	57,992
1999	76,597	1.51	37,662	38,935	18,082	58,515
2000	77,631	1.35	38,165	39,466	18,725	58,905
2001	78,621	1.28	38,657	39,964	19,299	59,322
2002	79,539	1.17	39,113	40,426	19,873	59,665
2003	80,468	1.17	39,536	40,933	20,725	59,743
2004	81,438	1.20	40,043	41,395	21,601	59,836
2005	82,394	1.17	40,522	41,871	22,332	60,061
2006	83,313	1.12	41,000	42,313	23,046	60,267
2007	84,221	1.09	41,449	42,773	23,747	60,474
2008	85,122	1.07	41,958	43,164	24,674	60,449
2009/e	86,025	1.06	42,597	43,427	25,466	60,559

Source : GSO (2010)

Table 1.2: POPULATION BY SEX AND LOCALITY IN 2009
(thousand persons)

Provinces/ Cities	Total	By sex		By locality	
		Male	Female	Urban	Rural
Ha Noi	6,472	3,188	3,285	2,642	3,831
Hai Phong	1,842	913	929	849	993
Ha Giang	727	364	363	87	640
Tuyen Quang	728	366	362	94	634
Cao Bang	512	253	260	89	424
Lang Son	733	366	368	142	591
Lai Chau	371	190	181	53	318
Dien bien	493	247	246	75	418
Lao Cai	615	309	306	130	484
Yen Bai	743	372	372	145	599
Bac Can	295	149	146	48	247
Thai nguyen	1,127	560	567	289	839
Son La	1,084	547	537	151	933
Hoa Binh	789	392	397	20	769
Vinh Phuc	1,003	497	506	225	778
Phu Tho	1,317	650	666	210	1,107
Bac ninh	1,027	504	522	242	784
Bac Giang	1,560	778	782	150	1,410
Quang Ninh	1,147	587	560	577	570
Hai Duong	1,707	835	872	326	1,381
Hung Yen	1,131	555	576	139	992
Thai Binh	1,784	863	921	176	1,608
Nam Dinh	1,826	896	930	324	1,503
Ha Nam	786	386	401	77	709
Ninh Binh	900	448	452	161	739
Thanh Hoa	3,405	1,686	1,720	355	3,050
Nghe An	2,919	1,452	1,467	369	2,551
Ha Tinh	1,230	610	621	184	1,046
Quang Binh	848	425	423	128	720
Quang Tri	599	297	302	165	434
Thua Thien - Hue	1,089	538	551	393	696
Quang Nam	1,421	693	728	265	1,157
Da Nang	890	439	451	773	117
Quang Ngai	1,219	601	618	179	1,040
Binh Dinh	1,489	728	761	414	1,075
Phu Yen	863	432	431	189	674
Khanh Hoa	1,160	574	586	461	699
Ninh Thuan	566	282	284	204	361
Binh Thuan	1,172	592	580	462	710
Gia Lai	1,278	643	635	365	913

Table 1.2: POPULATION BY SEX AND LOCALITY IN 2009
(thousand persons)

Provinces/ Cities	Total	By sex		By locality	
		Male	Female	Urban	Rural
Kon Tum	433	220	213	146	286
Dac Lac	1,733	876	857	389	1,344
Dac Nong	492	256	236	73	419
Lam Dong	1,189	597	592	450	739
Ho Chi Minh City	7,165	3,446	3,719	5,964	1,201
Binh Duong	1,497	720	777	448	1,049
Tay Ninh	1,068	532	536	169	899
Binh Phuoc	877	446	432	147	730
Dong Nai	2,491	1,266	1,225	828	1,663
Baria - Vung Tau	997	499	498	196	801
Long An	1,438	714	724	252	1,187
Dong Thap	1,668	833	834	287	1,380
An Giang	2,149	1,070	1,080	610	1,539
Tien Giang	1,674	823	851	230	1,443
Ben Tre	1,256	616	639	126	1,130
Vinh Long	1,030	508	522	159	871
Tra Vinh	1,004	496	509	154	850
Can Tho	1,190	591	599	783	406
Hau giang	758	381	377	150	608
Soc Trang	1,293	643	650	252	1,041
Kien Giang	1,688	852	836	454	1,234
Bac Lieu	858	428	430	226	632
Ca Mau	1,207	608	599	247	960

Note: Population by sex and by area may not add to the total due to the possible exclusion of the armed force and migrant workers.

Source : GSO (2010)

Table 1.3: EMPLOYED POPULATION AT 15 YEARS OF AGE AND ABOVE
(thousand of persons)

	2005	2006	2007	rev. 2008	est. 2009
Total Employment	42,775	43,980	45,208	46,461	47,744
State	4,967	4,916	4,988	5,059	5,031
Non-state	37,808	39,064	40,220	41,402	42,713
State Sector Employment	4,967	4,916	4,988	5,059	5,031
Central	2,585	2,560	2,570	2,578	2,538
Local	2,383	2,356	2,418	2,482	2,493
Employment by Sector					
Agriculture, forestry and fisheries	25,424	24,350	24,369	24,448	24,789
Industry and Construction	7,825	8,459	9,032	9,678	10,284
Services	9,526	11,171	11,806	12,335	12,671

Note: Figures are rounded
Source: GSO (2010)

Table 2.1: GDP BY INDUSTRIAL ORIGIN AND BY ECONOMIC SECTOR
(VND billion at current prices)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total	613,443	715,307	839,211	974,266	1,143,715	1,485,038	1,658,390
State	239,736	279,704	322,241	364,250	410,883	527,732	582,674
Non-State	373,707	435,603	516,970	610,016	732,832	957,306	1,075,716
Agriculture, Forestry and Fisheries	138,285	155,993	175,984	198,798	232,586	329,886	346,786
Agriculture and Forestry	114,160	128,519	143,037	160,463	186,462	271,477	285,030
Fisheries	24,125	27,474	32,947	38,335	46,124	58,409	61,756
Industry and Construction	242,126	287,616	344,224	404,697	474,423	591,608	667,323
Mining	57,326	72,492	88,897	99,702	111,700	146,607	165,310
Manufacturing	125,476	145,475	173,122	207,027	243,142	302,136	333,166
Electricity and Water	22,224	25,091	28,929	33,464	39,869	47,169	58,592
Construction	37,100	44,558	53,276	64,503	79,712	95,696	110,255
Services	233,032	271,698	319,003	370,771	436,706	563,544	644,281
Trade	83,297	96,995	113,768	132,794	156,442	212,139	244,933
Hotel and Restaurant	18,472	22,529	29,329	35,861	44,992	57,067	67,394
Transportation and Communication	24,725	30,402	36,629	43,825	51,118	66,359	72,412
Finance, Banking and Insurance	10,858	12,737	15,072	17,607	20,756	27,215	31,617
Science and Technology	3,694	4,315	5,247	6,059	7,065	9,296	10,581
Real Estate and Renting	27,287	31,304	33,635	36,814	43,509	53,743	60,234
Public Administration	16,676	19,061	23,037	26,737	31,310	41,279	47,042
Education and Training	21,403	23,335	26,948	30,718	34,843	38,261	42,780
Healthcare and social welfare	8,865	10,851	12,412	14,093	16,160	19,178	21,537
Culture and Recreation	3,376	3,693	4,158	4,617	5,200	5,842	6,964
Party and Association	774	885	1,054	1,217	1,425	1,909	2,046
Community and Social service	12,497	14,354	16,293	18,789	21,959	28,704	33,843
Private Household Employment	1,108	1,237	1,421	1,640	1,927	2,551	2,898

Source : GSO (2010)

Table 2.2: GDP BY INDUSTRIAL ORIGIN AND BY ECONOMIC SECTOR
(VND billion at constant 1994 prices)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total	336,242	362,435	393,031	425,373	461,344	490,458	516,568
State	138,160	148,865	159,836	169,696	179,718	187,561	195,046
Non-State	198,082	213,570	233,195	255,677	281,626	302,897	321,522
Agriculture, Forestry and Fisheries	70,827	73,917	76,888	79,723	82,717	86,587	88,168
Agriculture and Forestry	62,350	64,717	66,707	68,751	70,585	73,795	74,828
Fisheries	8,477	9,200	10,181	10,972	12,132	12,792	13,340
Industry and Construction	129,399	142,621	157,867	174,259	192,065	203,554	214,799
Mining	20,611	22,437	22,854	22,987	21,904	21,065	22,669
Manufacturing	71,363	79,116	89,338	100,436	113,801	124,935	128,386
Electricity and Water	8,944	10,015	11,247	12,604	13,485	14,842	16,181
Construction	28,481	31,053	34,428	38,232	42,875	42,712	47,563
Services	136,016	145,897	158,276	171,391	186,562	200,316	213,601
Trade	54,747	59,027	63,950	69,418	75,537	80,654	86,847
Hotel and Restaurant	10,646	11,511	13,472	15,145	17,086	18,579	19,005
Transportation and Telecom	12,925	13,975	15,318	16,870	18,793	21,031	22,815
Finance, Banking and Insurance	6,935	7,495	8,197	8,867	9,651	10,631	11,556
Science and Technology	2,044	2,196	2,368	2,543	2,738	2,906	3,092
Real Estate and Renting	13,796	14,396	14,816	15,252	15,872	16,268	16,684
Public Administration	9,228	9,773	10,477	11,270	12,186	12,974	13,918
Education and Training	11,260	12,125	13,127	14,231	15,477	16,710	17,807
Healthcare and social welfare	4,853	5,234	5,640	6,082	6,572	7,082	7,559
Culture and Recreation	1,857	1,997	2,163	2,329	2,518	2,697	2,891
Party and Association	372	395	423	454	491	525	560
Community and Social service	6,743	7,141	7,655	8,210	8,860	9,419	9,974
Private Household Employment	610	632	670	720	781	840	893

Source : GSO (2010)

Table 2.2B: GDP BY INDUSTRIAL ORIGIN -- GROWTH RATE
(in percent)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total	7.3	7.8	8.4	8.2	8.5	6.3	5.3
State	7.6	7.7	7.4	6.2	5.9	4.4	4.0
Non-State	7.1	7.8	9.2	9.6	10.1	7.6	6.1
Agriculture, Forestry and Fisheries	3.6	4.4	4.0	3.7	3.8	4.7	1.8
Agriculture and Forestry	3.1	3.8	3.1	3.1	2.7	4.5	1.4
Fisheries	7.7	8.5	10.7	7.8	10.6	5.4	4.3
Industry and Construction	10.5	10.2	10.7	10.4	10.2	6.0	5.5
Mining	6.3	8.9	1.9	0.6	-4.7	-3.8	7.6
Manufacturing	11.5	10.9	12.9	12.4	13.3	9.8	2.8
Electricity and Water	11.9	12.0	12.3	12.1	7.0	10.1	9.0
Construction	10.6	9.0	10.9	11.0	12.1	-0.4	11.4
Services	6.5	7.3	8.5	8.3	8.9	7.4	6.6
Trade	6.8	7.8	8.3	8.6	8.8	6.8	7.7
Hotel and Restaurant	5.1	8.1	17.0	12.4	12.8	8.7	2.3
Transportation and Telecom	5.5	8.1	9.6	10.1	11.4	11.9	8.5
Finance, Banking and Insurance	8.0	8.1	9.4	8.2	8.8	10.2	8.7
Science and Technology	7.1	7.4	7.8	7.4	7.7	6.1	6.4
Real Estate and Renting	5.3	4.3	2.9	2.9	4.1	2.5	2.6
Public Administration	5.2	5.9	7.2	7.6	8.1	6.5	7.3
Education and Training	7.5	7.7	8.3	8.4	8.8	8.0	6.6
Healthcare and social welfare	8.7	7.9	7.8	7.8	8.1	7.8	6.7
Culture and Recreation	8.9	7.5	8.3	7.7	8.1	7.1	7.2
Party and Association	5.4	6.2	7.1	7.3	8.1	6.9	6.7
Community and Social service	6.1	5.9	7.2	7.3	7.9	6.3	5.9
Private Household Employment	3.6	3.6	6.0	7.5	8.5	7.6	6.3

Source : GSO (2010)

Table 2.3A: GDP DEFLATOR

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total	1.8	2.0	2.1	2.3	2.5	3.0	3.2
State	1.7	1.9	2.0	2.1	2.3	2.8	3.0
Non-State	1.9	2.0	2.2	2.4	2.6	3.2	3.3
Agriculture, Forestry and Fisheries	2.0	2.1	2.3	2.5	2.8	3.8	3.9
Agriculture and Forestry	1.8	2.0	2.1	2.3	2.6	3.7	3.8
Fisheries	2.8	3.0	3.2	3.5	3.8	4.6	4.6
Industry and Construction	1.9	2.0	2.2	2.3	2.5	2.9	3.1
Mining	2.8	3.2	3.9	4.3	5.1	7.0	7.3
Manufacturing	1.8	1.8	1.9	2.1	2.1	2.4	2.6
Electricity and Water	2.5	2.5	2.6	2.7	3.0	3.2	3.6
Construction	1.3	1.4	1.5	1.7	1.9	2.2	2.3
Services	1.7	1.9	2.0	2.2	2.3	2.8	3.0
Trade	1.5	1.6	1.8	1.9	2.1	2.6	2.8
Hotel and Restaurant	1.7	2.0	2.2	2.4	2.6	3.1	3.5
Transportation and Telecom	1.9	2.2	2.4	2.6	2.7	3.2	3.2
Finance, Banking and Insurance	1.6	1.7	1.8	2.0	2.2	2.6	2.7
Science and Technology	1.8	2.0	2.2	2.4	2.6	3.2	3.4
Real Estate and Renting	2.0	2.2	2.3	2.4	2.7	3.3	3.6
Public Administration	1.8	2.0	2.2	2.4	2.6	3.2	3.4
Education and Training	1.9	1.9	2.1	2.2	2.3	2.3	2.4
Healthcare and social welfare	1.8	2.1	2.2	2.3	2.5	2.7	2.8
Culture and Recreation	1.8	1.8	1.9	2.0	2.1	2.2	2.4
Party and Association	2.1	2.2	2.5	2.7	2.9	3.6	3.7
Community and Social service	1.9	2.0	2.1	2.3	2.5	3.0	3.4
Private Household Employment	1.8	2.0	2.1	2.3	2.5	3.0	3.2

Source : GSO (2010)

Table 2.3B: CHANGE IN GDP DEFLATOR
(in percent)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total	6.7	8.2	8.2	7.3	8.2	22.1	6.0
State	8.3	8.3	7.3	6.5	6.5	23.1	6.2
Non-State	5.7	8.1	8.7	7.6	9.1	21.5	5.9
Agriculture, Forestry and Fisheries	8.2	8.1	8.5	8.9	12.8	35.5	3.2
Agriculture and Forestry	7.5	8.5	8.0	8.8	13.2	39.3	3.5
Fisheries	10.1	4.9	8.4	8.0	8.8	20.1	1.4
Industry and Construction	6.3	7.8	8.1	6.5	6.4	17.7	6.9
Mining	16.9	16.2	20.4	11.5	17.6	36.5	4.8
Manufacturing	2.0	4.6	5.4	6.4	3.7	13.2	7.3
Electricity and Water	9.1	0.8	2.7	3.2	11.4	7.5	13.9
Construction	6.3	10.2	7.8	9.0	10.2	20.5	3.5
Services	6.2	8.7	8.2	7.3	8.2	20.2	7.2
Trade	3.1	8.0	8.3	7.5	8.3	27.0	7.2
Hotel and Restaurant	2.4	12.8	11.2	8.8	11.2	16.6	15.4
Transportation and Telecom	11.1	13.7	9.9	8.6	4.7	16.0	0.6
Finance, Banking and Insurance	3.0	8.5	8.2	8.0	8.3	19.0	6.9
Science and Technology	14.7	8.7	12.8	7.5	8.3	24.0	7.0
Real Estate and Renting	6.0	9.9	4.4	6.3	13.6	20.5	9.3
Public Administration	14.7	7.9	12.7	7.9	8.3	23.8	6.2
Education and Training	10.2	1.2	6.7	5.1	4.3	1.7	4.9
Healthcare and social welfare	15.6	13.5	6.2	5.3	6.1	10.1	5.2
Culture and Recreation	3.8	1.7	4.0	3.1	4.2	4.9	11.2
Party and Association	3.2	7.7	11.2	7.6	8.3	25.3	0.5
Community and Social service	3.2	8.5	5.9	7.5	8.3	23.0	11.3
Private Household Employment	3.2	7.8	8.4	7.4	8.3	23.1	6.9

Source: GSO (2010)

Table 2.4A: NATIONAL ACCOUNTS: SOURCES AND USES
(VND billion at current prices)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Sources	664,671	769,307	874,299	1,018,704	1,325,017	1,710,865	1,830,052
GDP	613,443	715,307	839,211	974,266	1,143,715	1,485,038	1,658,389
Trade Balance	51,228	54,000	35,088	44,438	181,302	225,827	171,663
Uses	664,731	769,307	874,299	1,018,704	1,325,017	1,710,865	1,830,052
Total Consumption	445,221	511,221	584,793	675,916	809,862	1,091,876	1,206,818
Gross Capital Formation	217,434	253,686	298,543	358,629	493,300	589,746	632,326
Statistical Discrepancy	2,076	4,400	-9,037	-15,841	21,855	29,243	-9,092

Source : GSO (2010)

Table 2.4B: NATIONAL ACCOUNTS: SOURCES AND USES
(VND billion at constant 1994 prices)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Sources	367,691	392,558	417,469	455,924	548,166	592,243	610,016
GDP	336,243	362,435	393,031	425,373	461,344	490,458	516,568
Trade Balance	31,448	30,123	24,438	30,551	86,822	101,785	93,448
Uses	367,691	392,558	417,469	455,924	548,166	592,244	610,016
Total Consumption	243,515	260,940	280,104	303,520	335,776	366,595	381,374
Gross Capital Formation	116,623	128,916	143,291	160,247	203,191	215,948	225,260
Statistical Discrepancy	7,553	2,702	-5,926	-7,843	9,198	9,701	3,382

Source : GSO (2010)

Table 3.1: BALANCE OF PAYMENTS

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Current account balance	-1,931	-1,591	-561	-163	-6,992	-10,787	-7,440
Trade balance	-2,581	-3,854	-2,439	-2,776	-10,360	-12,782	-8,306
Exports, f.o.b.	20,149	26,485	32,447	39,826	48,561	62,685	57,096
Imports, f.o.b.	22,730	30,339	34,886	42,602	58,921	75,467	65,402
Non-factor services (net)	-778	61	-296	-8	-894	-915	-1,129
Receipts	3,272	3,867	4,176	5,100	6,030	7,041	5,766
Payments	4,050	3,806	4,472	5,108	6,924	7,956	6,895
Investment income (net)	-811	-891	-1,206	-1,429	-2,168	-4,401	-4,532
Receipts	125	188	364	668	1,093	1,357	752
Payments	936	1,079	1,570	2,097	3,261	5,758	5,284
Transfers (net)	2,239	3,093	3,380	4,050	6,430	7,311	6,527
Private	2,100	2,919	3,150	3,800	6,180	6,804	6,018
Official	139	174	230	250	250	507	509
Financial account balance	3,305	2,753	3,087	3,088	17,540	12,341	11,452
Net foreign direct investment (FDI) inflows	1,450	1,610	1,889	2,315	6,550	9,279	6,900
Medium and long-term loans (net)	457	1,162	921	1,025	2,045	992	4,473
Disbursements	1,540	2,047	2,031	2,260	3,397	2,441	6,140
Amortization	1,083	885	1,110	1,235	1,352	1,449	1,667
Portfolio Investment	0	0	865	1,313	6,243	-578	128
Short-term capital (net)	1,398	-19	-588	-1,565	2,702	2,648	-49
NFA of commercial banks	1,372	35	-634	-1,535	2,623	677	-305
Errors and omissions	777	-279	-396	1,398	-349	-1,081	-12,178
Overall balance	2,151	883	2,130	4,323	10,199	473	-8,166
Financing	-2,151	-883	-2,131	-4,322	-10,199	-473	8,166

Sources: State Bank of Vietnam, IMF and World Bank

Table 3.2: MAJOR EXPORTS BY COMMODITY

(US$ million)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total Exports (F.O.B)	20,176	26,485	32,442	39,826	48,561	62,685	57,096
Rice	721	950	1,047	1,276	1,490	2,894	2,664
Quantity (000 tons)	3,813	4,060	5,250	4,643	4,558	4,742	5,958
Average Unit Value (US$/ton)	189	234	199	275	327	610	447
Crude oil	3,812	5,671	7,373	8,265	8,488	10,357	6,195
Quantity (000 tons)	17,143	19,501	17,967	16,419	15,062	13,752	13,373
Average Unit Value (US$/ton)	222	291	410	503	564	753	463
Coal	184	355	669	915	1,000	1,338	1,317
Quantity (000 tons)	7,246	11,624	17,986	29,307	31,948	19,355	24,992
Average Unit Value (US$/ton)	25	31	37	31	31	69	53
Rubber	378	641	804	1,286	1,393	1,604	1,227
Quantity (000 tons)	433	975	587	708	715	658	731
Average Unit Value (US$/ton)	872	658	1,370	1,817	1,948	2,436	1,677
Tea	60	96	97	110	131	147	179
Quantity (000 tons)	60	99	88	106	114	104	134
Average Unit Value (US$/ton)	1,002	961	1,103	1,045	1,143	1,407	1,338
Coffee	505	641	735	1,217	1,911	2,111	1,731
Quantity (000 tons)	749	975	892	981	715	1,060	1,184
Average Unit Value (US$/ton)	674	658	824	1,241	2,674	1,993	1,462
Cashew Nut	284	436	502	504	654	911	847
Quantity (000 tons)	84	105	109	127	153	165	177
Average Unit Value (US$/ton)	3,390	4,150	4,610	3,973	4,287	5,510	4,779
Black Pepper	105	152	150	190	271	311	348
Quantity (000 tons)	74	112	109	117	83	90	134
Average Unit Value (US$/ton)	1,416	1,362	1,381	1,632	3,269	3,448	2,593
Marine Products	2,200	2,401	2,739	3,358	3,763	4,510	4,251
Vegetable & Fruits	151	179	235	259	306	407	439
Textiles and Garments	3,687	4,386	4,838	5,834	7,750	9,120	9,066
Footwear	2,268	2,692	3,040	3,592	3,994	4,768	4,067
Handicraft	367	426	569	630	825	1,363	3,177
Wood products	567	1,139	1,563	1,933	2,404	2,829	2,598
Electronic and Computer parts	855	1,075	1,427	1,708	2,154	2,638	2,763
Electric cables and wires	292	389	523	705	883	1,001	885
Plastic products	154	261	350	480	711	921	808

Source : GSO (2010)

Table 3.3: MAJOR IMPORTS BY COMMODITY

(US$ million)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Total Imports (C.I.F)	25,227	31,954	36,978	44,891	62,682	80,714	69,949
Petroleum products	2,433	3,574	5,024	5,970	7,710	10,966	6,255
Quantity (000 tons)	9,995	11,050	11,478	11,213	12,850	12,964	12,706
Average Unit Value (US$/ton)	243	323	438	532	600	846	492
Fertilizers	628	824	641	687	1,000	1,473	1,415
Quantity (000 tons)	4,119	4,079	2,877	3,189	3,792	3,035	4,519
Average Unit Value (US$/ton)	152	202	223	216	264	485	313
Steel and Irons	1,657	2,573	2,931	2,936	5,112	6,721	5,361
Quantity (000 tons)	4,574	5,186	5,524	5,707	8,027	8,264	9,749
Average Unit Value (US$/ton)	362	496	531	515	637	813	550
Others							
Machinery and Equipment	5,359	5,249	5,281	6,628	11,123	13,994	12,673
Textile fiber and yarn	298	339	340	544	741	775	811
Cotton	106	190	167	219	267	467	392
Material for garment & footwear	2,034	2,253	2,282	1,951	2,152	2,355	1,932
Motor vehicles and pats	834	904	1,193	672	1,881	3,228	3,071
Motorbikes	329	452	541	557	725	764	749
Pharmaceutical material	76	100	116	133	158	158	169
Medicine	374	410	502	548	703	864	1,097
Paper of all kinds	230	248	362	475	600	753	771
Chemicals	510	683	865	1,042	1,466	1,776	1,625
Chemical products	582	706	841	1,007	1,285	1,604	1,580
Plastic materials	785	1,191	1,456	1,866	2,057	2,945	2,813
Computer and electronic components	975	1,342	1,706	2,048	2,958	3,714	3,954
Wood - sawn and log	274	539	651	775	1,016	1,098	905
Milk and dairy products	164	206	311	321	462	534	516
Animal feed and materials	421	475	594	737	1,181	1,747	1,765

Source : GSO (2010)

Table 4.1: MONETARY SURVEY

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
(in VND trillion, end of period)							
Net Foreign Assets	131.4	145.8	191.1	287.9	410.4	429.0	312.2
Foreign assets	150.5	172.3	220.5	327.0	472.3	404.8	281.2
Foreign liabilities	-19.1	-26.4	-29.4	-39.1	-61.9	24.2	31.0
Net Domestic Assets	279.8	390.3	499.6	634.7	937.9	1,193.2	1,780.2
Domestic credit	316.9	435.2	585.6	730.3	1,096.8	1,400.7	2,039.7
Net claims on government	20.1	14.9	32.5	36.5	29.1	61.4	170.4
Credit to the economy	296.7	420.3	553.1	693.8	1,067.7	1,339.3	1,869.3
Claims on state enterprises	105.4	142.9	181.3	218.5	334.2	413.8	
Claims on other sectors	191.3	277.4	371.8	475.3	733.5	925.5	
Other items, net	-37.0	-44.9	-86.0	-95.6	-159.0	-207.5	-259.5
Total liquidity (M2)	411.2	536.2	690.7	922.7	1,348.2	1,622.2	2,092.4
of which: total deposit	320.6	427.1	559.5	763.9	1,127.7	1,385.3	1,799.2
Dong liquidity	314.1	408.1	531.5	723.2	1,089.6	1,291.8	1,665.3
Currency outside banks	90.6	109.1	131.2	158.8	220.5	236.9	293.2
Deposits	223.6	299.0	400.3	564.4	869.1	1,054.9	1,372.1
Foreign currency deposits	97.1	128.1	159.2	199.5	258.6	330.4	427.1
(Annual change in percent)							
Net Foreign Assets	11.9	11.0	31.0	50.7	42.6	4.5	-27.2
Net Domestic Assets	32.2	39.5	28.0	27.0	47.8	27.2	49.2
Domestic credit	32.1	37.4	34.5	24.7	50.2	27.7	45.6
Credit to the economy	28.4	41.7	31.6	25.4	53.9	111.0	177.5
Claims on state enterprises	17.8	35.6	26.9	20.5	53.0	25.4	39.6
Claims on other sectors	35.1	45.0	34.0	27.8	54.3	23.8	
Total liquidity (M2)	25.0	30.4	28.8	33.6	46.1	20.3	29.0
of which: total deposit	25.8	33.2	31.0	36.5	47.6	22.8	29.9
Dong liquidity	33.4	29.9	30.2	36.1	50.7	18.6	28.9
Currency outside banks	22.0	20.4	20.2	21.1	38.9	7.4	23.8
Deposits	38.7	33.7	33.9	41.0	54.0	21.4	30.1
Foreign currency deposits	3.7	32.0	24.3	25.3	29.6	27.8	29.3

Source : SBV and IMF

TABLE 5.1: STATE BUDGET REVENUES

(VND billion)

		2003	2004	2005	2006	2007	rev. 2008	est. 2009
A	Total revenues and grants	158,057	198,614	238,687	264,261	315,914	416,783	442,341
I	Current revenues	145,823	180,197	219,439	244,043	282,565	377,444	398,178
II	Taxes	127,948	155,579	191,725	230,565	265,862	359,109	370,034
1	Corporate income tax	47,410	56,987	75,847	100,820	103,054	135,361	112,072
2	Individual income tax	2,951	3,521	4,234	5,181	7,422	12,940	14,329
3	Land and housing tax	359	438	515	592	711	902	1,464
4	License tax	778	657	726	794	881	1,031	1,180
5	Tax on the transfer of properties	1,817	2,607	2,797	3,363	5,690	7,404	9,658
6	Tax on land use right transfer	408	640	984	1,250	2,331	3,017	
7	Value added tax	33,130	38,814	45,878	54,773	69,899	90,197	106,524
8	Special consumption tax	8,851	12,773	15,716	17,144	17,454	21,556	29,058
9	Natural resources tax	9,719	17,398	21,236	20,232	19,922	26,676	18,642
10	Agricultural tax	151	130	132	120	113	98	67
11	Export & import tax	22,374	21,614	23,660	26,296	38,385	59,927	77,040
12	Other taxes							
III	Fees, charges and non-tax	17,875	24,618	27,714	13,478	16,703	18,335	28,144
13	Revenue from discrepancy of import prices	133	40	0	0	0	0	0
14	Fees and charges (include gasoline fee)	6,483	7,765	8,135	8,008	8,516	11,170	16,619
15	Rental of land	513	1,035	1,004	1,596	2,017	2,591	2,956
16	Others	10,746	15,778	18,575	3,874	6,170	4,574	8,569
IV	Capital revenues	9,265	15,540	15,459	16,600	29,093	32,064	37,643
VIII	Grants	2,969	2,877	3,789	3,618	4,256	7,275	6,520
B	Brought forward revenue	19,353	26,162	45,161	8,510	26,987	11,617	26,455

Source : MOF (2009)

TABLE 5.2: STATE BUDGET REVENUES

(share of GDP)

		2003	2004	2005	2006	2007	rev. 2008	est. 2009
A	Total revenues and grants	25.8	27.8	28.4	27.1	27.6	28.1	26.7
I	Current revenues	23.8	25.2	26.1	25.0	24.7	25.4	24.0
I.1	Taxes	20.9	21.7	22.8	23.7	23.2	24.2	22.3
1	Corporate income tax	7.7	8.0	9.0	10.3	9.0	9.1	6.8
2	Individual income tax	0.5	0.5	0.5	0.5	0.6	0.9	0.9
3	Land and housing tax	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	License tax	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	Tax on the transfer of properties	0.3	0.4	0.3	0.3	0.5	0.5	0.6
6	Tax on land use right transfer	0.1	0.1	0.1	0.1	0.2	0.2	0.0
7	Value added tax	5.4	5.4	5.5	5.6	6.1	6.1	6.4
8	Special consumption tax	1.4	1.8	1.9	1.8	1.5	1.5	1.8
9	Natural resources tax	1.6	2.4	2.5	2.1	1.7	1.8	1.1
10	Agricultural tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Export & import tax	3.6	3.0	2.8	2.7	3.4	4.0	4.6
12	Other taxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I.2	Fees, charges and non-tax	2.9	3.4	3.3	1.4	1.5	1.2	1.7
13	Revenue from discrepancy of import prices	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	Fees and charges	1.1	1.1	1.0	0.8	0.7	0.8	1.0
15	Rental of land	0.1	0.1	0.1	0.2	0.2	0.2	0.2
16	Others	1.8	2.2	2.2	0.4	0.5	0.3	0.5
II	Capital revenues	1.5	2.2	1.8	1.7	2.5	2.2	2.3
III	Grants	0.5	0.4	0.5	0.4	0.4	0.5	0.4
B	Brought forward revenue	3.2	3.7	5.4	0.9	2.4	0.8	1.6

Source : MOF (2010)

Table 5.3: STATE BUDGET EXPENDITURES

(VND billion)

		2003	2004	2005	2006	2007	rev. 2008	est. 2009
A	Total expenditures	162,150	187,353	229,092	267,575	341,418	433,222	527,342
I	Current expenditures	102,521	121,238	149,893	181,491	229,258	297,311	347,381
1	Administration expenditure	11,359	15,901	18,761	18,994	29,214	32,855	44,903
2	Expenditure on economic affairs & services	8,164	10,301	11,801	15,010	20,082	25,423	32,451
3	Social expenditures	50,185	55,185	74,458	91,409	115,837	144,050	180,023
3.1	Education	17,390	20,401	22,031	33,822	43,396	51,465	62,928
3.2	Training	5,491	4,942	6,580	8,376	10,378	12,082	15,177
3.3	Health	5,372	6,009	7,608	12,685	16,426	19,918	27,479
3.4	Science, technology & environment	1,853	2,362	2,584	3,235	3,667	3,859	4,611
3.5	Culture	1,258	1,584	2,099	2,024	2,346	2,713	3,200
3.6	Radio and television	1,056	1,325	1,464	1,140	1,410	1,550	1,770
3.7	Sports	648	883	879	943	1,005	1,126	1,462
3.8	Population and family planning	666	397	483	533	612	1,072	931
3.9	Social subsidies	16,451	17,282	30,730	28,651	36,597	50,265	62,465
4	Interest payment	6,395	7,217	6,621	8,913	11,100	15,477	23,880
5	Defence	13,058	14,409	16,278	22,892	28,922	34,848	40,981
6	Public security	5,745	6,576	7,266	11,150	13,817	16,920	19,403
7	Others	7,615	11,649	14,708	13,123	10,286	27,738	5,740
II	Investment expenditure	59,629	66,115	79,199	86,084	112,160	135,911	179,961
1	Capital expenditure	54,430	61,746	72,842	81,730	107,440	124,664	171,631
2	Others	5,199	4,369	6,357	4,354	4,720	11,247	8,330
B	Brought forward expenditure	16,390	34,439	10,475	22,515	20,695	26,455	17,233

Source : MOF (2010)

Table 5.4: STATE BUDGET EXPENDITURES

(share of GDP)

		2003	2004	2005	2006	2007	rev. 2008	est. 2009
	Total expenditures	26.4	26.2	27.3	27.5	29.9	29.2	31.8
I	Current expenditures	16.7	16.9	17.9	18.6	20.0	20.0	20.9
1	Administration expenditure	1.9	2.2	2.2	1.9	2.6	2.2	2.7
2	Expenditure on economic affairs & services	1.3	1.4	1.4	1.5	1.8	1.7	2.0
3	Social expenditures	8.2	7.7	8.9	9.4	10.1	9.7	10.9
3.1	Education	2.8	2.9	2.6	3.5	3.8	3.5	3.8
3.2	Training	0.9	0.7	0.8	0.9	0.9	0.8	0.9
3.3	Health	0.9	0.8	0.9	1.3	1.4	1.3	1.7
3.4	Science, technology & environment	0.3	0.3	0.3	0.3	0.3	0.3	0.3
3.5	Culture	0.2	0.2	0.3	0.2	0.2	0.2	0.2
3.6	Radio and television	0.2	0.2	0.2	0.1	0.1	0.1	0.1
3.7	Sports	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3.8	Population and family planning	0.1	0.1	0.1	0.1	0.1	0.1	0.1
3.9	Social subsidies	2.7	2.4	3.7	2.9	3.2	3.4	3.8
4	Interest payment	1.0	1.0	0.8	0.9	1.0	1.0	1.4
5	Defence	2.1	2.0	1.9	2.3	2.5	2.3	2.5
6	Public security	0.9	0.9	0.9	1.1	1.2	1.1	1.2
7	Others (including salary increase in 2007)	1.2	1.6	1.8	1.3	0.9	1.9	0.3
II	Investment expenditure	9.7	9.2	9.4	8.8	9.8	9.2	10.9
1	Capital expenditure	8.9	8.6	8.7	8.4	9.4	8.4	10.3
2	Others	0.8	0.6	0.8	0.4	0.4	0.8	0.5
B	Brought forward expenditure	2.7	4.8	1.2	2.3	1.8	1.8	1.0

Source : MOF (2010)

Table 5.5: EXTERNAL DEBT

'(US$ million, unless otherwise indicated)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Public and Publicly Guaranteed	11,383	13,505	14,208	15,641	19,253	21,817	27,929
Official Creditors							
Multilaterals	4,490	5,323	5,540	6,149	7,594	8,086	10,931
Of which IDA	2,474	3,050	3,236	3,593	4,609	4,863	6,441
Bilaterals	6,162	7,294	7,070	7,772	9,032	10,747	13,218
Private Creditors	731	888	1,598	1,721	2,626	2,983	3,779
Bonds	382	382	1,113	1,095	1,076	1,057	1,038
Commercial Banks	184	350	362	516	1,407	1,782	2,583
Other Private	165	156	122	110	144	144	158
Total Long-Term DOD	11,383	13,505	14,208	15,641	19,253	21,817	27,929
Disbursement	1,751	1,845	2,455	1,477	2,825	3,104	5,118
Payment (Debt services)	776	612	698	765	886	1,104	1,291
Principal	573	327	435	436	505	679	807
Interest	202	285	263	329	381	424	484

Source : MOF (2010)

Table 6.1A: MONTHLY CHANGE IN CONSUMER PRICES

(in percent)

Month/ Year	2003	2004	2005	2006	2007	rev. 2008	est. 2009
January	0.9	1.1	1.1	1.2	1.1	2.4	0.3
February	2.2	3.0	2.5	2.1	2.1	3.6	1.2
March	-0.6	0.8	0.1	-0.5	-0.2	3.0	-0.2
April	0.0	0.5	0.6	0.2	0.5	2.2	0.4
May	-0.1	0.9	0.5	0.6	0.7	3.9	0.4
June	-0.3	0.8	0.4	0.4	0.9	2.1	0.6
July	-0.3	0.5	0.4	0.4	0.9	1.1	0.5
August	-0.1	0.6	0.4	0.4	0.5	1.6	0.2
September	0.1	0.3	0.8	0.3	0.5	0.2	0.6
October	-0.2	0.0	0.4	0.2	0.7	-0.2	0.4
November	0.6	0.2	0.4	0.6	1.2	-0.8	0.6
December	0.8	0.6	0.8	0.5	2.9	-0.7	1.4

Source : GSO (2010)

Table 6.1B: MONTHLY CONSUMER PRICE INDEX

(January 1995 = 100)

	2003	2004	2005	2006	2007	rev. 2008	est. 2009
January	135.3	139.6	152.9	166.0	176.6	201.4	236.6
February	138.2	143.8	156.7	169.5	180.4	208.5	239.3
March	137.4	144.9	156.8	168.7	180.1	214.8	238.9
April	137.4	145.6	157.7	169.0	180.9	219.5	239.8
May	137.2	146.9	158.5	170.1	182.2	228.1	240.8
June	136.8	148.1	159.1	170.7	183.8	233.0	242.2
July	136.4	148.8	159.8	171.4	185.5	235.6	243.4
August	136.3	149.6	160.3	172.1	186.5	239.3	244.0
September	136.4	150.1	161.5	172.6	187.5	239.7	245.5
October	136.1	150.1	162.2	172.9	188.8	239.3	246.4
November	137.0	150.4	162.7	173.9	191.1	237.4	247.8
December	138.0	151.2	164.0	174.6	196.7	235.8	251.2
Annual Index	136.9	147.4	159.3	171.0	185.0	227.7	243.0
Annual Growth Rate	3.2	7.7	8.1	7.3	8.2	23.1	6.7
Dec/ Dec Growth Rate	3.0	9.5	8.5	6.5	12.6	19.9	6.5

Source : GSO (2010)

Table 6.2A: CONSUMER PRICE BY COMMODITY GROUPS

(monthly change in percent)

	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
General Index	0.3	-0.8	-0.2	0.3	0.4	0.5	0.5	0.2	0.6	0.4	0.5	1.4
Food & foodstuff	0.4	-0.1	-0.5	0.4	0.2	0.3	0.3	-0.1	0.0	0.3	0.9	2.1
of which: Food	0.0	-3.1	1.3	0.0	-0.4	-1.1	-1.1	-0.4	-0.8	0.0	2.2	6.9
Foodstuff	0.5	0.9	-1.6	0.5	0.4	0.7	0.7	-0.1	0.2	0.5	0.6	0.9
Beverage & tobacco	1.9	0.9	0.3	0.5	0.3	0.6	0.6	0.1	0.8	0.1	0.4	1.0
Garment, hats, footwear	1.5	0.9	0.2	0.2	0.3	0.5	0.5	0.5	0.7	0.3	0.3	0.8
Housing & construction materials	0.8	-4.9	0.3	0.5	1.0	1.5	1.5	0.9	0.9	0.5	0.8	1.4
Household appliancies	0.6	0.7	0.3	0.3	0.5	0.7	0.7	0.3	0.4	0.2	0.2	0.3
Healthcare, pharmaceutical items	0.5	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.4
Transport & Telecommunication	-3.5	-4.4	-0.5	0.5	1.8	1.3	1.3	1.3	2.4	0.8	0.4	2.5
Educational items	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	4.3	0.7	0.1	0.1
Cultural and recreation items	1.7	0.3	-0.1	-0.6	0.0	0.3	0.3	0.1	0.3	0.0	0.0	0.1
Goods and other services	1.9	0.4	0.3	0.4	1.4	1.4	1.4	0.4	0.5	0.5	0.5	1.0
Gold	3.6	-5.8	5.4	1.4	0.6	5.6	5.6	1.8	2.0	5.0	10.1	10.5
US Dollar	1.5	2.1	0.2	1.3	1.3	0.1	0.1	0.1	-0.2	-0.3	1.5	3.2

Source: GSO (2010)

TABLE 6.2B: CONSUMER PRICE INDEX BY COMMODITY GROUPS

(December 2008 = 100)

	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
General Index	100.3	99.6	99.4	99.7	100.2	100.7	101.3	101.5	102.2	102.5	103.1	104.5
Food & foodstuff	100.4	100.3	99.9	100.3	100.5	100.7	101.0	101.0	101.0	101.3	102.2	104.3
of which: Food	100.0	96.9	98.1	98.1	97.8	96.7	95.6	95.2	94.4	94.4	96.5	103.2
Foodstuff	100.6	101.5	99.9	100.4	100.7	101.4	102.1	102.0	102.1	102.6	103.3	104.2
Beverage & tobacco	101.9	102.8	103.2	103.6	104.0	104.6	105.3	105.4	106.2	106.3	106.8	107.7
Garment, hats, footwear	101.5	102.3	102.5	102.7	103.0	103.5	104.0	104.5	105.2	105.5	105.8	107.3
Housing & construction materials	100.8	95.9	96.2	96.6	97.5	98.9	100.4	101.3	102.2	102.8	103.5	103.8
Household appliancies	100.6	101.3	101.6	101.9	102.4	103.1	103.8	104.1	104.5	104.7	104.9	105.4
Healthcare, pharmaceutical items	100.5	100.8	101.0	101.3	101.5	101.7	102.0	102.2	102.4	102.5	102.6	105.2
Transport & Telecommunication	96.5	92.2	91.7	92.2	93.8	95.1	96.4	97.6	100.0	100.7	101.2	101.2
Educational items	100.1	100.2	100.3	100.4	100.4	100.5	100.6	100.7	105.1	105.8	105.9	106.0
Cultural and recreation items	101.7	101.9	101.8	101.2	101.2	101.5	101.8	101.9	102.2	102.2	102.2	103.3
Goods and other services	101.9	102.3	102.6	103.0	104.5	105.9	107.3	107.8	108.3	108.8	109.4	109.4
Gold	103.6	97.6	102.9	104.4	105.0	110.9	117.0	119.1	121.5	127.6	140.5	155.2
US Dollar	101.5	103.6	103.8	105.1	106.4	106.6	106.7	106.9	106.6	106.2	107.8	111.2

Source: GSO (2010)

Table 7.1: AGRICULTURAL PRODUCTION

(VND billion at current prices)

	2003	2004	2005	2006	2007	rev 2008	prel 2009
Gross Output	153,955	172,495	183,342	197,855	236,935	377,239	410,138
Crop Cultivation	116,066	131,552	134,755	145,808	175,007	269,338	292,997
Livestock	34,457	37,344	45,226	48,487	57,803	102,201	110,312
Services	3,433	3,599	3,362	3,560	4,125	5,700	6,830

Source : GSO (2010)

Table 7.2: AGRICULTURAL PRODUCTION

(VND billion at constant 1994 prices)

	2003	2004	2005	2006	2007	rev 2008	prel 2009
Gross Output	127,628	132,888	137,112	142,711	147,847	158,108	161,536
Crop Cultivation	101,763	106,423	107,898	111,613	115,375	123,391	124,487
Food Crops	61,029	63,621	63,853	64,186	65,194	70,125	70,198
Industrial Crops	24,175	25,612	25,586	28,422	29,580	31,638	31,921
Livestock	22,907	23,439	26,108	27,907	29,196	31,326	33,547
Services	2,958	3,027	3,107	3,191	3,276	3,391	3,502
Memorandum Items:							
Paddy Ouput (000 tons)	34,569	36,149	35,833	35,850	35,943	38,730	38,896
Cultivated Area (000 ha)	7,452	7,445	7,329	7,325	7,207	7,400	7,440
Yield (ton/ ha)	4.64	4.86	4.89	4.89	4.99	5.23	5.23

Source : GSO (2010)

Table 7.3: INDUSTRIAL CROP PRODUCTION AND YIELDS

	2003	2004	2005	2006	2007	rev 2008	est. 2009
Production (000 metric tons)							
Cotton	35	28	34	29	16	8	10
Jute	12	13	13	11	26	8	6
Sedge	96	90	81	90	99	85	76
Sugar cane	16,855	15,649	14,949	16,720	17,379	16,146	15,246
Peanut	406	469	489	463	510	530	525
Soya-beans	220	246	293	258	275	268	214
Tobacco	32	23	26	42	32	29	39
Tea - raw and fresh	449	514	570	649	706	746	799
Coffee	794	836	752	985	916	1,056	1,045
Rubber	364	419	482	555	606	660	724
Black pepper	69	73	80	79	89	98	106
Coconut	893	960	977	101	1,035	1,095	1,129
Area Cultivated (000 ha)							
Cotton	28	28	26	21	12	6	8
Jute	5	5	6	6	11	3	2
Sedge	14	13	13	12	14	12	10
Sugar cane	313	286	266	288	293	271	260
Peanut	244	264	270	247	255	255	249
Soya-beans	166	184	204	186	187	192	146
Tobacco	23	16	17	27	19	16	20
Tea	116	121	123	123	126	126	128
Coffee	510	497	497.4	497	509.3	530.9	537
Rubber	441	454	482.7	522.2	556.3	631.5	674.2
Black pepper	51	51	49.1	48.5	48.4	50	50.5
Coconut	134	133	132	134	135	138	139
Average Yield (metric ton/ ha)							
Cotton	1.3	1.0	1.3	1.4	1.3	1.4	1.3
Jute	2.6	2.6	2.3	1.7	2.3	2.4	2.9
Sedge	6.8	6.9	6.4	7.3	7.2	7.2	7.3
Sugar cane	53.8	54.7	56.1	58.0	59.2	59.6	58.6
Peanut	1.7	1.8	1.8	1.9	2.0	2.1	2.1
Soya-beans	1.3	1.3	1.4	1.4	1.5	1.4	1.5
Tobacco	1.4	1.4	1.5	1.6	1.7	1.8	1.9
Tea - raw and fresh	3.9	4.3	4.7	5.3	5.6	5.9	6.2
Coffee	1.6	1.7	1.5	2.0	1.8	2.0	1.9
Rubber	0.8	0.9	1.0	1.1	1.1	1.0	1.1
Black pepper	1.4	1.4	1.6	1.6	1.8	2.0	2.1
Coconut	6.7	7.2	7.4	0.8	7.6	7.9	8.1

Source : GSO (2010)

Table 8.1: INDUSTRIAL PRODUCTION OUTPUT

(VND billion at constant 1994 prices)

	2003	2004	2005	2006	2007	rev 2008	est. 2009
Gross Industrial Output	305,080	355,624	416,613	486,637	568,141	647,244	696,648
State sector	117,637	131,655	141,117	149,332	156,789	161,039	163,642
Central	80,917	92,896	104,372	113,666	121,388	127,249	132,451
Local	36,720	38,759	36,745	35,666	35,400	33,790	31,191
Non-state sector	78,292	95,785	120,177	151,102	188,443	225,661	248,412
Collectives	1,770	1,893	2,019	2,151	2,249	2,456	2,513
Private, households and mixed	76,522	93,892	118,158	148,950	186,194	223,205	245,900
Foreign-invested sector	109,152	128,184	155,319	186,203	222,909	260,544	284,594
Key Industries							
Coal	3,689	4,752	6,111	6,941	7,587	7,166	7,896
Oil and gas	25,132	28,403	27,410	25,466	23,817	22,175	24,064
Mining and metal ores	344	467	476	622	727	735	778
Stones and other mining	3,597	3,842	4,354	4,775	4,954	5,765	6,381
Food and beverage	64,585	74,694	84,482	103,079	121,907	141,636	149,991
Cigarettes and tobacco	9,189	10,160	11,234	11,186	12,480	12,487	11,880
Textile products	14,214	16,626	19,079	23,736	25,627	27,091	28,264
Garment - apparel	10,466	12,792	15,304	19,166	22,444	26,632	28,529
Leather tanning and processing	13,535	16,018	18,920	22,496	24,361	27,785	30,379
Wood and wood products	5,485	6,570	8,120	8,765	10,935	12,257	13,203
Paper and paper products	5,655	7,140	8,311	9,419	11,354	14,560	16,675
Printing and publishing	3,515	3,774	4,626	5,205	5,887	6,915	6,692
Chemicals	16,323	19,029	23,848	28,688	33,420	36,319	38,396
Rubber products and plastic	11,291	15,169	18,237	21,373	26,453	31,926	35,549
Non-metallic products	29,855	33,483	37,055	43,793	47,569	53,583	57,194
Metal production	10,430	11,226	13,949	15,707	18,492	21,836	24,098
Metallic products	10,646	12,963	17,595	22,836	27,972	33,438	37,047
Machinery and equipment	4,612	5,371	5,495	5,561	7,228	8,236	8,771
Computer and office equipment	1,538	1,846	3,206	5,223	6,702	8,469	9,120
Electric and electronic equipments	7,462	9,050	11,992	15,841	20,186	22,193	23,561
Radio, TV and telecom	7,162	7,956	9,137	9,138	12,462	14,081	15,404
Production & repairing motor vehicles	8,306	8,692	9,753	9,344	12,698	17,813	19,956
Production & repairing other transport means	9,676	12,172	15,834	20,712	28,274	31,707	33,732
Furnitures	7,846	10,179	13,411	18,130	21,708	24,090	25,566
Recycled products	204	261	267	321	409	534	616
Electricity and gas	18,071	20,385	23,427	26,134	29,060	32,252	36,251
Water supply	1,361	1,409	1,570	1,756	1,837	2,091	2,319

Source : GSO (2010)

Table 8.2: MAJOR INDUSTRIAL PRODUCTS

	Unit	2003	2004	2005	2006	2007	rev. 2008	est. 2009
Assembled automobiles	unit	47,701	50,954	59,152	47,576	71,892	104,750	99,301
Assembled motorbikes	1,000	1,180	1,828	1,982	2,147	2,729	2,880	2,824
Assembled tivi sets	1,000	2,188	2,660	2,515	2,446	2,928	3,107	2,937
Beverage	mil. liters	1,119	1,343	1,461	1,547	1,655	1,847	2,013
Bicycle tires	000 Pieces	26,686	26,008	20,387	22,832	24,556	24,462	25,260
Bicycle tubes	000 pieces	36,083	32,386	26,848	28,964	27,499	25,740	27,888
Bricks	mil. pieces	12,810	14,661	16,530	18,005	15,106	18,278	18,498
Cement	000 tons	24,127	26,153	30,808	32,690	37,120	40,009	47,900
Chemical fertilizers	000 tons	1,294	1,714	2,190	2,183	2,499	2,457	2,396
Cigarettes	mil. packs	3,871	4,192	4,485	3,941	4,549	4,355	4,878
Coal	mil. tons	19.3	27.3	34.1	38.8	42.5	39.8	43.7
Crude oil	mil. tons	17.7	20.1	18.5	16.8	15.9	14.9	16.3
Diesel engines	000 pieces	184.4	182.4	201.6	170.0	229.4	245.6	257.9
Electric engines	000 pieces	95.8	132.3	194.4	120.9	152.2	154.0	169.4
Electricity	mil. kWh.	40,546	46,202	52,078	57,917	64,147	70,960	80,651
Fabrics of all kinds	mil. meters	496	502	561	570	700	1,076	1,087
Glass products	000 tons	147	154	163	240	215	239	232
Insecticides	tons	40.9	54,523	45,877	53,113	59,485	65,410	78,491
Paper and paper products	000 tons	687	809	901	1,031	1,727	1,900	1,625
Porcelain	mil. pieces	524	404	514	407	396	338	271
Rice mill equipment	pieces	10,112	5,749	2,734	8,687	6,317	5,685	
Salt	000 tons	909	906	898	842	857	717	718
Sawn wood	000 m3	3,291	3,009	3,232	4,322	4,441	5,244	5,768
Soap and detergent	000 tons	377	401	421	427	409	452	524
Steel	000 tons	2,954	3,280	3,403	3,837	4,612	5,001	5,252
Sugar (refine)	000 tons	1,073	1,191	1,102	1,099	1,312	1,369	1,426
Tea	000 tons	85	122	127	124	182	208	201
Textile yans	000 tons	235	241	259	269	385	393	397
Tin (billet)	Tons	1,915	2,356	1,766	2,665	3,369	3,583	3,046
Transformers	pieces	33,364	50,146	45,540	28,149	44,681	45,044	46,800
Water pumps for agriculture	pieces	7,787	10,038	8,298	5,118	2,267	5,108	5,809

Source : GSO (2010)

NOTES

[1] Using World Bank Atlas methodology. See http://siteresources.worldbank.org/OPSMANUAL/Resources/OP310_AnnexD_July2010.pdf. Viewed 6 August 2010.

[2] EIU 2010.

[3] GSO 2008.

[4] The Gini coefficient rose from 0.34 (1993) to 0.36 (2006); see World Bank 2010f. A value of 0 implies total equality, while a value of 1 signifies total inequality.

[5] UNESCAP and CIEM 2009.

[6] MPI 2006.

[7] World Bank 2010d.

[8] GSO 2010.

[9] Cira and Karam 2010.

[10] GSO 2010. See table 2.1 in the appendix for details.

[11] The Vietnam Development Report 2010 (World Bank 2009) is also available in Vietnamese.

[12] See CECOD et al. 2010 for specifics. Water pollution is also analyzed in LBCD Consultants Inc. and Experco International Ltd. 2010 and in World Bank 2008.

[13] For good overviews, see FSPS 2009 on forests and MARD 2010 for fisheries.

[14] World Bank 2005a,b. Biodiversity is treated in its terrestrial component in the forestry chapter and in its marine component in the marine chapter.

[15] See the appendix, table 3.2 for major exports by commodity, and table 3.3 for major imports.

[16] World Commission on Environment and Development 1987.

[17] See World Bank 2006 and World Bank (forthcoming) for a detailed account of the methodology and applications to a cross-country analysis.

[18] Comparisons for 2008 are from World Bank 2010x.

[19] See Yale Center for Environmental Law & Policy and Columbia University Center for International Earth Science Information Network 2010.

[20] Except for roadside stations, concentration levels of nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead are generally stable and comply with Vietnam standards. There is limited information to assess the situation for smaller particulate matter (PM2.5), which has a critical importance in terms of health impacts, or for ozone. The 2005 ambient air quality standards were signed and due to become a technical regulation in 2009. While there is no nationally legislated air quality index system in Vietnam, Ho Chi Minh City uses an Air Quality Index based on U.S. Federal Register guidelines. Air quality monitoring systems are expected to improve as the government implements its plan to expand its Environmental Quality Monitoring Network systems as well as when the Ministry of Natural Resources and Environment (through the Center for Environmental Monitoring) completes its guidelines and handbook for air quality monitoring in Vietnam. Sources: ADB and CAI-Asia 2006; MoNRE 2008; BTNMT 2009; CAI-Asia 2010; and Dr. Tuan, Center for Environmental Monitoring, personal communication.

[21] An important indicator here is the prevalence of acute respiratory infections among children under five years of age, which is 20 percent for Vietnam. This can be compared with the following percentages: Timor-Leste (14), the Philippines (10), and Indonesia (8) (World Bank 2010g). Many factors contribute, but this indicates a potentially significant issue that would deserve discussion. To our knowledge, however, detailed analysis of the role of indoor air pollution in Vietnam is not available.

[22] See, for example, ADB 2009a, 2010; GoV 2009; ISPONRE 2009; Monash University 2010; MoNRE 2009; World Bank 2010a, 2010b, 2010c, and 2010d.

[23] The estimate assumes a 2 degree C warming. See World Bank 2010d.

[24] Monash University 2010.

[25] The term "likely" is used with reference to the IPCC (2007) assessment and indicates an estimated probability of >66 percent. IPCC notes that there is evidence of an increase in intense tropic cyclone activity in the North Atlantic since about 1970, but only "suggestions" of the same in other regions, where data quality is lower. In summary, IPCC (2007, p. 53) therefore lists "intense tropical cyclone activity increases" as "likely."

[26] The government of Vietnam adopted a program in 2008 to determine the consequences of climate change and establish national priorities. This National Target Program to Respond to Climate Change (NTP-RCC) is the country's guiding document for responding to climate change in the medium term (2009–15). See also MoNRE 2009 and UN-Viet Nam 2009.

[27] WRI 2009.

[28] SeeWorld Bank 2010b.

[29] But see, for example, the NPT-RCC.

[30] One important factor is what is assumed about CO^2-fertilization. See Nelson et al (2010) for a clear illustration.

[31] See World Bank 2010b.

[32] See Poverty-Environment Partnership 2008 for a detailed explanation and specific sources for each country.

[33] Vietnam's Law of Environment Protection 2006 requires agencies responsible for the formulation of land use plans to prepare strategic environment assessments (SEAs), at least at the interprovincial or regional levels.

[34] See Dusik and Xie 2009; Clausen et al. 2010.

[35] REDD+ stands for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries; and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries.

[36] MoNRE 2010.

[37] Here and in further in this report, the term "land management" is used in the broad meaning, including two narrower concepts of land administration (defined by FAO as the way land tenure rules are applied and made operational) and land management (i.e. how the land is used or utilized).

[38] According to the Vietnam Population Census 2009, by April 1, 2009, the country was home to 85,789,573 persons (an increase by 9.5 million since 1999). The annual population growth was 1.2 percent in the period 1999–2009, representing a decrease by 0.5 percent compared with the previous decade and the lowest annual growth rate in the last 50 years.

[39] Progress of land allocation in Vietnam (million ha).

[40] The decentralized grassroots-level process of redistribution of cooperative land to farmer households, its equitable outcomes, and the positive welfares impacts are analyzed in Ravaillion and van de Walle (2001). The land redistribution gave 15 percent higher consumption for the poorest and 20 percent lower for the richest compared with a simulated efficient allocation based on maximizing aggregate consumption. In terms of outcomes for poverty and inequality, the land reallocation was roughly the same as giving all farm households the same irrigated land equivalent.

[41] Truong Thien Thu and Perera 2010

[42] A statistical and econometric analysis of data collected through the Vietnam Household Living Standards Survey in 1992–93 shows the earlier decentralized allocation of cooperative land to farmer households had roughly the same average consumption and consumption inequality impacts as giving every household the same amount of irrigated-land equivalent. Further, efforts might take place at the grassroots level to protect the poorest and reduce overall inequality, at the expense of aggregate consumption. The analysis does not confirm the significance of non-egalitarian land allocations in case relatively well off local cadres captured the allocation process. The allocation entails an equity-efficiency trade-off and has achieved positive values of both the objectives. It also establishes that if a free-market efficiency-based land allocation had taken place instead, the outcome would have been less equitable (Ravaillion and van de Walle 2001).

[43] The granting of a Land Use Rights Certificate (LURC) signals completion of the first registration process and the formal recognition of the land user's rights, providing judicial protection of tenure security and formal land transactions. In the period 1993–2000, almost 11 million LURCs were reportedly granted to 90 percent of farmer households, making this the largest land titling program in the developing world. In comparison, only 8.7 million land titles have been distributed in Thailand since early 1980s, 1.87 million in Indonesia between 1996 and 2000, and 1.2 million in Peru by 2000 (Truong Thien Thu and Perera 2010).

	2001		2008	
	Total area	Allocated & leased	Total area	Allocated & leased
Total	32.9	24.3	33.1	24.0
Agricultural land	21.2	19.5	25.0	21.5
Ag. production land	9.4	9.4	9.4	9.3
Rice land	4.1	4.1	4.1	4.1
Forest land	11.8	10.1	14.8	11.5
Production forest	4.8	4.3	6.3	5.1
Protection & conservation	7.0	5.9	8.6	6.4
Non-agricultural land	2.0	2.0	3.4	1.6
Resid ential land	0.4	0.4	0.6	0.6
Urban	0.1	0.1	0.1	0.1
Rural	0.4	0.4	0.5	0.5
Unused land	9.7	2.8	4.7	0.9
Flat land	0.5	0.2	0.3	0.0
Mountainous & hilly land	7.4	2.4	4.0	0.9

Sources: GSO 1994 and 2009 and MoNRE report 2009

[44] For a good discussion on land degradation in developing countries, see Scherr and Yadav 1996; for specific studies in Vietnam, see Nikolic et al. 2008 and Wezel et al. 2002.

[45] For example, in Ho Chi Minh City and Hanoi, land and property prices increased by 40–50 percent in 2007 but 20 percent in 2009.

[46] LURCs are often issued for a specific government predetermined land use purpose (such as rice growing land, forestland, or residential land), a deviation from which could be classified as misuse if there were no pre-approval by concerned authorities. Upon the completion of the land use period (20 and 50 years for agricultural and forestland respectively) the tenure could be extended if respective land users have the demand and used the land according to the assigned land use purpose. There are also ceilings on land holding—for example, 2–3 hectares of agricultural land per household in the Red River Delta and 4–5 hectares in the Mekong River Delta.

[47] World Bank 2009b.

[48] Jones Lang LaSalle 2006 and 2010.

[49] Landlessness stands at more than 12 percent of the rural population and is particularly acute in the Mekong River Delta and Southern East, where both land and labor markets are more developed (Government of Vietnam 2004). Ravalion and van de Walle (2005) show that the landlessness tends to be higher among non-poor in rural Vietnam as a whole and that those non-poor engaged in land transactions tend to be better off.

[50] Ravallion and van de Walle 2005.

[51] The government fully understands the importance of the completion of the issuance of LURCs and has set the target to do that in principle by the end of 2010 (resolutions 07/2007/QH12 of the National Assembly and 02/2008/NQ-CP of the Government). MoNRE/General Department of Land Administration (GDLA) estimates, based on the currently adopted approach and methodology, that completing the issuance of LURCs and modernizing the land

administration system for all provinces would require about $850 million in 2008–15, not including $100 million under the ongoing World-Bank funded Vietnam Land Administration Project. To meet this timeline, a number of LURCs would have to be issued on the basis of existing documents and maps and updated with more accurate spatial data references later when adequate survey and mapping capacities are available. In this respect, MoNRE/GDLA was advised to consider alternative options. In this respect, the issuance of titles based on the parcel border demarcation agreed to by concerned land owners, subject to related stakeholders' proper awareness and participation used in some countries, could be useful. This approach has proved to be less costly and less time-consuming than current GDLA practice (Vietnam Land Administration Project. Second Implementation Support Mission April 1–10, 2009. Aide Memoire).

[52] World Bank. 2009b; Truong Thien Thu and Perera 2010; Davidsen 2010.

[53] Vietnam's Law of Environment Protection 2006 requires agencies responsible for the formulation of land use plans to prepare strategic environment assessment (SEA) reports, at least at the interprovincial or regional levels, as an integral content of the plan and concurrently with the formulation of the plans. The SEA shall include, among other items, the likely adverse impacts of and proposed mitigation measures for the plan's implementation. The SEAs shall be reviewed by a council established according to the level of the plans and with representatives of relevant national, regional, and provincial authorities. Organizations and individuals have the right to submit their requests and recommendations of environmental protection to the agencies that are responsible for establishing the review councils. The conclusion of the SEA review serves as a basis for final approval of the plans.

[54] World Bank 2010a.

[55] In legal acts and Vietnamese literature, customary titling is often referred to as "land allocation to communities." A community is defined by the Land Law as a group of Vietnamese who live in the same village or hamlet and have the same customs and habits or family clans (Article 9.3). Broader, in the context of Vietnam, customary titling can be understood as providing statutory long-term land use rights, taking into account long-standing principles (called as "customary law") and traditional land administration institutions that often operate outside or in parallel with the formal legal system and define how rights are ruled, allocated, and preserved within a community. Customary titling can take place in forest and "unused" land dominated by ethnic groups with largely intact traditional social structures. Currently, it is estimated that 2–2.5 million hectares of forestland are de-facto managed by communities.

[56] See Circular 38/2007/TT-BNN on forest allocation.

[57] Foerster and Apel 2004.

[58] State forest enterprises or companies manage more than 4 million hectares of forestland. Much of this is underutilized, and at least 1 million hectares could be released to local authorities for redistribution to local farmers and firms in needs (World Bank 2001). Also reportedly, most commercial land in Hanoi is still in the hands of state-owned enterprises and government bodies and often rented out to the private sector.

[59] World Bank 2009a.

[60] World Bank 2010b.

[61] World Bank 2010c.

[62] The Water Sector Review (WSR) in 2007/2008 was a joint project of the government of Vietnam and a number of international development partners. The aim was to help the government and its partners adopt better management approaches based on integrated water resources management (IWRM) principles, in line with the objectives of the National Water Resources Strategy. The immediate objective of the project was to review the state of the water sector in Vietnam and to establish a common framework to guide development decisions and support IWRM initiatives. See http://www.vnwatersector-review.com.

[63] The international standard for adequate water per person is 1,700 cubic meters a year, with the possibility remaining of having irregular or local water shortages with water availability of between 1,700 and 4,000 cubic meters a year (based on the Falkenmark Water Stress Indicators).

[64] World Bank 2007a.

[65] The Ministry of Natural Resources and Environment (MoNRE) Web site reports that in the Mekong Delta, unchecked use of bores has been causing land subsidence and pollution from damaged bores. The level of groundwater in the delta has fallen by 12–15 meters, and groundwater in several areas would be depleted by 2014.

[66] A total of 68 urban water supply companies provide service averaging 21.6 hours per day, with 55

companies supplying 18 hours per day or more. Average supply ranges between 80 and 90 liters per capita per day (lcd) to 120–130 lcd in the larger cities at a low service pressure, compared with a national design target of 120–150 lcd. Unaccounted-for water is reported as reduced to 30 percent in 2009. These official averages, however, mask unaccounted-for water values in parts of urban areas as high as 75 percent (ADB 2010a).

[67] ADB 2010a.

[68] Unimproved drinking water sources include unprotected dug wells and springs, vendors using carts, bottled water, and untreated surface water. In the dry season, water quality in most unimproved sources deteriorates markedly as quantity falls and the contaminant load rises, increasing the incidence of both water-washed and water-borne diseases (ADB 2010a).

[69] UNICEF, Country Program of Cooperation (2006–2010) between the government of Vietnam and UNICEF, the Water, Environment and Sanitation program (ADB 2010a).

[70] ADB 2010b.

[71] Ibid.

[72] Ministry of Industry 2005.

[73] Hortle 2007.

[74] Aquaculture accounts for about 17 percent of the total fisheries workforce. The area under aquaculture is nearly 1 million hectares, with a total output of over 1 million tons, over a third of all aquatic production. However, the productivity of aquaculture is low (250–300 kg/ha) compared with other countries in the region. The brackish shrimp farming area increased threefold between 1999 and 2005. Nearly 90 percent of the shrimp farming area is in the Mekong River Delta (FAO Web sites; Nguyen Van Trong 2008).

[75] Open net cage fish farms and land-based fish farms can discharge significant amounts of wastewater containing nutrients, chemicals, and pharmaceuticals. The nutrients in unused fish feed and fish feces can cause local algal blooms, or eutrophication. These blooms lead to reduced oxygen in the water, which in turn can lead to the production of ammonia, methane, and hydrogen sulfide, which are toxic to many aquatic species. Reduced oxygen can also directly kill marine life. In addition, a wide range of chemicals is currently used in the aquaculture industry, mainly pharmaceuticals such as antibiotics and anti-fouling agents such as copper. Some of these chemicals are toxic to mollusks and crustaceans (http://wwf.panda.org/about_our_earth/blue_planet/problems/aquaculture/pollution/).

[76] FAO Globefish report 2009 http://www.globefish.org/pangasius-march-2010.html.

[77] See Government of Vietnam 2010 for details.

[78] See JICA 2009 for details.

[79] JICA 2009.

[80] Government of Vietnam 2006.

[81] Ibid.

[82] ICEM 2007.

[83] ADB 2010a.

[84] The MoNRE Web site reports on the findings of a study by the National Assembly's Science, Technology and Environment Committee, which found that the cooperation among ministries, departments, and local governments in resolving inter-regional environmental problems remains less effective due to particularly overlapping regulations on the responsibility of state organizations and local governments toward environmental protection.

[85] More than 11 hydropower dams are being studied by developers for the mainstream of the Mekong. The 1995 Mekong Agreement requires that such projects be discussed among all four countries prior to any decision. That discussion, facilitated by the Mekong River Commission (MRC), will consider the full range of social, environmental, and cross-sector development impacts within the Lower Mekong Basin. So far, none of the prospective developers have reached the stage of notification and prior consultation required under the Mekong Agreement. While there will be a net economic benefit for the power sectors in all countries, the dams are also likely to have wide-ranging economic impacts that are distributed unevenly across the lower Mekong Basin communities and countries and that differ considerably in their significance between different locations and groups. The MRC is undertaking a strategic environmental assessment of the proposed mainstream dams to provide a broader understanding of the opportunities and risks of such development (MRC 2010).

[86] A range of water resource data-related issues in Vietnam were identified in detail by AusAID (2004).

[87] Financial losses, reflecting expenditure or income losses resulting from poor sanitation, are equal to roughly 0.5 percent of annual gross domestic product (GDP), while overall population welfare

losses are equal to 1.3 percent of GDP. The majority of economic losses are shared between health (34 percent), water resources (37 percent), and the environment (15 percent). The annual losses per capita equal $9.38 or VND150,770 (World Bank 2006).

[88] Currently, 170 urban water supply projects, valued at close to $1 billion, are under way, aimed at providing clean water throughout the country by 2020 (VIETWATER '10, Brochure, Vietnam Water Supply Association). The Ministry of Construction has sought approval for a $494 million project to reduce water loss (Viet Nam News 2010). Investment needs to meet the Millennium Development Goals in Vietnam in both rural and urban water and sanitation by 2020 are tentatively estimated at $600 million annually, which is roughly four times the annual investment in the last 10 years (World Bank 2006).

[89] Prior to the abolition of irrigation charges, the Irrigation and Drainage Management Companies (IDMC) collected an irrigation service fee (ISF). The aggregate total ISF revenues collected by IDMCs in 2006 was VND 659 billion and accounted for 58 percent of the aggregate total expenditures incurred by IDMCs in that year. Total revenue earned by IDMC in 2006 was VND 886 billion and covered 78 percent of the aggregate total expenditures (World Bank 2007b). While the irrigation services fee was abolished (and land taxes), farmers continue to pay irrigation fees to their water user organizations or more commonly to agricultural service cooperatives (which operate in all or most communes).

[90] IWMI, FAO, and ADB 2009.

[91] The MoNRE Web site reports that more than 3,000 violations of the Environment Law occurred during the first six months of the year, compared with 600 during the same period last year. More than 1,000 organizations and 2,000 individuals were found violating provisions of the law, and a total of VND17 billion ($895,000) in fines were issued.

[92] A total figure for the cost of water pollution is not available. However, estimates are available for a subset of the problem related to polluted water due to poor sanitation. A study (World Bank 2008) estimated the economic losses from health impacts of poor sanitation to be $262 million per year. Much of this—but not all-- is due to the impacts of polluted water. Health impacts were divided into the costs of health care, productivity losses due to morbidity, and premature death. The study indicates that sanitation accounts for nearly 7 million diarrhea cases, 2.4 million cases of scabies, helminthes, hepatitis A and trachoma and 0.9 million malnutrition-related cases per annum. These diseases also cause more than 9,000 deaths per year, mostly among children. A second major impact measured in this study is the economic costs of poor water quality that are only indirectly related to health. This study estimated these costs to be more than $287 million per year, including costs of treating polluted water used as drinking water, additional costs for finding improved water, and productivity losses in fisheries. Additional costs add up to the $780 million that has been quoted by MoNRE 2010.

[93] Vedan Vietnam is a monosodium glutamate maker. Investigations in September 2008 found Vedan had illegally dumped wastewater. Court action against Vedan is under way, per the MoNRE Web site.

[94] The impacts of climate change on precipitation and water management differ considerably between models. A run of 14 different climate models shows that Vietnam has about an equal chance of getting drier or wetter by 2050 (World Bank 2010a). The government has adopted a medium greenhouse gas emissions scenario for Vietnamese climate change projections and planning. According to this scenario, annual total rainfall will increase everywhere in Vietnam. Under the high emissions scenario, rainfall is estimated to increase by an average of 6.6 percent during this century, including by as much as 10 percent in the Red River Delta area. Should this come about, it could lead to increased risk of flooding and landslides in mountainous areas. In contrast, during the dry months, especially in the southern regions including the Mekong Delta, average rainfall could decrease by about 20 percent, leading to increased drought risks. Vietnam's "planning parameter" is a one meter rise in sea levels by 2100, which is consistent with a high emissions scenario. Without major action, such as dike reinforcements, a one meter rise in mean sea levels would cause major inundation (UNDP 2009). It is prudent to adopt planning parameters that take into account even an extreme sea level rise. For comparison, it can be noted that the Intergovernmental Panel on Climate Change (2007) projected a global mean SLR of 26-59 cm by 2100, on the basis of thermal expansion of sea water only.

[95] There are also sub-laws dealing with environmental protection charges on wastewater (Decree 67/2003), urban water supply and drainage (Decrees 117/2007, 88/2007 & 59/2007), river basin management (Decree 120/2008), and inter-reservoir operation rules (Decree 112/2008).

[96] Water rights are specified in terms of a volume or share of the water that a right-holder may take. They may also specify when and at what rate such water can be taken. Water rights include a priority of access that a right-holder has relative to other right-holders. Specifying priority of access is one means by which the year-to-year variability of water supplies is rationed between users and uses. Water rights have a specified duration. Water rights may also confer rights to construct the necessary works to extract water, to use water, and to set the timing of the delivery of that water. However, in a number of jurisdictions, separate approval processes are required to put into effect the necessary works to extract water, to use water, and to make use of the channel capacity. Finally, water rights also impose liabilities on their holders not to injure other right-holders. These liabilities are generally intended to protect third parties, such as other right-holders or the environment. Such liabilities are an important aspect of the enforcement of water rights (Australian Productivity Commission 2003).

[97] ADB 2010b.

[98] Based on EU 2000.

[99] World Bank 2006.

[100] ADB 2010a.

[101] The MoNRE Web site reports on the findings of a study by the National Assembly's Science, Technology and Environment Committee that reviewed the enforcement of environmental laws in industrial parks and urban and economic zones. The Deputy Chairman of the Science, Technology and Environment Committee, Dr. Sc. Nghiem Vu Khai, is quoted as saying that existing state policies and legal documents have laid a necessary foundation for pollution treatment and environmental protection in urban areas and industrial parks throughout the country. Nevertheless, pollution stays at a critical level in many areas, challenging economic growth and threatening people's health. This is attributed to the low enforcement of environmental laws, for which relevant state bodies and local governments must take the blame.

[102] Decision 64/2003 on handling polluting establishments and the regulatory and operational response across government is a significant achievement. But innovations are needed to improve performance. In particular, the criteria for designating an enterprise or area as "most serious polluter" are not well defined. See ICEM 2007.

[103] Eight industry groups and a number of their subsectors are consistently ranked at the top of the pollution indexes. Thus, significant improvements in environmental quality and reductions in industrial pollution could be achieved by focusing pollution control efforts on these industrial subsectors. The eight industry groups are chemicals industries, primary metals industries, food processing, leather and leather products, paper and wood products, textiles, ceramics, and non-metal mineral products industry (ICEM 2007).

[104] Various documents on the MoNRE Web site report that in the first five months of 2010, seawater had entered areas as far as 50–70 kilometers inland. About 40 percent of the rice production in that region has been affected by saltwater, and one-third of the rural population in the region does not have enough freshwater for daily activities. In some provinces, numerous canals have dried up because of the prolonged dry and hot season. Meanwhile, there is also a problem with a lack of seawater for shrimp production due to the province's policy to close the seawater supply pipeline to save more than 20,000 hectares of rice in the province. Trying to meet both the demand of rice growers for fresh water and the needs of shrimp breeders for seawater has proved difficult.

[105] Ibid.

[106] IWMI, FAO, and ADB 2009.

[107] ADB 2010a.

[108] World Bank 2006.

[109] The Quang Ngai Natural Disaster Mitigation Project is an example. The project provided and equipped a provincial Centre for Management and Mitigation of Natural Disasters and initiated and put into operation an effective community-based disaster risk management (CBDRM) approach. This demonstrated a highly successful application of complementary structural, nonstructural, and community-based components. Flood modeling convinced the authorities of the value of an integrated approach to disaster management, where previously the main provincial interest was in the structural components of projects. CBDRM also demonstrated the value of communities that have been prepared and resourced to manage the local disaster risks through preparedness, safe behaviors, adequate warning and rescue facilities, and some low-cost local structural measures. Such programs can also consider more specific aspects, such as dealing with children who have to learn to live with flooding, for example in the Mekong Delta. Safety programs such as swimming classes and flotation devices may save many young lives.

[110]ADB TA-4689 (VIE) supporting the preparation and pilot testing of guidelines to introduce benefit sharing mechanisms on hydropower projects in Vietnam, Final Report, December 2007.

[111]ADB 2010b.

ADB 2010a; The Vietnam Development Report 2010 contains a thorough treatment of governance.

[112]The Provincial Competitiveness Index is a ranking of provinces based on the competitiveness of the business environment.

[113]The National Water Resources Council is chaired by a Deputy Prime Minister and consists of all the water sector ministries.

[114]Water service operators need far greater business flexibility within a regulatory framework that protects communities, customers, and the environment. The WSR noted that, through Decree 117/2007 on clean water production, supply, and consumption and Decree 88/2007 on urban and industrial park water drainage, the government has now created the legal framework to undertake a major and on-going process of reform for the urban water sector service providers. The reforms should (based on World Bank 2006) aim to ensure the service providers have greater autonomy from government in day-to-day management and operation, are progressively commercialized, are accountable and subject to appropriate regulatory controls, have legal requirements to monitor performance against specified performance targets set by government, undertake tariff reform to improve cost recovery and financial sustainability, and are oriented to customer needs. The ADB also recommends a program to strengthen the business practices and financial basis of water supply companies (including the systematic introduction of performance indicators, benchmarking, asset inventory, management systems, and energy efficiency). The overall aim is to make water supply companies effective and financially viable (ADB 2010a). The WSR also recommended that the government consider the establishment of single body governing water and sanitation services and integrate urban water services functions to take advantage of operating and administrative synergies and economies of scale.

[116]ADB 2009.

[117]MARD Minister's Decision No. 2140/QĐ-BNN-KL, dated 9 August 2010, on the Official Data on Forest Land by 2009.

[118]MARD 2009b.

[119]MARD Decision No. 2140/QĐ-BNN-KL.

[120]Note that this chapter mostly uses the most recent data on forest cover (Decision No. 2140); however the most recent data on forest structure is drawn from the 2005 National Forest Inventory, hence inconsistencies exist in some figures (for example, area of plantations) due to the different points in time of the data sets.

[121]Data source: MARD Decision No. 2140/QĐ-BNN-KL. Summary of functional categories: Special use forest is intended for nature conservation, protection of ecosystems and of flora and fauna gene resources, and for historical, environmental, and cultural sites. Protection forest is set aside for protection of watersheds, soil and the environment. Production forest is the source of wood and non-wood forest products and is also meant to contribute to ecological protection.

[122]Phan Nguyen Hong and Hoang Thi San 1993; MARD Decision No. 1267/QĐ-BNN-KL, dated 4 May 2009 Announcing the Current Forest Resource Management of the Country (for area of mangroves in 2008).

[123]The widely used terms "barren" or "bare" hills are a misnomer as most are covered by a dense scrubby cover of both woody plants and grasses (McElwee 2009).

[124]Afforestation programs included: Program 327 in 1992, Program 556 in 1996, and Program 661 in 1998.

[125]MARD Decision No. 2140/QĐ-BNN-KL.

[126]MoNRE 2009.

[127]Government of Vietnam 2001.

[128]Prime Minister Decision No. 18/2007/QD-ttg, 5 February 2007, on Approval of the Vietnam Forestry Development Strategy 2006–2020. VFDS "Development" Programs: I. Program on Sustainable Forest Management and Development; II. Program on Forest Protection, Biodiversity Conservation, and Environmental Services Development; III. Program on Forest Products Processing and Trade. VFDS "Support" Programs: IV. Program on Research, Education, Training, and Forestry Extension; V. Program on Renovating the Forest Sector Institutions, Policy, Planning, and Monitoring.

[129]World Bank 2009.

[130]Prime Minister Decision No. 661/ QD-TTg, 29 July 1998, on Objectives, Tasks, Policies and Organisation for the Implementation of Reforestation of Five Million Hectare Program.

[131]The main targets were to establish 5 million hectares of forest (3 million hectares of protection forest and 2 million of production forest) through a series of cash incentives (protection forest) and preferential loans (production forest).

[132]Van der Poel 2007.

[133]World Bank 2010b.

[134]Prime Minister Decision No: 100/QD-TTg, 6 July 2007, on Revision and Amendment of Some Articles of the Decision 661/QD-TTg (the 5 Million Hectares Reforestation Program); the main revisions included: revision of targets, reclassification of forests to reduce protection forests and increase the area of production forests, and finalization of land allocation and lease.

[135]Prime Minister Decision No. 147/2007/QD-TTg, 10/9/2007, on Production Forest Development Policy for the period of 2007–2015.

[136]For example, current forest policies remain rather centralized, with often overly complex and detailed regulations hampering application in the field (Wode and Bao Huy 2009); lower levels remain upwardly accountable, hindering innovation and efficiency gains that subsidiarity offers, and administrative and service provision capacity for the forest sector at district and commune levels is limited; the state retains direct control of most of forests—continuing to manage most of the SUFs (85 percent) and protection forests (70 percent) (Nguyen Ba Ngai 2007); and many aspects of central control persist, for example in the form of harvesting quotas and land-use options - household land-use decision making is mostly driven by command-and-control measures, much less so by economic incentives (Wunder et al. 2005).

[137]According to Nguyen Ba Ngai et al. (2009), adequate coordination among ministries for an integrated data compilation system does not exist, no consistent time-series data compilation has been done, and in some instances data are simply not available. Also, according to Muller et al. (2006) the accuracy of forest data ranges from 65 to 95 percent, depending on factors like the method of data collection and compilation, the complexity of topography, and the homogeneity of forests.

[138]World Bank 2009.

[139]Extrapolation based on value per hectare of timber and of forest environmental services for different forest types derived by ADB (2009) and on forest area from FIPI in 2005 (http://www.fipi.vn/solieu_ck3/SolieuCK3.htm). Environmental service values: $29,731 million, consisting of soil protection at $1,822 million, water regulation at $3,545 million, carbon sequestration at $24,364 million, and timber value at $10,757 million.

[140]ADB 2009.

[141]World Bank 2009.

[142]In Vietnam the mean annual increment of fast-growing species under the right conditions is some 26 cubic meters per hectare (ADB 2001; Fraser 2003; Katila 2007).

[143]Local people lack capital, production experiences, techniques, and information on markets and are therefore unable to carry out effective production on allocated land (Vietnam Forestry University 2005); Swan 2010.

[144]For example: CO2OL Biodiversity Reforestation (http://www.co2ol.de/CO2OL-Biodiversity.195.0.html?&L=1).

[145]GoV 2010a.

[146]In 2007 Vietnam was the tenth largest exporter of secondary processed wood products by value (ITTO 2009); it may well be ranked sixth in 2010.

[147]Vietnam News 2009.

[148]This is consistent with the MARD (2009c) finding from some enterprises that financial effectiveness was low.

[149]Ogle and Donnelly 2004.

[150]Karsentry 2006.

[151]World Bank 2009.

[152]MARD 2009c. In recent years Malaysia has been the largest supplier of wood products, followed by the United States, China, Lao PDR, Cambodia, and Thailand.

[153]According to Nguyen Ba Ngai (2007), appropriate plantation sites—close to consumption markets—are either already allocated or unallocated but consisting of poor sites in scattered locations. Large and centralized areas are located in remote and mountainous regions, where transportation conditions are difficult and far from markets.

[154]FAO 2009.

[155]Vietnam News 2009.

[156]FSC 2010.

[157]FSC chain-of-custody certification verifies that products from forests certified as meeting the standards set by the FSC for responsible forest

management are not mixed with products from uncertified forests at any point in the supply chain.

[158]EIA and Telapak 2008; Forest Trends 2009; World Bank 2010.

[159]SeeWorld Bank (2010) for a discussion of the malpractice that enable the illegal timber trade to continue and flourish.

[160]Nguyen Ba Ngai et al. 2009.

[161]Sunderlin et al. (2008) showed that slightly over 70 percent of districts that contained high forest cover also had a high rate of poverty.

[162]Tran Kim Long 2008; Sunderlin and Huynh Thu Ba 2005; Nguyen Quang Tan et al. 2008.

[163]Vietnam Forestry University 2005; Swinkels and Turk 2006.

[164]The Forest Protection and Development Law of 1991 provided for the involvement of different actors in forest management; the Land Law of 1993 recognized the rights to lease, exchange, inherit, mortgage, and transfer land-use titles; the revised Land Law of 2003 recognized the legal status of communities in land tenure; and the revised Forest Protection and Development Law of 2004 recognized legal status of communities in forest tenure.

[165]Nguyen Quang Tan et al. 2008.

[166]Katila 2008.

[167]These shortcomings have been well documented: slow and poor forest land use planning (MARD 2009b); inequitable allocation—Kinh migrants and prominent ethnic minorities living in district towns and commune centres were better positioned to benefit from land allocation programs in contrast to the poorer ethnic communities living in more remote areas (Humphreys and Vu Thi Hien 2008); elite capture—overallocation for mass organizations, employees of SFEs, and well-off individuals (Sunderlin and Huynh Thu Ba 2005; Nguyen Quang Tan et al. 2008; World Bank 2009); undemocratic and non-transparent land allocation decisions (MARD 2009a); inadequate collaboration between forestry and land administration agencies (MARD 2009b); shortcomings in benefit sharing arrangements, investment support, and technical assistance (MARD 2009b); and unclear rights and awareness of opportunities among recipients (Vietnam Forestry University 2005; Nguyen Quang Tan et al. 2008; MARD 2009b).

[168]Swinkels and Turk 2006.

[169]Humphreys and Vu Thi Hien (2008) refer to ethnic minorities in the Northern Highlands lacking "political capital"—the capacity to effectively use "voice" to influence decisions in social and political arenas and, related to this, the lack of local institutions through which their voices can be heard and information shared.

[170]According to Vu Thi Hien, Centre of Research & Development in Upland Area (personal information, August 2010): During a recent consultation workshop on REDD+, representatives of local authorities and local people from 10 provinces in the north of Vietnam agreed that local people have poor access to the policy and that dissemination of policies on forest and forestland to local people is limited (laws and policies just arrive at the commune level and not much information is going to households, even some commune officers do not fully know the policies and laws).

[171]Data for 2009 show that out of the total of 13 million ha of forest, about one third are being used and managed by non-state economic sectors (households approximately 3 million ha; local communities 0.2 million ha; the armed forces 0.2 million ha; and joint-ventures and other entities 0.8 million ha), and two thirds are being used by state entities (state owned enterprises 2 million ha; protection forest management committee 2.3 million ha; special use management committee almost 2 million ha; and people's committees 2.4 million ha). Source: MARD's statement of forest status in 2009, as of 31 December 2009, as per Dr. Ngai, personal communication, September 6, 2010.

[172]According to MARD (2009c) data, the area of forest allocated to communities was 181,226 ha by end of 2007, most of which was poor and young forests.

[173]The full explanation of REDD+ reads: Reducing Emissions from Deforestation and Forest Degradation in Developing Countries; and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries" (REDD+).

[174]In particular the UN-REDD Programme, based on experience built up by GTZ-sponsored projects in Dak Lak, Dak Nong, and Son La provinces.

[175]World Bank 2010.

[176]Taking the corporate form or a one member Limited Liability Company (with state as the sole member/owner) or a Joint Stock Company with the possibility of shareholding by employees and others (as well as the state)

[177]World Bank 2009.

[178]WCMC 1992. Vietnam contains all or part of five Endemic Bird Areas as defined by BirdLife International and that the entire country is part of the Indo-Burma Biodiversity Hotspot, whose biological richness is fully detailed in CEPF (2007). These are both important and authoritative indicators of biological richness.

[179]New scientific discoveries included 222 species of plants between 1992 and 2002, and four species of large mammals between 1992 and 2005 (World Bank 2005).

[180]Nguyen Hoang Nghia 2004.

[181]See World Bank 2010a for details.

[182]Dang Huy Huynh 2005.

[183]In categories Endangered, Vulnerable, Rare, and Threatened, following the Red Data book of Vietnam (MoSTE 1996; MoNRE 2007).

[184]In categories Critically Endangered, Endangered, and Vulnerable following IUCN Red List of Threatened Species (www.redlist.org).

[185]MoNRE 2009.

[186]Includes 30 National Parks, 48 Nature Reserves, 12 protected areas and species habitat, and 38 protected landscape areas, with a total area of 2.06 million hectares, accounting for 6.25 percent of physical area of the whole country.

[187]Jonathan Eames, BirdLife International, personal information, July 2010.

[188]ICEM 2003a.

[189]A review of national experience with protected areas and development in Vietnam (ICEM 2003b) found that despite achievements, most protected areas remain "paper parks," with little conservation management taking place on the ground. See also Polet et al (2006) with respect to PA reform.

[190]Emerton et al. (2006) refer to problems of long delays and frequent readjustments in public sector budgeting procedures, recurrent budgets that allow for little more than salaries, and capital expenditure that mostly focuses on heavy infrastructure, with little funding for conservation activities.

[191]For example, ranger stations are managed by the province rather than the SUF.

[192]Between SUFs, FPD, police, environment police, border army, customs, and other relevant institutions.

[193]Wunder et al. (2005) contend that payments in forest protection contracts from the state to households typically make up 1–2% of total household income (with a few exceptions). Even if the landowner had property rights and a significant degree of land use choice, the amount offered would normally be insufficient to fully "compensate" the opportunity costs for foregone alternative uses.

[194]MoNRE 2009; McNally 2010.

[195]FoE 2001.

[196]Examples given by McNally (2010) include the following: Hydropower developments: ADB (2009) carried out a Strategic Environmental Assessment of the Hydropower Master Plan in the context of the Power Development Plan VI. This examined the likely impacts of 21 large-scale dams (with a capacity over 4,610 MW) that are planned. It was estimated that the land area lost would be around 21,133 ha (including 4,227 ha of natural forests and 1,367 ha of plantations). The total resource value of the forest lost (including environmental service functions) was estimated to be $72.4 million. Agricultural expansion: Current and future polices and plans for the expansion of agriculture (in particular, rubber) point to a large-scale expansion of rubber and to a lesser extent cashew, as highlighted in the first draft of the MARD Five Year Plan of 2011–2015 as well as in Prime Minister's Decision 750/2009/QĐ-TTg dated 3 June 2009 (on Approving the planning on development of rubber tree up to 2015, with a vision toward 2020), which provides for the development of up to 100,000 ha of new rubber plantations in the Central Highlands on unused land and through clearance of poor natural forest.

[197]For example, controls to restrict the import of illegal timber in the United States (Lacey Act) and the European Union (EU FLEGT Action Plan and EU Due Diligence Regulation).

[198]Various studies have shown that the level of incentive required for a farmer to protect and develop forests varies, depending on options, circumstances, and nature of the incentive. A study by Bui Dung The and Hong Bich Ngoc (2006) found that in areas where there is underemployment and where much paid work is seasonal, resource-poor farmers with limited options to earn money from the land they work were willing to participate in a pilot payment for environmental services (PES) scheme where the average payment that households received was approximately VND 230,000 ($15) per year for protection of an area averaging 1.5 ha. Similar findings were made from recent PFES piloting where the payment of VND 270,000 ($15) per hectare per year under the scheme, compared with VND 100,000 ($5) under Programme 661,

resulted in increases in forest patrolling and a 50 percent decrease in the number of reported violations (UN REDD 2010; Peters et Al. 2009). However, Phuc Xuan To of Forest Trends contends that a farmer can earn $400 per year with one hectare of corn; with PES, however, he'll get about $20, and that's not enough to stop deforestation (Phuc Xuan To, Forest Trends, 2010: http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=7605&section=news_articles&eod=1). In contrast, Wunder et Al. (2005) found that higher payment levels for reforestation and tending newly planted forest (up to VND 2.5 million per hectare or $160) seemed to be working well, both because they made a real difference to household livelihoods and because they were coupled with technical assistance.

[199]Tim Boyle, UNDP, personal information, August 2010.

[200]VINAFOR provides low-interest loans to households together with guidance for planting; the contract defines the price (in line with the market price at time of sale) and quantity to be sold to VINAFOR, leaving farmers free to use or sell any surplus.

[201]Lam Son Sugar Joint Stock Corporation jointly owned by the Vietnam government (37.5 percent), employees (32.4 percent), and its farmer suppliers (22.5 percent) (balance uncertain).

[202]Katila's (2007) analysis of demand and supply scenarios for the Vietnamese forest sector rejected a "self-sufficiency" scenario because it is unfeasible from an investment viewpoint (there would not be enough funds for expanding the plantations and industry); because there would not be enough quality land available for plantation expansion; and because it would have negative impacts on the national economy and would not be economically a sustainable option in the long-term, because Vietnam would be producing on a large scale many products in which it does not enjoy a comparative advantage.

[203]The separation of public and private functions and transformation of remaining SFEs into autonomous, commercially viable businesses based on sustainable forest management.

[204]MARD 2009c.

[205]This chapter focuses largely on marine fisheries, given the sector's role as the largest driver of change in marine ecosystems and marine-based economies. Aquaculture is given wider consideration in the chapter on water resources, as is the general issue of coastal zone management.

[206]This list includes coral reefs, sea grasses, mangroves, inland marshes, estuaries, coastal lagoons, dunes, and beaches.

[207]Per capita fish consumption in Vietnam has increased 2 kilograms over the last two General Statistics Office (GSO) Vietnam Household Living Standard Surveys (VHLSS) 2006-2008.

[208]GSO 2009.

[209]See Ministry of Fisheries and World Bank 2005, p. 3; Nguyen Thi Dieu Thuy and Symington 2008, p. 2; Pomeroy et al. 2009, p. 1.

[210]This figure is from 2008 when fuel subsidies were offered to all registered vessel owners as a response to increases in oil price increases, resulting in heightened registration efforts. A final number of 130,000 was the total qualifying for fuel assistance. However, many vessels can be assumed to have not registered and remain "off the books" but operational (including the numerous non-motorized "coracle" boats used in artisanal fisheries, which has been estimated at 30,000 or more).

[211]Pomeroy et al. 2009, p. 2.

[212]Key instruments include Decision No.358-TTg dated 29 May 1997 on preferential taxation on the exploitation of marine products in offshore areas, Decision No. 393-TTg of 9 Jul 1997 containing regulations on investment capital control and utilization, and Decision No. 251/ 1998/ QD-TTg of 25 Dec 1998 on the approval of the marine product export program to the year 2005. These policies generally supported preferential loans to offshore fishers to upgrade their vessel capacity and install modern equipment and efficient fishing gear. Private businesses (including foreign-invested businesses) exploiting the offshore fisheries were given reduced tax reductions during the first three years of business.

[213]See VIFEP and WWF Vietnam 2009.

[214]There are no vessel quotas or closed seasons. Under Vietnam's "open access" system, vessels from different provinces are permitted to fish in any area of the country provided the depth is greater than 30 meters (classified as the "offshore" area). Areas under 30 meters depth are generally meant to have priority for home province vessels for inshore fishing. However, strong competition between neighboring provinces and even local communities, combined with illegal vessels and poor enforcement, means that vessels are routinely found outside of their restricted zones.

[215]According to Hassan et al. (2001) and Dang Van Thi

et al. (2002), trawl surveys of demersal fish estimated 1.1 tons of biomass per square kilometer (compared with 2.8 tons in the mid-1990s) as well as dramatic shifts in catch composition plus low numbers of formerly abundant, large long-lived fish species. According to Nguyen Chu Hoi (2003) and Nguyen Thi Dieu Thuy and Symington (2008), average fish densities have greatly reduced, and several common economically valued fish species, such as sardine, lobster, abalone, scallops, and squid, have significantly decreased in abundance.

[216]According to 2008 MoLISA data, the rate of poverty in coastal versus non-coastal provinces is almost the same, but this average hides some interprovincial differences. Provinces such as Thanh Hoa and Nghe An have high poverty rates and absolute numbers of poor people, offset by wealthier provinces such as Khanh Hoa and Long An. In addition, some of the coastal provinces do in fact have very high rates of poverty. The issue is that there are likely great disparities in poverty rates within coastal provinces, or even within district/communes. See also Nguyen Thi Dieu Thuy and Symington (2008).

[217]At the time of writing, detailed and reliable data on profitability were not available. Based on published reports, included those referenced in this chapter, there are strong indications that the fisheries resource is strained and that profitability is declining, particularly for inshore fisheries. Other indicative data—for example, the large number of boats that remained onshore during spikes in fuel prices (until the government started to subsidizes)—suggest very small operating margins. This makes job diversification schemes more attractive, particularly for small-scale fisheries, and reinforces the need for good information, which requires attention and investment.

[218]Decision No. 10/2006/QD-TTg2006.

[219]See Morgan et al. 2007.

[220]On 29 September 2008, the Council of the European Union adopted EC No. 1005/2008 establishing a "community system to prevent, deter and eliminate illegal, unreported and unregulated fishing." The regulations were set to come into effect on 1 January 2010. Under the Illegal, Unreported, and Unregulated (IUU) Regulation, the importation of fishery products into the European Community will be allowed only when the import is accompanied by a catch certificate, completed by the master of the fishing vessel and validated by the flag state of the vessel.

[221]The new legislation had immediate negative impacts for fisheries in Vietnam. Tuna sales dropped 20 percent in early 2010 from postponed shipments and a decrease in contracts for export to the European Union. However, the new IUU regulations provided an opportunity for Vietnam to accelerate progress in meeting international standards on catch documentation and addressing IUU, and they contributed to the government's decision to enter the Western and Central Pacific Fisheries Commission, initially as a Co-operating Non-member (see http://english.vietnamnet.vn/biz/201001/Seafood-prices-drop-under-IUU-effects-889404/).

[222]Harvest targets are set by provincially led development plans that emphasize economic growth targets. Even with better data, estimates of maximum economic and sustainable yield may have little bearing on harvest levels and controls on fishing unless agreements are reached at a higher level and unless local enforcement follows.

[223]See Tietenberg 2008.

[224]Nguyen Thi Dieu Thuy and Symington (2008) report several characteristics of vulnerability in Vietnamese fishing communities, including dependence on depleting resources, lack of capital and/or credit to invest in new gears or occupations, increased disparity between poorer and wealthier fishing households, low levels of income stability, decreased competitiveness of local fishers compared with those from "outside" with better gear, poor access to markets and/or new technologies, and socioeconomic indicators below national targets or averages (particularly average household income, poverty rates, and education).

[225]The intermediary system in Vietnam, while much maligned, provides an essential service in that most small-scale fisheries would not operate without the financial support of the traders. The negative aspects of this system (for example, limiting the ability of individual fishers to gain access to markets directly and/or adjust their activities according to market conditions) will only improve if fishers start to organize into producer groups and become more engaged in value chains and markets.

[226]See Nguyen Thi Dieu Thuy and Symington 2008.

[227]Decree No. 79/2003/ND-CP of July 7, 2003,

[228]According to Nasuchon (2009), Vietnam's coastal population is projected to increase to over 30 million by 2020 (from around 20 million in 2000). The coastal population density was approximately 255 persons per square kilometer in 2005 (compared with the overall population density of 246 persons per square kilometer). Creel (2003) estimated that approximately

1,000 people migrate to Vietnam's coastal cities each day.

[229]Coastal tourism in Vietnam is growing rapidly (see http://www.nea.gov.vn/html/Baocao_hientrang/VN_SoE/overview/environmental_management_and_legislation.htm).

[230]See Burke et al. 2003.

[231]See the VDR Forest Management chapter for further discussion on mangroves.

[232]See Pollnaca et al. 2005.

[233]The realistic scope for alternatives will vary substantially along the coast, depending upon the parallel development of tourism, manufacturing, aquaculture, mariculture, etc.

[234]Farming of such low trophic species tends to require relatively less fishmeal feed (therefore not driving overfishing of "trash fish" industries nor likely contributing to an overall net loss of seafood protein, as is typified in the culture of higher trophic species) and also far fewer chemical inputs compared with higher trophic species.

[235]Under the project "Integrated Management of Lagoon Activities," funded by the Italian government, with technical execution by the Food and Agriculture Organization.

[236]See http://czm-soctrang.org.vn/Publications/EN/WCD/5.%20Steven%20Swan%20Co-management%20VN%20experiences%20EN.pdf.

[237]See Pomeroy and Guieb 2008.

[238]Under German Technical Cooperation support.

[239]See Schmitt 2009.

[240]See http://www.mrcmekong.org/Catch-Culture/vol15_1May09/clams-and-cockles.htm.

[241]See http://www.msc.org/track-a-fishery/certified/pacific/vietnam-ben-tre-clam-hand-gathered/assessment-downloads-1/12.10.2009-Ben-Tre-Clam-Fishery-Final-Report.pdf.

[242]For example, circle hooks and turtle de-hookers in longline fisheries and use of bycatch reduction devices in trawl fisheries.

[243]Sumaila and Pauly 2006; VIFEP and WWF Vietnam 2009.

[244]See VIFEP and WWF 2009. Studies indicate that fisheries subsidies in Vietnam have in many cases qualitatively affected overfishing, both directly and indirectly. Triggered initially by the economic reforms of "Doi Moi" which sought to expand access to world markets, subsidies for fuel and vessel upgrading have particularly contributed to overcapacity. Vietnam fisheries subsidies up until 2006 totaled $316,633,000, with only $48,537,000 classified as "good" subsidies. "Good" subsidies are associated with programs leading to investment in natural capital assets to a social optimum—that is, maximizing economic rent. Alternatively, "bad" subsidies include all forms of capital inputs and infrastructure investments from public sources that reduce cost or enhance revenue. (It should be noted that the subsidization of fishing is also pursued as a means to maintain at-sea presence and border security).

[245]http://en.www.info.vn/science/152-environment/4648-460-bln-vnd-earmarked-for-marine-reserves.

[246]Including likelihood of local stakeholder support and feasibility for co-management in addition to the MPA's potential to provide positive benefits for marine biodiversity.

[247]The NOAA-WWF-IUCN marine protected area (MPA) guidebook "How is Your MPA Doing?" (http://www.wdpa.org/ME/PDF/HowMPA.pdf) has been translated into Vietnamese and applied at some MPA sites, though not yet in a systematic manner across the entire network.

[248]"Reef resilience" refers to coral reefs that are able to recover after experiencing a stressful event such as bleaching caused by elevated temperatures. Through careful planning, MPAs can be designed and zoned in ways that protect coral communities that are more likely to remain relatively unchanged in the face of a major disturbance or event such as bleaching. See http://www.reefresilience.org/Intro_to_Resilience.html.

[249]The use of circle hooks in replacement of traditional "J hooks" in longline fisheries has been proved regionally to reduce the mortality of sea turtles by as much as 80 percent, while not negatively affecting target (tuna) catch rates.

[250]Vietnam's longline Observer Program was launched in 2007 by the Ministry of Agriculture and Rural Development and WWF Vietnam, with an initial coverage of 10 longline vessels deploying onboard observers and incorporating circle hook trials in selected vessels. The program has provided a new and important opportunity to collect basic fisheries data (such as catch rates and species composition), as well as encouraging the adoption of circle hooks as a means of reducing bycatch. The program is now being linked to efforts aimed at providing market-based incentives (such as price premiums and preferential sourcing) for tuna vessels using circle

hooks and/or observers. See http://wwf.panda.org/who_we_are/wwf_offices/vietnam/?185281/Fisheries-Bycatch-Reduction-Program-Catches-On.

[251]The Democratic Republic of Congo is an example of a nation rich in mineral resources that has failed over many years to translate this natural resource endowment into sustainable development. Chile or Botswana have used their mineral wealth wisely and have derived significant development impacts and outcomes.

[252]Ministry of Natural Resources and Environment-Vietnam Mining Presentation by dated 15 Oct 2008 in Regional Mining Seminar in Singapore. Oil and coal contribute more than 90 percent of the production output of the MQI sector annually in Vietnam.

[253]Vietnam Statistical Yearbook, 2009.

[254]World Bank staff estimates, 2009.

[255]It is important to note that many issues related to mining and minerals development in Vietnam are not discussed in this chapter: the role of state, particularly state-owned companies; small-scale and artisanal mining; investment promotion and negotiations with large companies; competitive position of Vietnamese minerals internationally; infrastructure considerations for minerals development; detailed considerations in terms of mining taxation and fiscal policies as well as tax administration; and overarching issues such the implications of the climate change agenda and global warming on development of Vietnam's minerals.

[256]MoNRE "Report summarizing the 13 years of Implementation of Mineral Law 1996", 2009 from MONRE submitted to NA. MOIT "Report on exported minerals, 2007."

[257]Mining Working Group of Companies, Vietnam Business Forum, Position Paper dated 1 December 2009.

[258]Recommendation from: Workshop Report: Mineral Development and Sustainable Development, Hanoi, May 2010.

[259]An example is ilmenite exploited in central coast of Vietnam. Most companies export ilmenite (46 percent Ti2O3), which is the lowest level of processing in the titanium processing chain.

[260]A total of 128 separate legal documents (laws, ordinances, decrees, decisions, directives, and circulars) have been promulgated to regulate the mining industry in Vietnam. Separately, an additional 26 legal documents have been prepared by government agencies and submitted to higher authorities for adoption and promulgation.

[261]The Investment Law 2005 is the merger of the Foreign Investment Law 1987 (amended in 1992, 1996, 2000) and the Law on Private investment Promotion 1996.

[262]Source: Sustainable Development Impacts of Investment Incentive: A Case Study for the Mining Industry in Vietnam.

[263]Decree 27 December 2005 and Prime Minster letter 11 April 2006.

[264]Wuhan, "Local permit widespread", at Public Security Police Online, at http://www.cand.com.vn/vi-VN/kinhte/2010/7/133523.cand dated 08 July 2010.

[265]The government has also pursued an active program to disseminate various documents and legal texts to the general public and to conduct sensitization campaigns on the rules and regulations of the minerals law. Since 2006 MoNRE has dedicated a Web site and on-line training sessions on the minerals legislation.

[266]MoNRE's various departments are geology, mining, finance, and international cooperation.

[267]Other state enterprises in the heavy industries include the Vietnam National Cement Corporation, the Vietnam Chemical Corporation, and the Vietnam National Steel Corporation.

[268]Decree No. 80/2006/ND - CP dated 9/8/2006 of the Government of the Socialist Republic of Vietnam on detailing the implementation of some articles of the 2005 Law on Environmental Protection; Decree No. 21/ 2008/ ND- CP dated February 28, 2008 of the Government concerning partial changes in some articles stipulated in Decree No. 80/ 2006/ ND- CP dated 9/ 8/ 2006; Circular No. 05/2008/TT - BTNMT dated 08/12/2008 of the Ministry of Natural Resources and Environment concerning guidelines for assessment of strategic environment and environmental impacts and commitment to environmental protection; Decision No. 13/2006/QD- BTNMT dated 08/9/2006 of the Minister of Natural Resources and Environment concerning issuance of Regulations on Organization and Operation of an Appraisal Council.

[269]Environmental Department, MoNRE.

[270]Normative regulations concerning, for instance, erosion, sedimentation, and ecological diversity.

[271]Interview with Director of Environmental Assessments, MoNRE, May 2010.

[272]Bui Quang Binh, "Mining areas of environmental research," at http://www.tuanvietnam.net/2010-06-11-cuu-moi-truong-vung-khai-khoang, 22 May 2009.

[273]Source: Vinacomin. Estimate based on a stripping ratio (the amount of sterile material to be excavated to produce 1 ton of coal) of 7.5 tons.

[274]Report on the Research project of PhD Dao Danh Phuong, Nguyen The hung, Nguyen The Bau, Doan Van Hai, Mine Science and Technology Journal No. 1/2009.

[275]Report on the Research project of PhD Dao Danh Phuong, Nguyen The hung, Nguyen The Bau, Doan Van Hai, Mine Science and Technology Journal No. 1/2009.

[276]Decree 63/2008/ND_CP dated 13 May 2008.

[277]Vinacomin reports, 2009.

[278]World Bank Community Development Agreements Project, COCPO, 2010.

[279]Vu Xuan Nguyet Hong (CIEM) and Nguyen Thi Lan (ILSSA), "Economic Governance and Policy-Making Process in Vietnam", June 2010; Decree 63/2008/ND_CP dated 13 May 2008 on environmental Protection fee applicable to mineral mining

[280]See: www.eiti.org.

[281]The German classification nomenclature is used in tandem with the English nomenclature, as this is frequently used in Vietnamese documents. Coals are classified by content of volatile matter expressed as a percentage by weight. Thus, lignite contains 45–65 percent volatiles; anthracite 7–12 percent volatiles. This correlates reversely to the calorific value, expressed as kilojoules per kilogram: lignite 28,470 and anthracite 35,300.

[282]Thai Nguyen, Hai Duong, Bac Giang, Son La, Quang Nam, Quang Ninh, Nghe An, Lang Son, and several areas such as U Minh Thuong, U Minh Ha, and Red River Delta.

[283]Nguyen Thanh Ha, Invert the structure of coal consumption from in 2010, on Trade Magazine dated 10 Jan 2010 at http://tintuc.xalo.vn/00-941362442/dao_nguoc_co_cau_tieu_thu_than_tu_nam_2010.html and Report on Production volume of Department of Distribution, Vinacomin, 2008-2009.

[284]Source: Vu Xuan Nguyet Hong (CIEM); Investment from 2005 to 2009: VND 4,100 billion to 33,100 billion; owner's capital from VND 5,546 billion to 19,583 billion; before tax profit: 2005 = 3,130 billion, 2010 = 3,200 billion. Profit to capital ratio has decreased four times over this period.

[285]Lao dong newspaper, The fight against illegal coal in Quang Ninh, what does the coal industry say?, No.93 dated 25/04/2008.

[286]In 2009, the minimum wage in Vietnam is 0.65 million VND/month whereas the average salary for Vinacomin employees is 6.16 million VND/month. Source: Department of Labor and Salary of Vinacomin and Statistical Yearbook over the years.

[287]Forecast of human resources demand for coal industry by Department of Labor and Salary of Vinacomin, 2010.

[288]See: Vinacomin, Mine Science and Technology Institute, monitoring project 2008.

[289]Dao Danh Phuong, Nguyen The hung, Nguyen The Bau, Doan Van Hai, Mine Science and Technology Journal, No. 1/2009.