

ENVIRONMENT ASSESSMENT (SUMMARY)

I. Key Environment and Natural Resources

1. Myanmar is well endowed with natural resources on which economic development and people's livelihoods are largely dependent. Despite the low levels of industrialization and the relatively low population density, the country's environment is under threat from both human activities and climate change. Natural resources and environment status and trends as documented in Myanmar's current National Environmental Performance Report 2007-2010 prepared under ADB's GMS CEP-BCI¹ are summarized hereinafter.

2. While Myanmar's **forest** cover is comparatively higher than other Greater Mekong Subregion (GMS) countries, there has been a steady decline in forest cover and quality. At present, nearly half of the country remains covered with natural forests, with total forest in 2006 corresponding to approximately 49% of country land area. Natural forest loss has averaged 392,540 hectares annually since 1989, representing a major acceleration in forest cover loss compared with the prevailing situation.

3. Unsustainable extraction represents a key pressure on forests. While the Government has long practiced sustainable forest management, available data show that commercial logging operations have consistently exceeded annual allowable cut. Illegal logging occurring in remote and difficult-to-monitor area, conversion of forest to agriculture, commercial agriculture, and extraction of fuel wood represent additional pressures on forests. Fuel wood extraction, constituting around 92% of total wood removal in 2000, is significant compared to round-wood removals, with more than 80% of total primary energy in Myanmar still being supplied by fuel wood.

4. The Government has responded to deforestation mainly through the establishment of forest reserves, setting a policy target of 30% of the total land area. Starting from a base of 15% in 1985, protected forest increased to approximately 26% in 2006. Expenditure on forest conservation also increased in response to the threat of forest depletion, with annual expenditure soaring almost 90 times in nominal terms over the period 1988-2007. Forest plantations received approximately 27% of the total annual budget in 2007 compared to more minimal expenditure on other forest management activities (e.g., natural regeneration expenditure and forestry research and forestry training expenditure in 2007 was only 1.87% and 1.79%, respectively). Forest management has been further strengthened through adoption of sound policy and institutional measures. A 30-year forestry master plan formulated in 2002 addressed principle shortcomings in forest management and gave greater attention to elements such as forestry extension, community forestry, agro-forestry, fuel wood energy savings, and human resource development.

5. **Land degradation** is an increasing problem in Myanmar, with soil erosion in upland agricultural areas and dry zones being of particular concern. Vulnerable farming area as a percentage of the country's total cultivated area was estimated at 33% in 2008. Natural processes in vulnerable farming areas are aggravated by human interventions such as excessive forest harvesting, mono-cropping practices and shifting cultivation. Growth in the upland human population is a key pressure, being closely correlated with land degradation and land productivity changes. From 1980 to 2008, upland population increased by 7 million, reaching 17.5 million people, or accounting about 30% of the national population.

¹ RETA 6289 – GMS: Core Environment Program and Biodiversity Conservation Corridors Initiative

6. The Government is responding to land degradation in part through promoting various conservation and land rehabilitation programs. Targets have been set for reclamation of permanent sloping agriculture land and slash and burn areas to safeguard productivity. Despite such initiatives, areas treated under land rehabilitation program have lagged behind total crop sown areas. Growing populations in upland areas have resulted in a large expansion in crop sown areas, while multiple cropping has become more common and conservation programs have not kept pace. Whereas total crop sown areas increased from 26 million in 1985 to 55 million in 2008, the percentage of rehabilitated agriculture land to the total crop sown area diminished from 12% in 1975 to 3% in 2008. Declining funding for conservation and rehabilitation measures will need to be reversed if the problem of land degradation and vulnerable farmland is not to worsen. The Government recognizes that more work is needed to safeguard the productivity of upland farms under pressure of growing populations through extension support on soil conservation methods and provision of related technologies to farmers.

7. The issue of **climate change** has only recently been assessed as a high priority in Myanmar. The Government's perspective changed fundamentally after the severe cyclonic storm Nargis, which caused large loss of life, destruction, and livelihoods impacts. Myanmar's vulnerability to climate change is now widely recognized, with the country coming second in world rankings. Potential climate change-related impacts on Myanmar include incremental sea-level rise, saltwater intrusion, loss of mangroves, increased incidence of droughts, loss of biodiversity and ecosystems such as wetlands, and loss of land resources. Myanmar is already experiencing the effects of climate change, with a clear trend of rising temperatures, shortening of monsoon duration, and increased frequency of intense rainfall and severe cyclones along Myanmar's coastline.

8. While climate change is mainly related to global phenomena, national actions in Myanmar are both contributing to climate change globally and the country's vulnerability in terms of human health impact, agricultural security and loss of biodiversity. Deforestation is of particular concern, with decreasing forest cover and quality reducing adaptive capacity and potential to absorb greenhouse gasses. Forest fires represent an additional climate change pressure, especially in dry forests which dominate the central part of the country.

9. The Government is responding to climate change risk and vulnerability, quickly putting in place a national plan for disaster risk reduction. Although there is currently no national policy target, Myanmar has made several international commitments, including the United Nations Framework Convention on Climate Change (UNFCCC) and the related Kyoto Protocol which were ratified in 1994 and 2003, respectively. Mitigation and adaptation measures encompass various policies, plans, programs, projects and activities. Generally, the Government is devoting attention to better understanding climatic pattern conditions and trends, and links to underlying pressures such as deforestation. Response targets and objectives are also being set for increasing forest plantation and promoting use of alternative fuels.

10. Myanmar's rising population and accelerating pace of economic development are generating increasing volumes of **solid waste**. This represents a challenge to municipalities concerned about the environmental and human health consequences associated with inadequate waste management practices. While solid waste generation per capita has remained constant or declined in large cities such as Mandalay and Yangon, total waste generation is increasing as urban populations expand. Approximately 22% of municipal solid waste in Myanmar is recyclable, with the remainder being managed through other disposal methods, predominantly open landfills and to a lesser extent incineration.

11. There is considerable scope for improvement in urban solid waste management. Although responses by civic authorities in large cities have been generally satisfactory in terms of expenditure on waste collection and disposal, additional budget expenditure is needed to improve long term waste management nationally. Increased spending on waste collection vehicles will be required to improve coverage and efficiency while investment is needed in more modern and reliable disposal systems, including replacing open dumps with sanitary landfills and installation of environmentally-appropriate incineration plants. Expansion of solid waste collection and disposal to other cities is also needed, with the situation remaining unsatisfactory in second-tier cities and towns where performance has stagnated or even deteriorated slightly.

12. Myanmar has a rich natural capital endowment, encompassing significant ecological **biodiversity** features like wet/evergreen forests in the southern part of the country, deciduous Dipterocarp forests and thorn scrub in the central part, and sub-alpine forests in the north. Large, slow-flowing rivers and large lakes support extensive freshwater ecosystems, while expansive seacoasts with tidal mangroves sustain vital marine ecosystems.

13. Myanmar's biodiversity is under increasing threat, especially in the Indo-Myanmar hot spot where a combination of economic development and human population growth is placing pressure on natural habitats and species populations. Major contributors to biodiversity loss are: (i) conversion of closed forests for other land uses, (ii) shifting cultivation, (iii) weak regulation and control of commercial exploitation and trade in endangered flora and fauna, and (iv) lack of sufficient environmental impact assessment and integration of biodiversity concerns in development activities affecting land use change. Forest degradation is of particular importance in terms of terrestrial biodiversity, potentially affecting approximately 36% of threatened mammals and birds. Additionally, loss of wetlands and grasslands is threatening bird species. For example, mangrove forests drastically declined from 253,018 hectares in 1924 to 71,716 hectares in 2008, with only 28% of original mangroves remaining.

14. The Government has responded to biodiversity loss primarily through establishment of protected areas. To accomplish the goal of 'promote the conservation of the biological diversity of ecosystems, habitats, and biomes', a national policy target was set in 1980 to establish a network of protected areas covering 5% of the country's total area by 2010. The protected area system expanded steadily, particularly during the period 1996-2004, with the system currently comprising 34 protected areas equivalent to 4.35% of total land area. The Government has also been increasing efforts to prevent illegal wildlife trade, with Myanmar acceding to CITES in 1997. The Government has been taking action against illegal wildlife trade in collaboration with law enforcement departments in order to minimize and prevent illegal wildlife trade.

15. The **mining** industry has become one of the country's key development sectors in recent years, attracting considerable foreign investment and generating important export earnings. Myanmar is endowed with a variety of mineral resources, and also produces high-quality gems and precious stones. Moreover, exploitable reserves of industrial minerals are available. The annual growth rate of mining production during the period 2001-2006 was 15.5%, which is higher than gross domestic product growth.

16. Awareness of environmental disturbances caused by mining is increasing but has not yet been accompanied by substantive regulatory responses. While Myanmar lacks a specific national policy target for environmental improvement in the mining sector some relevant sector policies exist, including the 1994 Mines Law intended to protect against environmental effects caused by mining operations, and to restrict mine operators from conducting any activities which may have detrimental effects to the public. All mines are theoretically subject

to regular inspection and monitoring and reporting requirements but there is a shortage of both training monitoring personnel and air and receiving water quality data against which to assess impacts and effectiveness of control and mitigation measures. Recognizing these limitations, attention is being devoted to enhanced monitoring of environmental quality in mining areas. Demands are also being made on the mining industry concerning environmental data acquisition and reporting, ensuring compliance with applicable industry standards, and adoption of best practices.

II. Policy and Institutional Framework

17. The Government is working to put in place the policies, legislation and regulations needed to properly manage the country's natural resources and environment, encompassing: (i) environment policy and legislation, (ii) a sustainable development strategy, (iii) forest policy and master planning, (iv) biodiversity protection area system establishment, (v) soil conservation and land rehabilitation programs, (vi) disaster risk reduction planning, and (vii) mining legislation. The challenge is to now build on this policy base through improved implementation, necessitating significant strengthening of financial and human resources, and expanded awareness of environmental issues.

18. The recent formation of the Ministry of Environmental Conservation and Forestry (MECF) demonstrates the Government's commitment to improved natural resources and environment planning and management. The 2012 Environment Law provides the legal basis for implementing a range of enhanced environmental management measures. Attention need now shift to drafting corresponding regulations to enact legislation, including regulations and technical guidelines on environmental safeguards and pollution abatement. Developing regulations and guidelines, and creating the enabling conditions for effective implementation will require substantial effort and technical expertise. Additionally, Government capacity to undertake environmental monitoring will need to be built and institutional linkages forged to ensure necessary inter-agency coordination on environmental management.

III. Environmental Prospects and Future Needs

19. At present the natural environment in Myanmar remains relatively pristine, reflecting the vastness of the resources, the area they cover, their inaccessibility, and the isolation of the country itself both physically and (until recently) economically. Myanmar still contains some of the most unique physical and biological natural resources in Southeast Asia and the world. Fledgling policies are in place to protect these resources but serious pressures have been placed on them in the recent past and these are more than likely to intensify. The financial, human and logistical resources available to counteract these pressures are very limited, even with the expectation of international help and support. The primary hope to preserve and conserve as much of the country's natural resources and environmental values as possible is to focus on the identification of priority areas and hotspots as well as priority sectors (i.e., mining, hydropower development, forestry) and ensure that the existing policies, laws and regulations are applied and enforced. Coverage can then, in the medium term, be expanded to the country as a whole. Ultimately a compromise will need to be reached between environmental conservation and the country's overall economic development. Hopefully this can be done without the seriously negative environmental impacts seen in some neighboring countries.