

Development of environmental management mechanism in Myanmar

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Published online: 17 June 2008
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Abstract The paper outlines the major efforts in developing the environmental management mechanism in Myanmar. It covers the inception of a national level organization established to handle the environmental issues of the country: why it is not so effective as intended, examines the current laws and policies designed to address these issues, discusses the current practices in environmental conservation and identifies new initiatives to integrate environmental policy objectives into sector-wise development policies.

Introduction

Officials of Myanmar recognize that with a certain development in the country, deforestation, water pollution and other adverse environmental conditions may have occurred, though off the record, from various economic and industrial sectors. Like elsewhere in the world, the demands of a growing population and a market-oriented economy have altered consumption patterns and infringed on natural resources. In the effort to keep a balance between development and environment, Myanmar has made efforts and will have to sustain them to protect the environment. Whatever the awareness and commitment, the efforts may not be perfect in achieving this comprehensive task; there is strength and so are the weaknesses. This paper is to track down the success in this aspect and identify the challenges that may be awaiting.

Awareness

The awareness of the general public increases gradually thanks to the media. Especially the written media keep a steady watch on environmental issues. Yet

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their interest is still on such general ideas as the management of municipal waste and the conservation of natural landscapes, keeping away from industrial pollution and management. In Myanmar, most factories do not produce toxic chemicals but use some such as lead as raw materials in their manufacturing processes. A few factories such as paper mills, leather factories, textile factories, distillery plants and some mining activities generate a certain amount of industrial wastes.

The responsible officials of the Union of Myanmar Federation of Chamber of Commerce and Industry (UMFCCI) claimed their inspection of upper Myanmar industries in 2005 and observed that waste waters from vermicelli factories contained very high level of methane and up to 400,000 gallons of waste water might be discharged per year. They also stated that almost all industrial and household wastes are directly discharged into the water bodies without being treated. Chemical Industry Group of the UMFCCI claimed that it had been carrying out "Responsible Care" activities in chemical industries of Myanmar. At the informal meeting of industrial zones with the Myanmar Engineering Society, there had been discussions on the reduction of biological oxygen demand (BOD), some measurements of which indicated over 3,000 mg/l (Maung 2005).

Land uses are being changed in major urban centers and in rural environs as there is a great demand on conversion of land for residential, business and industrial purposes. A lack of land use planning can lead to serious environmental pollution to residential areas and to the reduction of farmland.

Policy implementation

The Government proclaimed the National Environmental Policy on 5 December 1994. In 1997, Myanmar Agenda 21, the purpose of which is to mobilize and focus national efforts to achieve sustainable development, was successfully formulated. Until 2005, the National Commission for Environmental Affairs (NCEA) was under the chairmanship of the Minister for Foreign Affairs. Now it has been under the control of the Ministry of Forestry. At sector-wise level, the Ministry of Agriculture and Irrigation, the Ministry of Forestry, the Ministry of Livestock and Fisheries, the Ministry of Industry (1), the Ministry of Mines and other related ministries had to cooperate as necessary. This can be summarized as follow (Table 1):

Environmental organizations

The National Commission for Environmental Affairs (NCEA) was formed in February 1990. The Commission was originally chaired by the Minister for Foreign Affairs and now reorganized under the Ministry of Forestry. In practice, different ministries and city development committees are acting separately in their own ways. In order to promote effective environmental management, the Environmental Conservation Committee (ECC) was formed in 2004 and its task force was to implement programs to effectively address environmental issues in the country. The present Committee is as shown in Fig. 1.

Table 1 Execution of environmental affairs in Myanmar

Organization	Area of competence
National Commission for Environmental Affairs (NCEA)	Environmental management
Ministry of Forestry	Forestry issues and wildlife conservation (Forestry Department)
Ministry of Livestock, Breeding and Fisheries	Marine and freshwater fisheries management
Ministry of Development and Planning	Industrial planning and foreign investment (with the Myanmar Investment Commission)
Ministry of Industry	Pollution from industrial activities (Directorate of Regional Industrial Coordination and Industrial Inspection)
Ministry of Agriculture	Environmental issues arising from agriculture
Ministry of Health	Health issues in relation to factories and vehicles (Department of Occupational Health, in collaboration with the Yangon and Mandalay City Development Committees)
Ministry of Road Transport	Vehicular emissions
Ministry of Labour	Health concerns of workers
City Development Committees of Yangon and Mandalay	Air pollution, waste disposal, general environmental issues in the cities of Yangon and Mandalay

One active non-government environmental protection organization in Myanmar is Forest Resources Environment and Development Association (FREDA). Other NGOs that can directly or indirectly serve environmental protection are Union Solidarity and Development Association (USDA), Myanmar Maternal and Child Welfare Association (MMCWA), monasteries and Myanmar Red Cross Society. However, at present, these local NGOs do not conduct joint activities with the NCEA.

Foreign NGOs that have been engaged in Myanmar environmental issues are the United Nations Development Program (UNDP), the Wildlife Conservation Society (WCS) and the Smithsonian Institution.

Local activities

Every year there is a nation-wide tree planting program for the purpose of greening non-forest areas. Annually, school children, local community and non-governmental organizations take part in planting millions of seedlings under this program. Among the various projects undertaken in Myanmar, one important endeavour is the greening of the dry zone. The initial project which began with the nine districts has now been expanded to a total of 13 districts.

International cooperation

On the international front, Myanmar has signed international conventions such as United Nations Framework Convention of Climate Change (UNFCCC), Convention on Biological Diversity (CBD), Convention on the Protection of the Ozone Layers, UN Convention to Combat Desertification (UNCCD), and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITIES). This is summarized in Table 2.

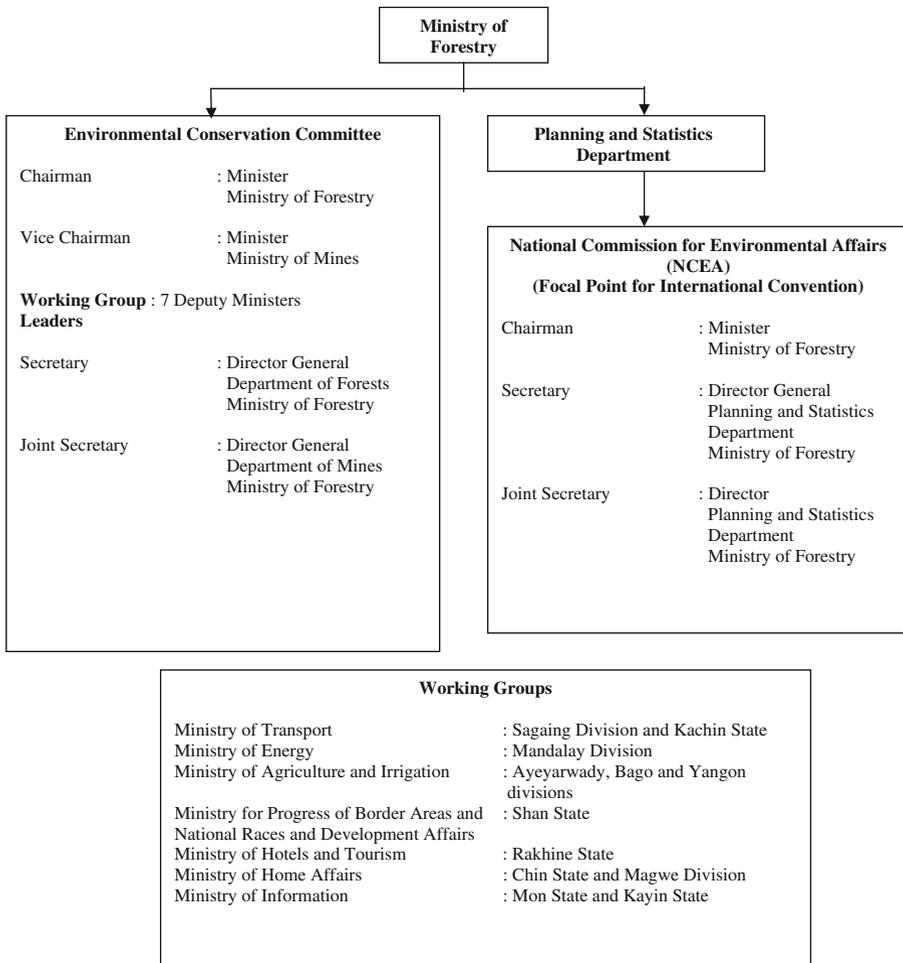


Fig. 1 National Environmental Organization of Myanmar

The Workshop for Investment Promotion and Environmental Protection in Mining Sector in ASEAN was held in Myanmar in December 1998. The 9th ASEAN Ministerial Meeting on the Environment and the 2nd ASEAN+3 Environment Ministers Meeting was held in Myanmar in December 2003.

Industrial zone management

The development of new industrial zones since 1995 is a major tool for the socio-economic development in Myanmar. The creation of industrial zones is a key part of policy and strategy to speed up industrialization throughout the country. In principle, new industrial zones offer a potential environmental benefit by creating opportunities for more effective industrial pollution control. However, in practice, most

Table 2 International conventions ratified or signed concerning environment

International Conventions Concerning Environment	Year
Plant Protection Agreement for the Southeast Asia and Pacific Region	1959
Treaty Banning Nuclear Weapons Test in the Atmosphere in Outer Space and Under Water	1963
Outer Space Treaty: Treaty on Principles Governing the Activities of States in the Exploitation and Use of Outer Space including the Moon and other Celestial Bodies	1970
Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological and Toxin Weapons, and their Destruction	1972
Vienna Convention for the Protection of the Ozone Layer	1985
Montreal Protocol on substances that Deplete the Ozone Layer	1987
MARPOL: International Convention for the Prevention of Pollution from Ships 1973	1988
MARPOL Protocol: Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships 1978	1988
Agreement on the Networks of Aquaculture Centers in Asia and the Pacific Region 1988	1990
London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer	1990
United Nations Framework Convention on Climate Change (UNFCCC)	1992*
Treaty on the Non-Proliferation of Nuclear Weapons	1992
ICAO: ANNEX 16 Annex to the Convention on International Civil Aviation Environmental Protection Vol. I, II, Aircraft Noise	1992
United Nations Convention to Combat Desertification	1994*
Vienna Convention for the Protection of Ozone Layer	1994*
Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)	1994
London Amendment to the Montreal Protocol	1994
Convention on the Prohibition of the Development, Production and Stockpiling and Use of Chemical Weapons and their Destruction	1994
Convention Concerning the Protection of the World Cultural and Natural Heritage	1994
Convention on Biological Diversity (CBD)	1995*
United Nations Convention on the Law of the Sea	1996
International Tropical Timber Agreement: ITTA	1997*
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	1997*

*Myanmar has signed these international environmental conventions

Source: Myint (2003); Lay and Win (2002)

industrial zones have not implemented planned centralized waste treatment and solid waste management facilities.

The **State Peace and Development Council** (SPDC) formed the Myanmar Industrial Development Committee (MIDC) in 1995 with 15 ministers as members and deputy ministers as secretary and joint secretary. The committee then organized MIDC Working Committee with the Minister of Ministry of Industry (2) as Chairman and the Director General and a Director of the Directorate of Myanmar Industrial Planning as Secretary and Joint Secretary respectively. The Working Committee implements all the tasks laid down by the MIDC with the assistance of nine sub-committees.

MIDC designated 18 industrial zones in areas where there exist substantial numbers of private industries. Previously almost all private industries were operating in towns and cities creating pollution, causing electricity shortages in the neighbourhood and other problems such as health hazards, and the dangers of fire. Yangon city faced many difficulties with the rise in population and modern buildings. The department of Human Settlement and Housing Development

therefore established industrial zones or parks around Yangon to mitigate these problems. Each industrial zone is managed by a zone management committee whose members are appointed by the Regional Industrial Supervision Committee.

Legislation

Myanmar has made some progress in developing a set of policies, laws and regulations to define the framework for environmental management. There exist related laws and regulations to protect the environment. Nevertheless, some of them were enacted before gaining independence in 1948 and they were primarily prevention-oriented with less emphasis on conservation and sustainable use. On the one hand, recent policies and laws enacted by a number of ministries constitute elements or provisions that are directly related to environmental conservation and protection. Yet they have not been fully implemented.

Major laws and regulations relating to environmental protection and conservation can be briefed as in Table 3.

Environmental capabilities

Myanmar officials have claimed that there has been some progress in developing a set of policies, laws and regulations to define the framework for environmental management. As stated in Table 3, there are certain laws and regulations to protect the environment. Unfortunately they have not been fully implemented because of:

- lack of political commitment
- absence of any mechanism for implementation (e.g. no funding)
- unclear and fragmented responsibilities
- unrealistic goals and expectations

The establishment of NCEA demonstrates that the government is aware of the need for institutional mechanisms to effectively address environmental issues. In practice, NCEA has not yet been fully recognized as a statutory body that has authority to issue policies and implement them.

Despite the creation of NCEA, decision-making in Myanmar lacks the incorporation of the environmental dimensions necessary for sustainable development. Environmental protection efforts are conducted under the authority of the respective departments and ministries that are statutorily separate from NCEA. This institutional arrangement has delayed the development of NCEA as a statutory body. Formation of NCEA under the Ministry of Foreign Affairs once was a question for observers to ponder. It had been criticized that the creation of NCEA under the Ministry of Foreign Affairs was to showcase its image to the outside world.

Myanmar Engineering Society (MES), an NGO of the country, has made some suggestions with a reference to the UN proposal that the organization structure be similar to the one shown below (Fig. 2).

MES also proposes a procedural flow for environmental impact assessment for an industrial project, which is illustrated in Fig. 3. The procedure is idealized for the implementation of a mining project.

Table 3 Major laws and regulations relating to environmental protection and conservation

Law and regulation	Year	Purpose
Factory Act	1951	To make effective arrangements in every factory for disposal of waste and effluence, and matters on health, cleanliness and precaution against danger.
Public Health Law	1972	To promote and safeguard public health and to take necessary measures in respect of environmental health.
Territorial Sea and Maritime Zone Law	1977	To define and determine maritime zones, contiguous zones, exclusive economic zones and the continental shelf and the right of the Union of Myanmar to exercise general and exclusive jurisdiction over these zones and the continental shelf in respect of preservation and protection of the marine environment and prevention of marine pollution.
Fishing Rights of Foreign Vessels Law	1989	To conserve fisheries and to enable systematic operation in fisheries with participation of foreign investors.
Marine Fisheries Law	1990	To conserve marine fisheries and to enable systematic operation in marine fisheries.
Pesticide Law	1990	To direct the Myanmar Agriculture Service to analyze and test pesticides or any active ingredient received as samples as to conformity with the content of ingredient as claimed on the label; and to undertake bio-efficacy trials on crops for determining effectiveness in practical use.
Private Industrial Enterprise Law	1990	To cause narrowing down of the gap between rural development and urban development by causing the development and improvement of industrial enterprises; to cause avoidance of or reduction of the use of technical know-how which cause environmental pollution; to cause the use of energy in the most economical manner.
Forestry Law	1992	To implement forest policy and environmental conservation policy, to promote public cooperation in implementing these policies, to develop the economy of the State, to prevent dangers of destruction of forest and biodiversity, to carry out simultaneously conservation of natural forests and establishment of forest plantations and to contribute towards the fuel requirement of the country.
Plant Pest Quarantine Law	1993	To prevent quarantine pests from entering into Myanmar by any means; to suppress effectively the spread of quarantine pests.
Development of Border Areas and National Races Law	1993	To cherish and preserve the culture, literature and customs of the national races; to preserve and maintain the security, prevalence of law and order and regional peace and tranquility of border areas.
National Environmental Policy	1994	To establish sound environment policies in the utilization of water, land, forest, mineral resources and other natural resources in order to conserve the environment and prevent its degradation.
Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law	1994	To protect wildlife, wild plants and conserve natural areas, to contribute towards works of natural scientific research, and to establish zoological gardens and botanical gardens.

Table 3 (continued)

Law and regulation	Year	Purpose
Myanmar Mines Law	1996	To implement mineral resources policy. To protect the environmental conservation works that may have detrimental effects due to mining operation.
Protection and Preservation of Cultural Heritage Regions Laws	1998	To implement the protection and preservation policy with respect to perpetuation of cultural heritage that has existed for many years; to protect and preserve the cultural heritage regions and the cultural heritage therein so as not to deteriorate due to natural disaster or man-made destruction.
Fertilizer Law	2002	To boost development of agricultural sector, control fertilizer business, and to facilitate conservation of soil and environment.
Conservation of Water Resources and Rivers Law	2006	To conserve and protect the water resources and rivers system for beneficial utilization by the public; to prevent serious environmental impacts.

Source: ADB and UNEP (2004); SPDC Laws

Environmental management system (EMS)

Another proposal made by MES for environmental protection is to adopt an Environmental Management System (EMS) for an industrial project, more or less like ISO 14001, as outlined in Table 4.

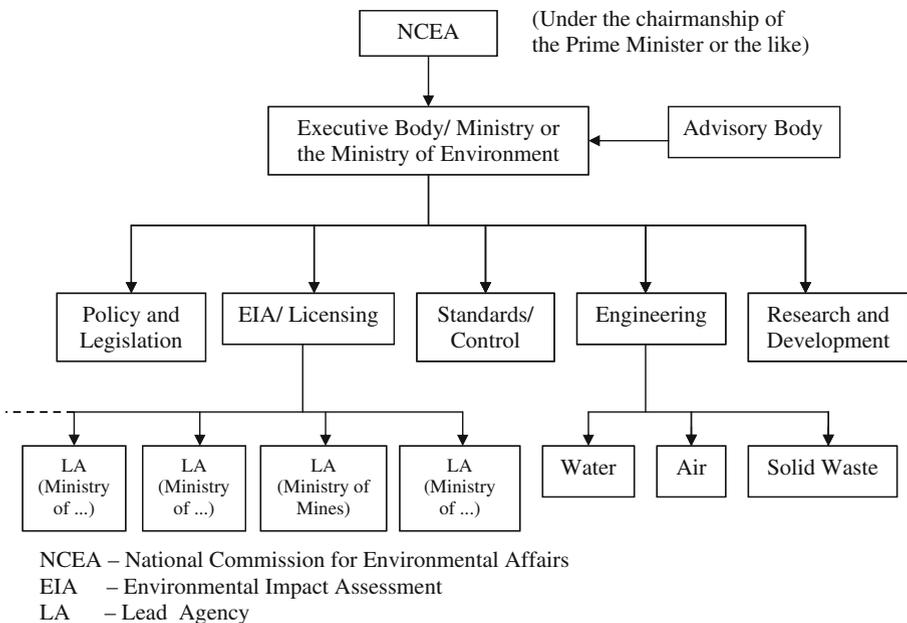
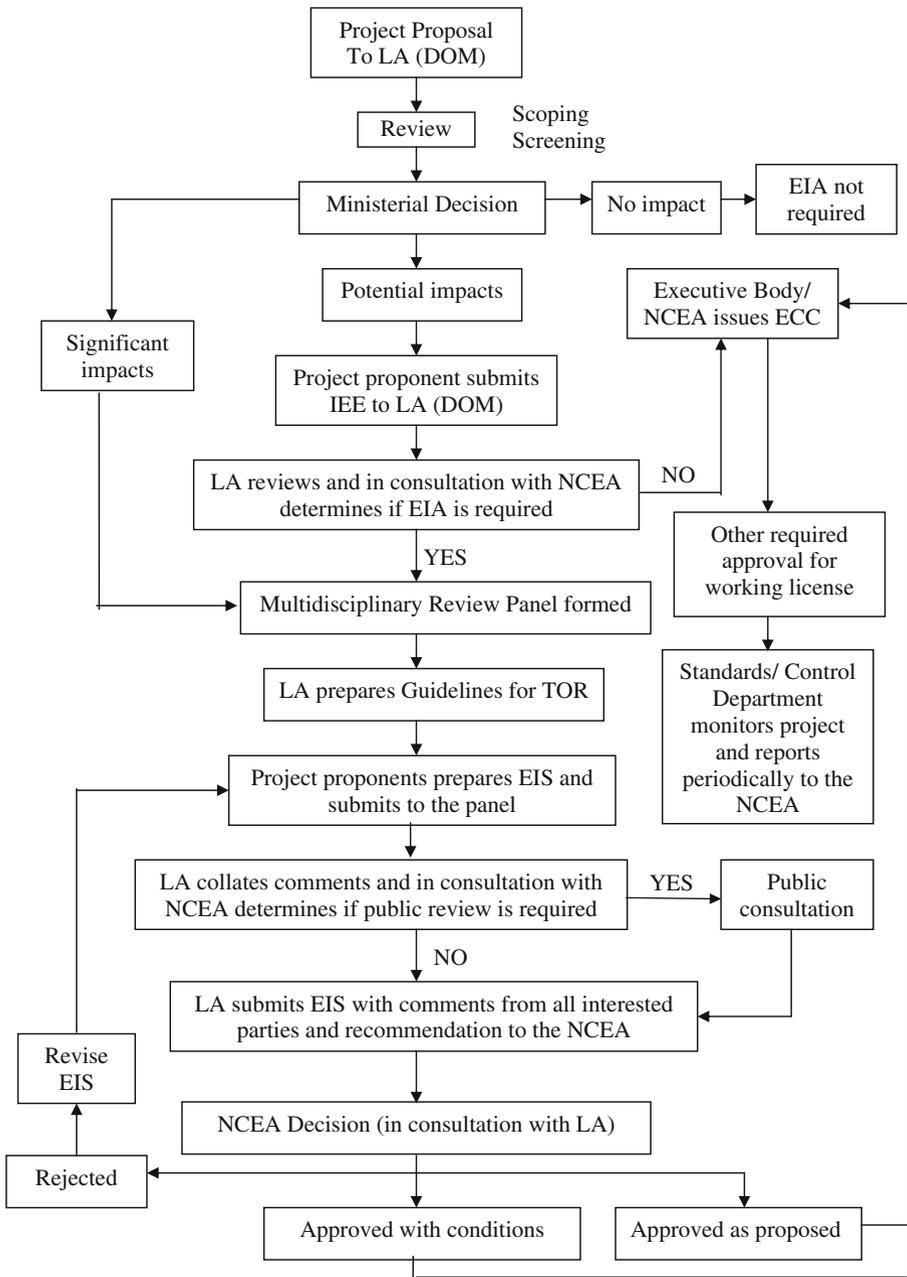


Fig. 2 MES-proposed Environmental Organization Structure. Source: Environmental Management Committee (2008)



- LA – Lead Agency
- DOM – Department of Mines
- EIS – Environmental Impact Statement
- TOR – Terms of Reference
- ECC – Environmental Compliance Certificate

Fig. 3 Procedure for gaining ECC for a mining project

Table 4 EMS proposed by MES

Activity	Item of standard	Description	
Prepare	Initial environmental survey	Organization identifies elements that noticeably affect the environment. Record of past environmental management is also investigated.	
Plan	4.2 Environmental policy	Independent management philosophy and policies are clearly indicated by top management and understood by all employees.	
	4.3.1 Environmental aspects	Elements that affect the environment	
	4.3.2 Legal and other requirements	Laws, regulations, ordinances, and voluntary action plans applicable to each activity of the organization are satisfactorily understood. There is an awareness of surrounding installation sites in order to consider effects on the environment. The latest information is obtained and understood.	
	4.3.3 Objectives and targets	Specific objectives and targets for achieving environmental policy.	
	4.3.4 Environmental management program	Specific techniques for achieving targets.	
	Do	4.4.1 System and responsibility	Authority and responsibilities are clearly understood within the organization.
		4.4.2 Training, awareness and ability	Knowledge required by organization's members is sufficiently available and there is an awareness of one's responsibilities.
4.4.3 Communication		Organizational rules concerning reporting and making contact are established.	
4.4.4 Environmental management system documentation			
4.4.5 Document control		When necessary, anyone in the organization can check the latest version.	
4.4.6 Application management			
4.4.7 Preparation and response to emergencies		There is an awareness of the environmental effect caused by an earthquake, fire, natural disaster, or other emergency that occurs.	
Check	4.5.1 Monitoring and measurement	There are rules for periodically checking the status of progress aimed at target achievement.	
	4.5.2 Noncompliance, corrective action and preventive action	Measures are in place not only for taking action after problems occur, but also for preventing problems from occurring.	
	4.5.3 Records		
	4.5.4 Environmental management system audits	Are plans for the continuous improvement of the EMS, including ISO 14001 standards, making suitable progress?	
Act	4.6 Management review	Managers can monitor the status of the overall organization, and their decisions and instructions are being disseminated within the organization.	

Clean development mechanism (CDM)

The government of Myanmar signed the United Nations Framework Convention on Climate Change (UNFCCC) on 11 June 1992 and ratified the convention on 25 November 1994. Myanmar is also a party to several international and regional conventions and agreements relating to the climate change and GHG emission reduction.

Myanmar ratified Kyoto Protocol in 2003 as a non-Annex I party. As a developing country, Myanmar can host a CDM project in collaboration with Annex I countries.

Myanmar started a GHG emission inventory project, titled “Asia Least-cost Greenhouse Gas Abatement Strategy” in 1995. The project assessed the GHG emissions in energy, forestry and land-use change, and agricultural sector setting 1990 as base year. Based on the data collected during the project, the projection of GHG emissions to 2020 was estimated.

The Designated National Authority (DNA) was established in 2006 in order to approve the proposed CDM projects at national level, to coordinate and facilitate implementing CDM projects in various sectors of Myanmar, to connect with international organizations for CDM project activities, and to provide information on CDM projects to related ministries, organizations and private sectors. DNA of Myanmar is led by the minister of Ministry of Forestry.

Since the baseline emissions by Myanmar are relatively low in many sectors, CDM projects on GHG emission reductions are likely to be fewer than those on sequestration. On the one hand, there are certain sectors in which GHG emission reduction activities have relatively high potential. They are energy industries, waste handling and disposal, transport, agriculture and afforestation and reforestation. However, challenges like awareness, transaction cost, initial investment and technology obviously exist in the way.

Weaknesses in environmental protection

As a developing country, it is natural for Myanmar to encounter difficulties in carrying out such a comprehensive task. The barriers in environmental protection of Myanmar are rooted in the following areas:

1. Institutional development (Organizations);
2. Framework laws and detailed regulations;
3. Budget or resource capacity; and
4. Knowledge on EIA or environmental education.

Institutional development (Organizations)

The National Environmental Policy places great emphasis on sector-wise and regional environmental planning to integrate environmental considerations into socioeconomic development planning. Myanmar Agenda 21 can be regarded as the main strategy and includes program areas. However it lacks detailed environmental action plans for major economic regions to demonstrate the importance of sound environmental planning and safeguard shared natural resources and systems.

Until now, the Environmental Protection Law has not yet been passed and enterprises were established with little, if any, regard to environmental pollution control. Today, many enterprises are struggling with restructuring, limited availability to capital, insufficient technology, and the responsibility for social welfare of thousands of people. Consequently, they lack capital and the capacity to implement effective environmental pollution control measures.

Framework laws and detailed regulations

As a national level organization, NCEA must focus, as the National Environmental Action Plan, on:

- Drawing up comprehensive environmental legislation, reviewing and drafting sector-wise legislation;
- Conducting environmental impact assessments and setting up environmental standards;
- Collecting environmental data;
- Promoting environmental awareness; and
- Setting up sector-wise linkages.

In reality, there is at present no appropriate and working mechanism or legislation to address environmental problems that require input and compliance from different sectors. NCEA is presently focusing on promoting public awareness for environmental protection and securing the active participation and cooperation of the public in environmental conservation efforts. Among the listed actions in the National Environmental Action Plan, promoting environmental awareness has perhaps achieved the most success.

Although Myanmar has a number of environment-related laws and regulations, they are broad and do not often have substantive and specific standards or regulations in practical governance of daily environmental issues. Moreover, there is no mechanism to combine and implement these laws. All this leads to the question about the country's willingness to pay sufficient attention and to deal with environmental affairs effectively.

Budget or resource capacity

Even though NCEA is tasked with overall coordination of environmental issues, inadequate budgetary and manpower resources within NCEA form a big impediment to effective performance. There has not been any official report as to how much of the annual budget is appropriated for environmental governance, such as for building infrastructure, monitoring and enforcing environmental laws and training staff. As a Commission (as opposed to a full-fledged Ministry), NCEA lacks the authority, power and expertise needed to carry out its functions at optimal effectiveness. Especially there is a severe lack of trained manpower and financial resources to perform legislative and enforcement functions such as enacting regulations, monitoring, testing in laboratories, prosecuting violators etc.

Knowledge on EIA or environmental education

One of the challenges in solving environmental problems in Myanmar is the understanding level of environmental impact assessment (EIA). Myanmar Agenda 21 recognizes the need for EIA laws. At present, NCEA does not have the authority to require the commissioning of EIA. Legislation should thus be passed to confer

NCEA with legal authority to issue comprehensive guidelines and regulations on the size and types of projects requiring EIAs, to prescribe the format and content of EIA reports, to coordinate the grant of operating licenses to industries, and to ensure compliance with EIA guarantees. In addition, training and manpower development are required to develop NCEA's expertise to manage the whole EIA process.

Conclusion

Although environmental awareness is gradually rising in Myanmar, there is only a partial integration of environment into development, mainly in the form of natural resources conservation projects carried out by the sector-wise ministries and departments. A strengthened environmental institution needs to be complemented by a framework law on environmental matters. This will ensure a more integrated approach to environmental decision-making, greater coordination of the respective ministries and greater manpower and financial resources from both local and foreign sources. NCEA needs officials and staff who will concentrate fully on environmental issues. At present the officials making up the sub-committees of NCEA hold other full-time positions, which make them unable to devote sufficient resources to environmental issues.

Existing laws and regulations need to be updated, reviewed and consolidated into a framework law that can provide effective consultation process among different agencies, central authority and divisional/state authorities. There is also a need to legislate EIA laws and other implementing regulations to deal with various environmental issues. It is time to introduce the practice of environmental studies, environmental impact assessment (EIA), and effective environmental management systems (EMS) in the country. One difficulty is that there are no widely approved effluent standards to control the discharges from industries. For the time being, most of the industries in the country are not yet ready to adopt ISO 14001, Eco-Management Audit Scheme (EMAS), Integrated Management System (IMS) or similar environmental management systems. Moreover, impact identification and impact assessment for development project by a multidisciplinary team is still uncommon.

International conventions signed by Myanmar can be used to monitor its environmental affairs. International environmental NGOs and UN agencies can engage in training for environmental laws related to the conventions to which Myanmar is a party.

All things considered, the development of environmental management mechanism in Myanmar will depend on the existence of good governance practices, namely transparency, accountability, rule of law, an independent judiciary system, and mechanisms to encourage local participation in environmental decision-making.

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