NEEDS ASSESSMENT FOR EFFECTIVE IMPLEMENTATION OF THE **ENVIRONMENTAL CONSERVATION LAW** IN MYANMAR

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EXECUTIVE SUMMARY

Overview and approach of the needs assessment

The objective of this needs assessment was to identify areas in Myanmar's current environmental governance that should be strengthened to better respond to current and anticipated environmental challenges. The focus is on the effective implementation of the recent Environmental Conservation Law (ECL, 2012) that provides the general legal framework for environmental conservation in Myanmar and the role of the Environmental Conservation Department (ECD) of the Ministry of Environmental Conservation and Forestry (MOECAF) as the main actor responsible for its implementation. Coordination, cooperation and participation of other line ministries and organizations is needed to implement the environmental conservation in ECL.

The assessment was funded by the Ministry for Foreign Affairs of Finland (MFA) and United Nations Development Programme (UNDP) Myanmar and carried out by a team of experts from the Finnish Environment Institute (SYKE) and UNDP. It is based on an extensive review of official and informal documents, available studies and project reports. A large number of interviews were carried out with government officials, development partners and independent experts. Two consultation workshops were organised to engage views of civil society organisations (CSOs) and representatives of the private sector on environmental governance and management in Myanmar. Based on the collected data, the regulatory framework for environmental conservation and management in Myanmar was analysed along with the existing governance arrangements and practices, capacities and resources for its implementation. Recent and ongoing activities by development partners to support the environmental governance in Myanmar have also been covered in the assessment.

From the various data collected, gaps and needs were analysed for the following thematic areas arising from the ECL and key environmental challenges facing Myanmar:

1. National and regional planning to implement environmental policies
2. Environmental licensing, including EIA and SIA
3. Pollution control
4. Management of chemicals and hazardous substances
5. Urban environmental management
6. Economic mechanisms in environmental protection
7. Conservation of natural resources, biodiversity and cultural heritage
8. International environmental agreements
9. Environmental information management, dissemination, research and training
10. Access to environmental justice

Based on the gaps and needs, priority areas for strengthening the role of the ECL and its implementation were identified at the policy level, in practical implementation of the regulatory framework, in capacity development, information management, monitoring capacity and research, and in public participation and access to information.

Findings of the assessment

Myanmar has a well-developed set of general environmental strategies and objectives. Bold and strong visions for the state of the environment and sustainable development have been enshrined in environmental policies and development strategies and reaffirmed repeatedly in official speeches and statements. At the same time, several important challenges have been identified in implementation of the policies and steps towards realization of these visions.

The study confirms the complexity of environmental governance in Myanmar. Several branches and several levels of government play important

roles in ensuring environmental management and conservation. The need for coordination is recognized in the ECL, but institutions, processes and procedures based on the ECL are still in a formative stage. This is reflected in uncertainties with respect to procedures in environmental matters, unclear responsibilities and lack of detailed regulations and guidance.

Despite active development and capacity building efforts to improve environmental governance, there are gaps in the fundamental administrative tools and setup needed for effective implementation of the ECL. Specifications of environmental conditions to guide the implementation of major development and infrastructure projects are lacking. The collection and availability of baseline and monitoring data - both with respect to emissions and the state of the environment - registries of environmentally significant activities are poorly managed. These observed gaps create uncertainties for authorities, enterprises and civil society organisations. They hamper the collective learning that could gradually improve environmental management in Myanmar. There is also a need for capacity building within the environmental administration at the central and especially the regional level.

Policy level development is needed to strengthen the enforcement of the ECL but also for ensuring sufficient financing that the implementation requires. The use of the polluter pays principle can provide resources and also ensure the continuous improvement of environmental policies. The legislation in environmental priority areas needs to be supported by specific regulations and guidance as the ECL mainly provides a general framework. The ECD and its regional offices should, jointly with other local authorities, use their legal powers to initiate practical actions to improve the environmental conditions through waste management, air quality control as well as water and soil pollution. Adequate implementation will require more resources than are currently available. Adequate resources can be obtained by establishing a fair and legitimate public revenue collection system for recovering costs of the environmental administration.

Several specific areas have been identified for capacity development that would strengthen the enforcement of the ECL. These include sector-specific EIA guidelines and pollution control regulations concerning both emissions and ambient standards. Collection and management of adequate information and sufficient monitoring capacity are crucial for the practical enforcement of the ECL. The information management needs to be developed as a matter of urgency. It will support the work of authorities, developers and CSOs and also encourage public participation. CSOs are developing capacities in environmental matters and have access to a wide range of expertise. By encouraging their participation especially in EIA processes, MOECAF and the ECD can obtain important support for the implementation and enforcement of the ECL.

The role of the Environment Sector Working Group (ESWG, a cooperation platform for the Government of Myanmar and international development partners (DP) to coordinate development partner support to the environment sector in Myanmar[1]) is important in ensuring coordination among donor-financed activities in the environment sector. The large number of development partners and ongoing and planned projects implies that Myanmar's authorities are able to get remarkable external support for their work. There is, for example, strong attention to the development of EIA among a number of development partners with many projects focusing on this area. At the same time, it also means that the ECD, as the principal environmental authority, is under heavy pressure to manage the support from development partners. Coherence among the various interventions is essential and DPs should actively strengthen the coordination and cooperation of their technical assistance to ensure effective and coherent capacity building in the environment sector in Myanmar.

1 There is also an international Working Group on Environment under the Greater Mekong Sub-Region (GMS WGE), where ECD is the focal point of Myanmar. This report focuses on the ESWG in Myanmar.

Roadmap and key recommendations

The main aim of the roadmap for improving environmental policies and practice in Myanmar is to identify necessary actions for significant progress. Some of these actions should be initiated as soon as possible given that they will form the foundation upon which other activities can be built. These actions are needed to address the fundamental gaps in the ability to effectively implement existing environmental policies. Other proposed activities are by their nature longer-term efforts that require feasibility studies or research projects which support the specification of detailed priorities and future actions.

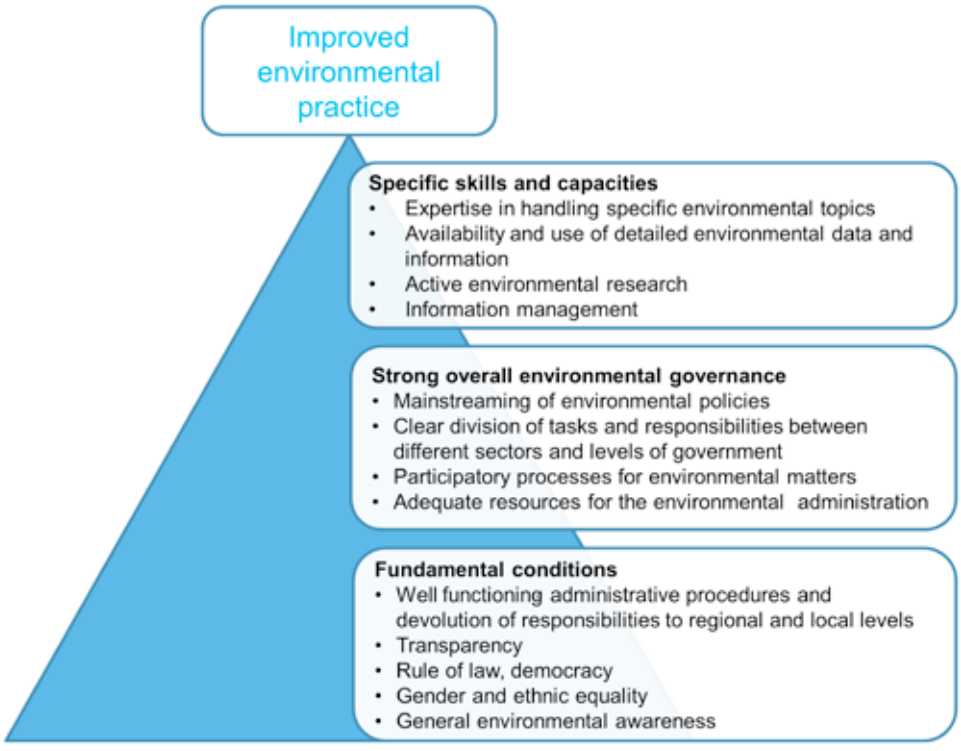
The current version of the roadmap does not include detailed cost estimates or timelines for individual activities. The cost will depend on the level of ambition, the duration of interventions and progress in general administrative capacities and practice. The roadmap provides indications of the magnitude and duration of the tasks. The project to formulate a *National Environmental Policy, Strategy Framework and Action Plan for 2016 to 2030* supported by UNDP Myanmar, initiated in October 2015, will provide opportunities to specify further details of these actions.

In developing Myanmar's environmental policies and practice the role of the ESWG is important. It has the potential to enhance social learning that helps the administration and development partners to focus and adjust activities for increased effectiveness. The ESWG can ensure that development partner projects support daily duties that are specified by the legislation. Coherence among the DP projects is essential in this respect.

The roadmap identifies five cross-cutting action areas. These include both urgent and immediate actions as well as longer-term commitments and efforts. Cross-cutting actions are closely linked to thematic areas of action. Costs range from small-scale projects to long-term significant investments. These are

1. Mainstreaming and integration of environmental considerations in relevant policy areas such as forestry, mining, hydropower, oil and gas, agriculture and tourism.
2. Clarification of responsibilities between authorities both horizontally and vertically

Figure: Pyramid for improving environmental practice



Children watching a local football match from tree in Myitkyina, Kachin State. Myanmar's rural areas are seeing high rates of deforestation and environmental degradation. *Mangshang Yaw Bawm, 2011*

and the development of human resources of authorities.

3. Ensuring the economic base for the environmental governance and ensuring economic sustainability of administration.
4. Strengthening public participation and access to environmental justice and information, especially in dealing with large-scale projects.
5. Strengthening of existing and establishment of new services in the environmental administration.

The thematic areas of action aim at strengthening the ECD and its role in implementing the ECL. For each of the following thematic areas, an overall objective has been identified along with priority areas of action.

With respect to **planning**, the objective should be to ensure that the principles and vision of Myanmar's environmental policies are translated into specific actions supported by plans that guide and prioritize them. To achieve this, progress is needed particularly in terms of concrete action and investment plans, watershed-based planning, but also for long-term visionary development of economic instruments.

In **EIA, licensing and compliance monitoring** the objective should be to ensure that the systems for EIA, licensing and compliance control operate smoothly and all stakeholders are able to participate in a fair and equitable manner. To achieve this, action is needed to ensure the legitimacy and acceptance of the systems for EIA, licensing, pollution monitoring and compliance control. The highest priority should be given to actions that ensure their effective implementation.

The objective of **pollution abatement and control** is to significantly reduce the release of pollutants into the environment. To achieve this, action is required for improving analytical capacity to detect and measure pollution, the specification of standards against which pollution can be measured, on the job training for officials and industry. In addition, financing mechanisms for investments in pollution control are needed.

For the **management of chemicals and hazardous substances**, the objective should be to ensure that the risks related to chemicals and hazardous substances are minimized. Action is required at the level of planning, clarification of the roles of authorities, capacity building of authorities and industry as well as availability of laboratory capacity and treatment facilities.

The need for effective **urban environmental management** is becoming increasingly urgent with rapid urbanization. The objective is to improve urban planning and management of the urban environment to allow for sustainable and equitable urban solutions. This will require reviewing the responsibilities and tasks in planning as well as mechanisms that ensure the adequate implementation of the plans. Action is required at the level of planning and development processes, in specific areas such as waste and wastewater management, transportation, awareness raising, public participation and financing of activities.

Conservation of natural resources and cultural heritage, including protection of biodiversity is an area only partly addressed in this roadmap. The objective should be to safeguard cultural and biological values of Myanmar and to ensure a sustainable use of Myanmar's rich natural resources. The pressures on Myanmar's natural resources - both marine and terrestrial resources - are increasing and action is needed to ensure progress towards sustainable practices. Priority actions include the clarification of roles of authorities, community management and taking biodiversity into account in all planning and management. The adoption and implementation of international management standards and practices such as CSR, the OECD principles and IFC performance standards would also contribute towards more sustainable management practices.

Awareness raising, information management, research, dissemination and training - including human resource development of the environmental administration - are of key importance. The overall objective should be to significantly increase the environmental awareness at all levels of society, ensure adequate management of environmental information and strengthen the production and use of environmental information in Myanmar. To achieve this, environmental awareness should be developed through many separate steps starting with education in schools and higher education, as well as reaching decision-makers in society. This requires access to environmental information which is supported by adequate data and knowledge management. This will also create a base for the strengthening of environmental research.

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Acronyms

ABS	access and benefit sharing
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BPSD	barrels per stream day
CBD	Convention on Biological Diversity
CBO	community-based organisation
COP	Conference of Parties
CSO	civil society organisation
CSR	corporate social responsibility
DALMS	Department of Agricultural Land Management and Statistics under MOAI
DDA	Department of Development Affairs
DIC	Directorate of Industrial Collaboration under MOI
DICA	Directorate of Investment and Company Administration under MNPED
DISI	Directorate of Industrial Supervision and Inspection under MOI
DMH	Department of Meteorology and Hydrology under MOT
DP	development partner
ECC	Environmental Compliance Certificate
ECD	Environmental Conservation Department
ECL	Environmental Conservation Law
EIA	environmental impact assessment
EITI	Extractive Industries Transparency Initiative
EMF	Environmental Management Fund
EMP	Environmental Management Plan
EPA	Environmental Performance Assessment
ER	Environmental Rules
ESIA	environmental and social impact assessment
ESWG	Environmental Sector Working Group
FAO	United Nations Food and Agriculture Organisation
FLEGT	Forest Law Enforcement, Governance and Trade
FPIC	Free Prior Informed Consent
GAD	General Administration Department of the Ministry of Home Affairs
GDP	gross domestic product
GEF	Global Environment Facility
GIS	geographic information system
GMO	genetically modified organism
GMS	Greater Mekong Sub-region
GMS-EOC	Greater Mekong Sub-region Environment Operations Center
GMS-WGE	Greater Mekong Sub-region Working Group on Environment
HRBA	human rights based approach
HW	hazardous waste
IEE	Initial Environmental Examination
IFC	International Finance Corporation
INGO	international non-governmental organisation
IUCN	International Union for the Conservation of Nature
IWRM	integrated water resources management
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
LMO	living modified organism
MCDC	Mandalay City Development Committee
MCRB	Myanmar Centre for Responsible Business
MEIP	Myanmar Environmental Information Portal
MFA	Ministry for Foreign Affairs of Finland
MIC	Myanmar Investment Committee
MNPED	Ministry of National Planning and Economic Development
MOAI	Ministry of Agriculture and Irrigation
MOECAF	Ministry of Environmental Conservation and Forestry
MOGE	Myanma Oil and Gas Enterprise
MOI	Ministry of Industry
MOM	Ministry of Mines
MOT	Ministry of Transport
NBC	National Biosafety Committee
NBSAP	National Biodiversity Strategy and Action Plan
NCA	National Competent Authorities
NEA	Norwegian Environment Agency
NECC	National Environmental Conservation

	Committee
NEHAP	National Environment and Health Action Plan
NGO	non-governmental organisation
NIVA	Norwegian Institute for Water Research
NSDS	National Sustainable Development Strategy
OECD	Organisation for Economic Co-operation and Development
PAT	Proposal Assessment Team of the MIC
PCCD	Pollution Control and Cleansing Department at city level
PCD	Pollution Control Division of ECD
PES	payment for ecosystem services
POP	persistent organic pollutant
PPP	polluter pays principle
REC	Regional Environment Committee
SEA	strategic environmental assessment
SEZ	Special Economic Zone
SIA	social impact assessment
SOER	State of Environment Report
SWIA	sector-wide impact assessment
SYKE	Finnish Environment Institute
TA	technical assistance
TDSC	township development support committee
TMC	township management committee
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention of Climate Change
UN-HABITAT	United Nations Human Settlements Programme
UNIDO	United Nations Industrial Development Organisation
USAID	United States Agency for International Development
VTA	Village Tract Administrator
W/VDSC	ward/village tract development support committee
WB	World Bank
WHO	World Health Organisation
YCDC	Yangon City Development Committee

PART I
ANALYSIS OF THE CURRENT STATE OF ENVIRONMENTAL PRACTICE

1. INTRODUCTION

1.1 Background and overview of the assessment

Myanmar is rich in natural resources and has numerous opportunities for becoming a leading country in the field of sustainable development. The draft State of the Environment Report SOER (2015) underlines that pressures on natural resources and biodiversity are mounting, including conflicts over the use of resources. Problems related to pollution of air and water, waste management, coastal and marine management and land use need to be addressed. Furthermore adaptation to climate change, including disaster risk reduction, and opportunities for avoiding greenhouse gas emissions, are becoming an increasingly important part of the environmental policy of Myanmar.

The observed development and projections of future change emphasize the importance of environmental policies and governance that match the Constitution of the Republic of the Union of Myanmar (2008) and the National Sustainable Development Strategy (NSDS) of 2009. The Environmental Conservation Law (ECL) of 30 March 2012 provides a broad frame for the environmental legislation, but there are more than 60 sector laws related to environmental protection (draft SOER 2015). This underlines the importance of policy coherence and mainstreaming both at the level of written legislation and at the level of practice, including cooperation and good working relationships between authorities, the private sector and citizens.

In addition to the Ministry of Environmental Conservation and Forestry (MOECAF), several other Ministries and authorities have important tasks in relation to environmental conservation, depending on the subject matter. These include the Ministry of Industry, Ministry of National Planning and Economic Development (MNPED), Ministry of Mines, Ministry of Energy, Ministry of Labour, Ministry of Transport, Ministry of Agriculture and Irrigation, Ministry of Livestock, Fisheries and Rural Development, and the Ministry of Culture as well as regional bodies such as the City Development Committees of Yangon, Nay Pyi Taw and Mandalay. The National Environmental Conservation Committee (NECC) with members from 19 ministries and special task forces can function as a coordinating institution.

In Myanmar international co-operation can contribute to development in the environmental field. For cooperation between the Myanmar government and international development partners, the Environment Sector Working Group (ESWG) has recently been established with the objective of ensuring that sectoral strategies and priorities are elaborated and that identified priority programmes and initiatives are implemented with development partner support. The ESWG is chaired by the MOECAF with two co-chairs from the development partner community (one multilateral and one bilateral partner, in autumn 2015 UN-Habitat and Finland.[2] The ESWG has members from line ministries relevant to the environment sector, Civil Society Organizations (CSO) and INGOs.

The importance of focusing on implementation of the environmental legislation is recognized in Myanmar (draft SOER 2015). Desirable steps to be taken include action such as: (i) strengthening the Environmental Conservation Committees at national, regional and local levels; (ii) a fully staffed (and funded) MOECAF; (iii) promoting environmental awareness among people; (iv) using smart approaches to policy reform, such as combining voluntary, market and regulatory mechanisms; (v) consistent and coherent laws, regulations, sectoral policies and strategic plans; and (vi) improved environmental quality monitoring as well as enforcement of relevant laws and regulations. The draft SOER stresses that under the framework of the ECL, improved rules and regulations should be notified as soon as possible and that by-laws are essential for local implementation of the law. The

2 Norway acted as the bilateral co-chair until June 2015.

Environmental Conservation Department (ECD) plays a central role in the implementation of the ECL as outlined in Chapter IV of the ECL "Duties and Powers relating to the Environmental Conservation of the Ministry" and in other Chapters that identify specific roles for the Ministry in charge of the ECL. ECD has identified a general need to assess how Myanmar's Environmental Conservation Law can be effectively implemented and enforced. Finland, in close cooperation with UNDP Myanmar and in collaboration with other development partners, initiated the compilation of this report, which aims at identifying and compiling needs with particular reference to the effective implementation of the ECL.

The needs analysis has focused in particular on issues falling under the ECD's responsibility whilst acknowledging the wider context and links to other actors within the environmental sector in Myanmar. Therefore particular attention has been placed on the coordination among different ministries and other authorities at different levels of administration in environmental governance and management. The main objective has been to identify ways to improve the implementation and enforcement of the ECL, including priority areas for attention and action in the short- to medium term. The analysis has been structured around thematic areas of the regulatory framework arising from the ECL and the implementation capacities of the administration. The analysis also reflects the strategic priorities identified in the National Comprehensive Development Plan.

Based on the analysis, suggestions for the work plan of the ESWG are provided, including reflections on the timing and magnitude of the tasks. The recommendations focus on issues to be addressed in future projects and activities by Myanmar and the country's development partners. These issues include actions relating to policy design, development of legislation and other governance tools, capacity building and training, data and information management and environmental information services, demonstration and pilot projects.

The current study is closely linked with the work of UNDP Myanmar. The results support UNDP's assistance to the Myanmar in formulating a National Environmental Policy, Strategy Framework and Action Plan for 2016 to 2030.

The report is organised in two parts. Part I (chapters 2-5) analyses the existing situation and presents results of the gaps and needs assessment. Chapter 2 outlines the analytical approach used in the assessment. Chapter 3 provides an overview of the Environmental Conservation Law, including references to other relevant pieces of legislation and specific regulations for its implementation, as well as the main actors in Myanmar's environmental governance, including the private sector and civil society. Chapter 4 provides the main gap analysis based on the analytical framework and the collected data, along with specific recommendations for improving the implementation of the ECL in Myanmar. Chapter 5 presents an overview of current development partner support in the environment sector in Myanmar. In Part II of the report a roadmap for activities has been outlined based on the recommendations. The roadmap identifies steps towards more effective environmental governance and management in Myanmar and provides suggestions for DPs and the ESWG to consider in the coordination and implementation of activities.

The report is the result of a joint effort of Finland and UNDP Myanmar. The assessment team included experts from the Finnish Environment Institute SYKE (Dr Mikael Hildén (team leader), Mr Jorma Jantunen, Mr Mikko Jokinen, Mr Raimo Lilja, Ms Kirsi Mäkinen, Dr Salla Rantala) and local experts U Maung Maung Than and Daw Thiri Aung.

The team would like to extend its gratitude to all parties and individuals who supported the assessment process and development of the report. In particular, we acknowledge the support from the leadership and staff of the Environmental Conservation Department of MOECAF, the Ministry for Foreign Affairs of Finland and UNDP Myanmar, the Environment Sector Working Group including line ministries and international development partners, and representatives of civil society and private sector organisations. We would like to thank all parties for their invaluable support for this assessment, which would not have been possible without their generous inputs.

Table 1: Main economic activities in Myanmar

Pressure	Development trends and issues	Main concerns from the point of view of the ECL
Agriculture	Increasing large-scale farming, plantation agriculture and associated pressures for land use change	Potential pollution from use of pesticides and fertilizers, loss of biodiversity
Forestry	Increasing exploitation (legal and illegal logging), clearing of forest areas due to expansion of commercial agriculture, monoculture plantations (rubber, teak, eucalyptus) and infrastructure projects such as roads and hydropower dams	Loss of biodiversity, carbon sinks, forest stock
Mining	Strong land use changes in virgin rural areas, conflicts over land ownership and use	Pollution of rivers and destruction of landscapes, soil pollution, human health impacts
Oil and gas exploration and production	Increasing number of onshore and offshore areas	Pollutions caused by exploration processes and production fields Pollution caused by refineries (especially near coker ponds) Risk of emergency discharges (leakages, blow-outs etc.)
Industrial production	The share of industrial production, (other than mining, oil and gas but including construction material) in the GDP is gradually increasing. The food industry, wood processing and textile are the main industrial sectors. The regulation of the environmental impacts of industry has been weak.	Organic load and polluting substances in industrial wastewaters and the generation of hazardous wastes from the use of hazardous chemicals and substances are the main concerns. Poor knowledge of the quality of raw materials may cause a risk for the product quality and safety and risks for human health and environment.
Urbanisation and waste	About 30 % of the population of Myanmar lives in cities and urbanization can be expected to speed up dramatically. Sanitation, water safety and waste management are poorly developed. Yangon, Mandalay and Nay Pyi Taw are taking significant leaps in infrastructure development.	Uncontrolled population growth, poor land use planning and slum formation in big cities. Public health risks of poor sanitation, water safety and waste management. Rapidly increasing traffic congestion in the major cities is starting to cause air pollution problems. Lack of comprehensive urban planning (including land use and zoning).
Energy, hydropower	The final energy consumption and consumption of electricity per capita have increased, at the same time the energy intensity of the economy in relation to GDP has decreased. Significant needs in electrification remains, especially in rural areas.	Increased CO2 emissions and pollution from use of fossil fuels. Major energy infrastructure developments typically have strong impacts on nature and man and require EIAs. Major hydropower developments often cause significant social problems and loss of biodiversity.
Coastal exploitation (fish farming, capture fisheries)	Increasing fishing and fish industry, aquaculture and tourism activities	Loss of marine resources, loss of biodiversity, conflicts between different development projects
Road and other infrastructure construction	Changing land use, forest clearance	Loss of biodiversity, deterioration of housing environment, forest fragmentation

Table 2: Distribution Registered Private Industrial Enterprises by Commodity Group in Myanmar

No	Industry	Large	Medium	Small	Total	(%)
1.	Food and beverages	2856	4677	19580	27113	60.93
2.	Clothing and apparel	502	616	1140	2258	5.07
3.	Construction material	718	933	1980	3631	8.16
4.	Personal goods	507	456	361	1324	2.90
5.	Consumer goods	140	84	70	294	0.66
6.	Literature and arts	50	145	150	345	0.78
7.	Raw goods production	184	181	182	547	1.23
8.	Metal and mineral production	322	520	1510	2352	5.29
9.	Agriculture machinery	13	25	35	73	0.16
10.	Industrial tools/equipment production	22	35	38	95	0.21
11.	Automobiles	103	38	23	164	0.37
12.	Electrical equipment	55	18	26	99	0.22
13.	General	225	862	5114	6201	13.94
Source: Ministry of Industry (2015)						

1.2 Key environmental concerns and pressures in Myanmar

An examination of the draft SOER and other available sources reveals a number of environmentally significant pressures in Myanmar, both current and expected in the future (Table 1). The scope of the report does not cover the full range of these pressures, but they serve to give an overview of the overall context of environmental management in Myanmar. Available statistics show, for example, a decline in forest cover, an increasing ecological footprint per capita and increasing CO2 emissions per capita.3 There are connections between the development trends. For example recent forest cover changes have been attributed to development of dams and expansion of agriculture as shifting cultivation and oil palm plantations (http://burmariversnetwork.org/index.php/key-concerns/environmental-impacts, Leimgruber et al. 2005). Illegal logging is also recognised as a significant problem. According to reported estimates up to 48 percent of the total amount of exported timber (22.8 million m3) between 2000 and 2013 was felled illegally, without any government permission, while $5.7 billion worth of logs - or 72 percent of the trade - was smuggled across the border through illicit export deals.4

Industry

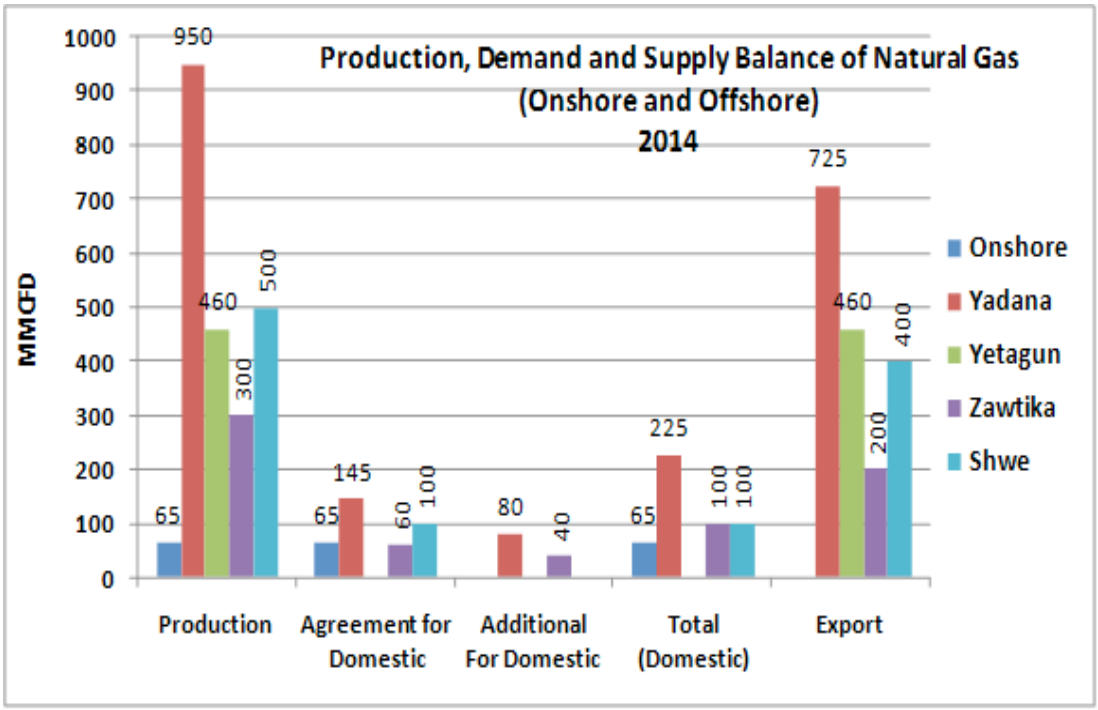
Since its shift to market-oriented policies in 1988/1989, the Myanmar Government has encouraged private sector participation and foreign investment in industry. The share of the industrial sector in GDP grew to 26% in 2010-11 from around 15 % in the 1990s. By 2010, a total of 25 enterprises invested nearly $20 billion in Myanmar; in agriculture (0.7%), mining (7.0%), oil and gas (50.9%), manufacturing (0.3%), and the power generating sector (41.1%). Other industrial products are textiles, foodstuffs, pharmaceuticals, ceramics, paper, chemicals, automobiles, agricultural machinery, machine tools and electrical appliances, and tires and other rubber products. Top exports in 2010 were gas (28.4%), agricultural products (13.6%), wood products (7.0%), and garments (4.3%) (ADB, 2012a).

There are around 45,000 registered private enterprises in Myanmar, of which 5000 can be called major enterprises. The combined value of the

3 http://www.gms-eoc.org/gms-statistics/myanmar

4 http://www.irrawaddy.org/burma/5-7bln-timber-smuggled-burma-illegal-logging-rampant-report.html (visited 26.8.2015)

Figure 1: Domestic gas supply plan in 2014 (draft SOER, 2015)



industrial products is currently less than USD 1 billion, contributing only 10% to the total exports or 20% of total private sector exports. This is because domestic consumption is the focus of Myanmar industries. Registered Private Industrial Enterprises are included in the categories listed in Table 2. The food and beverages industry accounts for the largest number of Private Industrial Enterprises (60.93% in June 2015).

State-owned enterprises under the Ministry of Industry (MOI) constitute a significant share of the industrial production capacity in Myanmar. Several phases of privatization and reorganization have taken place. About 170 enterprises have transitioned from state-owned to private firms since 1995 (Kyaw Phone Kyaw 2015). In the fiscal year 2012-2013 the oil, gas and mining sector state-owned enterprises accounted for 28% of all public revenues and 15% of public expenditures.

The state-owned oil company and mining companies have been criticized for poor transparency (Natural Resource Governance Institute 2015). In April 2015, three state-owned heavy industry enterprises (groups of industries) were reorganized into about 30 subsidiaries representing different types of heavy industries from steel mills to rubber and electric tools. In addition the MOI supervises the state-owned company for pharmaceutical industries.[5]

There are 18 privately-operated industrial zones across the country, contributing about 4.8% of the country's GDP according to the plan 2015-2016. Three key Special Economic Zone (SEZ) projects have recently been under development in Myanmar:

1. Dawei Special Economic Zone in the Special Economic Zones / Industrial Zones southern Taninthayi region, with Thai investors.
2. Kyaukphyu Economic and Technology Zone in the western Rakhine state, with investment from China.
3. Thilawa Special Economic Zone near Yangon, with assistance from Japan.

Myanmar is also planning to set up seven local industrial zones in addition to the 18 already existing. New industrial zones have so far been announced for Tatkon in Nay Pyi Taw, Yadanarbon in Mandalay, Hpa-an, Myawaddy and Phayathonzu in Kayin state, Ponnagyun in Rakhine state and Namoum in Shan state (KPMG, 2013). SEZs are potentially important for the implementation of the ECL, because they are coherent areas where

5 www.industry.gov.mm/en

government has good possibilities to consistently apply environmental policy with several companies and request advanced technical solutions and standards e.g. for wastewater and solid waste management and other pollution control. At the same time the linked nature of the activities in the SEZs pose challenges for the implementation of the ECL.

Oil and gas production

Oil and gas production is rapidly expanding and is becoming increasingly important in certain offshore, coastal and onshore areas. The sector is serving both domestic use and export (Figure 1).

The three existing refineries with a total commissioning capacity of 51 000 barrels per stream day (BPSD) need to be upgraded as these cannot handle the large crude oil production in the country. A new refinery project with a capacity of 50,000 BPSD is under way to process crude oil from the Myanmar-China pipeline. The crude oil pipeline network stretches 119 km across the country and the onshore gas pipelines cover 4 254 km.

Urbanization, sanitation and municipal waste

Provisional results of the National Census 2014 showed a total population of 51.4 million in Myanmar. The most populated areas are Yangon Region with 14.3% of the population, Ayeyarwady Region with 12% and Mandalay Region with 12% of the population. The urban population was estimated at 14.8 million, representing 29.6% of the total population. Yangon Region is the most urbanized with 70.1% people living in urban areas, followed by Kachin State with 36%. The majority of Myanmar citizens still live in rural areas but that is likely to change at a rapid pace and on a large scale (McKinsey Global Institute, 2013). With the current national population growth rate at around 1.1%, the urban population growth rate is around 2.5 times higher than the national population growth rate (draft SOER, 2015).

The urban sector is dominated by two of its largest cities, Yangon and Mandalay. After the third largest city of Mawlamyine, city size falls off rapidly with only 31 urban centres with a population over 100,000. As a consequence of relocation in the

Waste Disposed by Cement Factory by the side of Dote Htar Wady River Bank. *Environmental Conservation Department*

1960s and early 1990s large parts of Yangon and Mandalay consist of resettlement areas, with an estimated population in the hundreds of thousands. In these areas urban services are frequently below acceptable levels; for example, the quality of the water supply is poor and there is no functioning drainage network or sewerage in the area. (ADB, 2012b)

Official statistics indicate that Myanmar has performed well on achieving the water and sanitation targets of the Millennium Development Goals. For instance, access to improved drinking water stands at 83% (urban: 93%, rural 78%) and to improved sanitation at 76% (urban 83%, rural 73%). However, piped water supply systems in Yangon and Mandalay distribute untreated surface water from open reservoirs, which may not be considered an improved water source. The quality of water used by households is uncertain and unlikely to meet international bacteriological guidelines for drinking water. Arsenic is found in groundwater of the Ayeryawaddy delta and sometimes in the surface water of the lower reaches of the Sittaung River. Urban areas do not have functioning city-wide sewerage and drainage networks. With the exception of a small piped sewerage system in the old business district of Yangon, there is no systematic collection and treatment of domestic wastewater. Most households in formal residential areas have

some form of septic tank, but these are not routinely serviced, and proper treatment of the sludge from septic tanks is unclear. Informal settlements depend primarily on improvised latrines. (ADB, 2012b)

Solid waste is collected in cities, but the collection and disposal process involves intermediate street-corner depots and considerable manual handling. Significant informal recycling takes place in city areas and through scavenging at intermediate depots and dump sites. Residual waste is deposited in open dump sites. Waste often ends up in open drains, leading to stagnant wastewater and thus increasing e.g. breeding opportunities for mosquitoes. Inadequate environmental infrastructure, combined with underinvestment in medical care, has contributed to severe health threats across the country. In 2010, the mortality rate of children under 5 years old (48,485 per 1,000 live births) was higher than elsewhere in Southeast Asia (UNICEF, 2013).

Municipal solid waste in Myanmar consists of organic waste (73%), paper and cardboard (18%), wood (4%), plastic (2%), textile (2%), and other materials (1%); About 22% of the municipal solid waste in Myanmar is recyclable; remaining waste is managed using open dumping (73%), incineration (0.7%), composting (1.3%), and other methods (3%) (draft SOER 2015).

Rapid urbanisation will put stress on land use and green spaces. *Environmental Conservation Department*

2. ANALYTICAL APPROACH AND MATERIAL

2.1 Scope of the analysis

The scope of the analysis is based on the ECL with special reference to the different mandates of the ECD as defined by the regulations issued under the ECL article 7 and the Environmental Rules (ER) article 23-26, 34, 39, 40 b, 45-47,60, 72 and 73. The duties of the ECD mainly focus on drafting policies, preparing national and regional work plans, setting environmental standards, monitoring the state of the environment and inspecting compliance in accordance with the regulation based on the Notification No. 50 / 2014.

The analysis has been set in a wider frame of environmental management in Myanmar and makes references to the role of the ECD in relation to other authorities and relevant pieces of legislation. Special reference is made to the main environmental concerns Myanmar identified in the latest Environmental Performance Assessment Report (ADB-GMS 2012). These include:

- degradation of forest resources
- threats to biodiversity, including development in agriculture
- land degradation
- water resources and water pollution
- solid waste management
- air pollution in cities mainly due to vehicle emissions
- climate change
- impacts of mining on the environment.

Industrial pollution and environmental risks caused by the use and disposal of toxic chemicals are other emerging environmental concerns which have been included in the scope. The three first concerns in the list above are not in the main focus of this analysis, because they are not primary areas for the tasks of the ECD but other Departments. The ECL provides rather limited mechanisms for dealing with these environmental issues.

2.2 Framework for the analysis

The gap-analysis is based on a framework that identifies key elements affecting the implementation of environmental regulation. The framework is used to identify both strengths and important gaps and challenges in the practical implementation of the environmental conservation law environmental policies in Myanmar (Figure 2). Elements in the regulatory base, the governance practice, capacities and resources, cross-cutting objectives and ongoing activities and future needs were systematically examined using a set of questions that guided the discussions with authorities and other experts, including those representing or carrying out development cooperation projects in Myanmar.

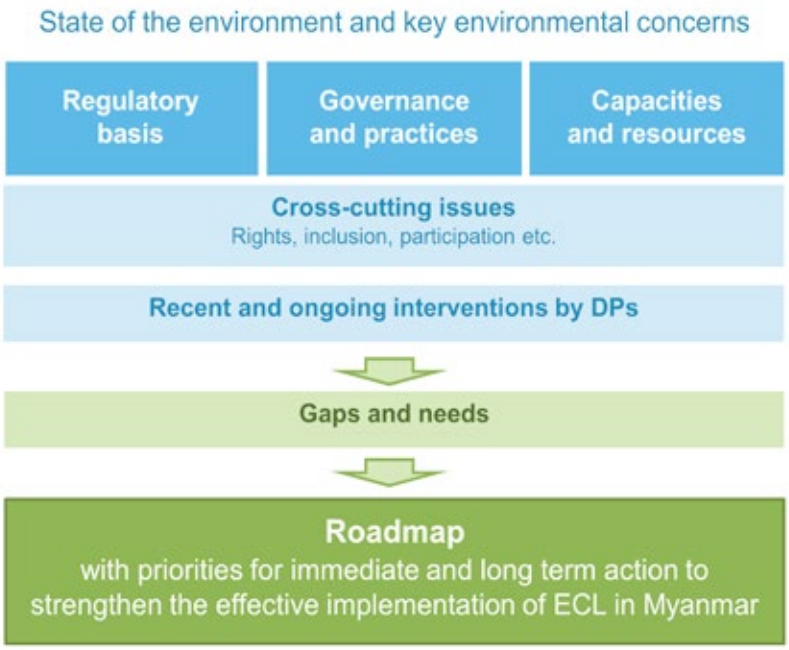
Regulatory base:

- How the area has been addressed in the ECL and environmental rules.
- System and practice for licensing, permitting, monitoring (ECL, references also to other relevant pieces of legislation).
- Links to other legislation and sectoral policies / strategies; possible overlaps or contradictions between them.
- Tools for management and implementation (guidelines etc.).
- International agreements (which ones, status of adoption).
- Existing gaps in legislation and tools for its implementation and related development needs.

Governance:

- Responsible/competent authorities and other key actors (both governmental and non-governmental), their roles (also competing, parallel or otherwise unclear), formal mandates and practice in performing the duties, including the identification of de facto influence in decisions affecting the environment. The assessment

Figure 2: General framework for the analysis



covers both formal institutions as well as the actual practices of implementation.

- Division of legislative and executive powers as well as roles and responsibilities across the various administrative levels, particularly the national and region/state administrations.
- Participation and accountability: mechanisms for stakeholder engagement and their status (e.g. if implemented or not, how practices differ from formal mechanisms, level of stakeholders' influence on decisions), how well these authorities give access to information and are transparent in their administrative processes; how well right-holders are aware of their rights and demand them (how well ECL and related policies/strategies are understood). Capacity to govern and control (minimise illegal and informal activities).

Capacities and resources:

- Existing capacities, resources and competences of key actors (capacities incl. financial and human resources, skills, access to information etc.) to fulfil their functions and competences.
- Specifically, regarding financial resources: allocations from the national budget towards the implementation of environmental management.
- Gaps and needs for capacity development.
- Ability of officials to respond to the arising needs; flexibility in the organization to upgrade its capacities where it is most needed.
- Anticipated donor funding for the topic.

Cross-cutting objectives:

- Cross-cutting objectives include gender equality, reduction of inequality and climate sustainability.
- Integration and treatment of such cross-cutting issues in the ECL and its implementation are assessed in line with the human rights based approach (HRBA) to development, with focus on evidence to what extent and how principles embodied in the HRBA (e.g. participation, and inclusion, transparency and accountability) are reflected in the regulatory framework and its implementation in relation to the cross-cutting objectives.
- Focus is on the capacities that the duty-bearers have in regards to the ECL in fulfilling their obligations. The ability of the right-holders to defend their rights and demand for them are also addressed.
- Attention is paid to the recognition of gender equality issues and identification of ways to reduce inequality, to promote the rights of vulnerable groups, and equity in the sharing of benefits and/or environmental burdens.

- Climate change is mainly treated as an environmental sub-sector, but cross-cutting aspects relating to climate sustainability are considered where relevant in relation to other topical areas; given that climate change is a broader development challenge than just an environmental concern with linkages to Myanmar's comprehensive national development plan.
- Good governance (transparency and accountability) is one of the cross-cutting objectives considered in the analysis; the Extractive Industries Transparency Initiative (EITI) has been used as one important reference.

Ongoing activities and future needs

- Key problems identified from an implementation / management perspective and by whom.
- Current status (in progress, under development, future issue/too early…) and why.
- Involvement and interest of DPs.
- Government's comprehensive national development plan and specific priorities related to environmental sustainability.
- Opportunities for preparing national or regional work plans on environmental management.
- Opportunities for setting up financial mechanisms, such as Polluter Pays Principle (PPP), Payment for Ecosystem Services (PES), and the Environmental Management Fund (EMF) stated in the ECL.

2.3 Data collection

The data was collected by examining publicly available documents, carrying out interviews with experts and responsible persons and by organising one workshop with civil society organisations (CSO) and another for private sector stakeholders. All meetings were documented, but for the purpose of the report the anonymity of individual persons providing information has been respected. Appendix 1 includes a list of meetings and visits organised during the data collection period in Myanmar in April-May 2015. Documents reviewed in the assessment are referred to throughout the report and collected in the list of references to this report.

The stakeholder workshops were organised in the form of facilitated discussions structured around a set of questions specifically designed for the stakeholder group in question. The questions discussed and main outcomes of the discussions of each workshop are provided in Appendix 2.

The draft report was circulated for consultation government, development partners, CSOs and private sector stakeholders in July 2015. Feedback from the consultation was used in finalisation of the report, together with input provided by participants of a final workshop organised in Nay Pyi Taw on 11 September 2015 for government stakeholders and development partners to discuss the recommendations included in Part II of the report (roadmap).

Participants at the workshop on discussion for needs assessment for effective implementation of Environmental Conservation Law, jointly organized by Ministry for Environmental Conservation and Forestry, Ministry of Foreign Affairs of Finland and United Nations Development Programme. *Environmental Conservation Department*

3. ENVIRONMENTAL GOVERNANCE IN MYANMAR

Chapter 3 provides a general overview of the environmental governance in Myanmar and how the different pieces of legislation and the actors relate to one another, including information on actors, tasks, mandates, responsibilities and resources. Particular reference is made to the ECL and the roles of the ECD in its implementation.

3.1 Governance structures and decentralization

Myanmar is undergoing profound changes: from military rule to a system of democratic governance since the 2010 elections; from centrally planned to a market economy; and from conflict-ridden to a more unified country under the peacebuilding process (Hendrix and Noland, 2015; Jones, 2014). Catalysing the country's return to the international community, these change processes have spurred efforts to increase international aid as well as trade and investment (Webb et al., 2014). Their impacts play out as dynamic changes in the governance system, and place various requirements on the effectiveness of the environmental administration.

The Republic of the Union of Myanmar comprises seven regions and seven states, as well as six 'self-administered areas' and the capital Nay Pyi Taw under the direct administration of the Union government. Legislative power is shared between the bicameral Pyidaungsu Hluttaw at the union level, and unicameral state and region Hluttaws. The Hluttaws (assemblies) are made up of elected civilian members and representatives of the Defence Services nominated by the Commander-in-Chief, the latter comprising up to 25% of Pyidaungsu Hluttaw and one third in the state and region Hluttaws. The civilian representatives in each state and region Hluttaw are elected to represent different townships as well as the main ethnic groups (Constitution, 2008).

The states and regions comprise districts, further divided into townships, and finally, at the local level, wards in the urban areas and village tracts in rural areas. Village tracts consist of groupings of villages. The formal link in the coordination between the various levels of governance is the General Administration Department (GAD) of the Ministry of Home Affairs, involving a hierarchy of administrators at all levels (Kyi Pyar Chit Saw and Arnold, 2014).

The state and region Hluttaws may pass legislation as regards certain narrowly defined sectors in Schedule 2 of the Constitution (2008). State/region departments in those sectors are headed by a cabinet of ministers, led by a Chief Minister, and do not fully match with the sectoral ministries at the union level. The Constitution (2008) does not seem to grant legislative powers over the environment and natural resources to the state and region levels, since these are not mentioned in Schedule 2.

The accountability relationships between the state and region departments, the union sectoral ministries and the Hluttaws are still unclear, and in practice governance remains centralized. The Chief Ministers are appointed by and accountable to the Union President. In terms of fiscal decentralization, the state and region budget allocation remained 7.6 % of public spending in 2013-2014, and their control over budget composition and priorities is limited and subjected to the Union Financial Commission review (Nixon et al., 2013). Despite the establishment of various local level committees to facilitate bottom-up planning since 2013, strong intra-sectoral hierarchies and upward accountability (each civil servant being only accountable to their immediate supervisors) constrain the adjustment of departmental plans to the local needs and priorities, or to the plans of other departments (UNDP Myanmar, 2015a). Most states and regions have thus far passed very few laws dealing with local issues. However, the state and region Hluttaws have opened up new spaces for public debate, and the civil society and local media are increasingly participating in the discussion on local governance (Nixon et al., 2013).

Advancing democratic, administrative and fiscal decentralization largely depends on the possibilities to amend the 2008 Constitution, a key issue for the democratization process in Myanmar (Nixon et al., 2013; Patel et al., 2014). The constitutional constraints are also seen as an impediment to lasting outcomes in the peace-building process, since the current legal decentralization framework does not provide for the kind of political and economic autonomy that the armed groups in conflict or cease-fire with the government pursue (Nixon et al., 2013). In June 2015, the most recent proposals to amend the Constitution failed to pass in the Pyidaungsu Hluttaw.

3.2 Environmental Conservation Law and the environmental authorities

3.2.1 Overview of the ECL

The objectives of the ECL include the systematic integration of environmental conservation in the sustainable development process; a healthy and clean environment and the conservation of natural and cultural heritage for the benefit of present and future generations. It is also intended to provide a legal base for the restoration and protection of specific ecosystems, the sustainable management of natural resources, international cooperation as well as the promotion of public awareness and cooperation in educational programmes for dissemination of environmental perception (ECL article 3).

Most of the law deals with the powers and duties of the National Environmental Conservation Committee (NECC) and the Ministry (MOECAF). They are given the key role in laying down and carrying out national environmental policies, setting environmental standards, carrying out environmental and social impact assessment and environmental permitting, monitoring and enforcing pollution control, facilitating the settling of environmental disputes, implementing international environmental agreements and establishing financial mechanisms for environmental management.

The ECL is a framework law enabling coordination between Government departments, Government organizations, international organizations, non-government organizations and individuals in matters of environmental conservation. The chapters on the management of urban environment (chapter VIII) and conservation of natural resources and cultural heritage provide MOECAF with an advisory or complementary role with other authorities carrying the main responsibility for regulation and implementation.

The duties of stakeholders that undertake activities carrying a risk of negative environmental impacts are defined in the ECL (articles 14-16, 22, 26, 28-30). Similar to the ECL the Environmental Rules deal mostly with the duties of the authorities. Rules concerning the proponents of activities are laid down in rule 56, 63, 67, 68 and 69.

The powers and duties of the Ministry have been stipulated in ECL and further elaborated in the Environmental Rules (ER, Notification No. 50/2014). In many cases the Ministry will need the approval of the NECC or in some cases the Union Government to approve its stipulations. Within the ministry, the powers have been partly delegated to the Environmental Conservation Department (ECD) as stipulated in the Environmental Rules (rules 23-26, 32-34, 39-40, 42c, 44-49, 51, 60, 66, 68). The rules also recognize the Region or State ECD that may execute some of the duties of the central ECD.

A detailed table of the powers and duties the NECC, MOECAF and ECD in the implementation of ECL is presented in Appendix 3. The duties can be grouped into categories that reflect different types of activities. In many activities the formal decision making power is mainly with NECC or MOECAF, but the preparatory and implementing duties are carried out by the ECD. The mixture of different types of tasks in the ECL makes it challenging to determine the actual role of MOECAF and the ECD. As the ECL is recent it has not yet become fully operational and the relationship between different authorities as well as the relationship between older legislation and the ECL is still in a flux. Thus for example tasks related to planning and coordination are distributed between different units in MOECAF and the ECD.

A. Planning and coordination with sector authorities

- Laying down environmental policies, implementing them through national or regional work plans and monitoring their performance.
- Coordinating environmental management with sector authorities especially in relation to natural resources use, cultural heritage.
- Providing technologies for the conservation of natural resources and cultural heritage.
- Negotiating and implementing international agreements.
- Advising relevant stakeholders in urban environmental management.
- Supervising sector authorities to prevent environmental damage.

B. Control of pollution and other environmental impacts

- Establishment and administration of the environmental impact assessment and environmental permitting system (EIA, prior permission and Environmental Management Plan, EMP). The impact assessment includes social impact assessment (SIA).
- Setting environmental norms for emissions, wastes. Regulation of import, export, production, transport and trade of hazardous substances.
- Compliance monitoring of polluting activities in particular for industry.
- Environmental complaints settlement.
- Promoting the establishment of necessary treatment facilities for wastes and emissions.

C. Management of environmental emergencies

- Proposing the declaration of an environmental emergency
- Environmental emergency preparedness planning.
- Contributing to environmental emergency response.

D. Dissemination of environmental awareness

- Compiling and collecting environmental data and disseminating the results, e.g. in the State of Environment Report and by other means of environmental awareness activities.
- Carrying out organizational education and contributing to environmental education in schools.

E. Establishing economic instruments and financing environmental management

- Establishment of an Environmental Management Fund that can be used to finance environmental management, including the EIA review system.
- Introducing polluter pays system and compensation system for ecosystem services and natural resource use.
- Contribute to the establishment of an environmental insurance system.

Figure 3: Different roles of the ECD in the implementation of the ECL

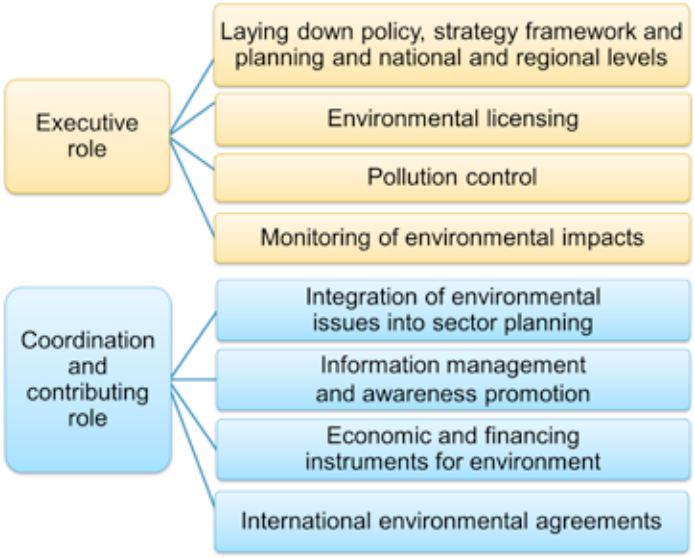


Figure 4: Organisational structure of MOECAF, June 2015

F. Enforcement and sanctions

- Establishment of a system of administrative fines.
- Causing the revoking or suspension of operating licenses together with sector authorities.
- Interacting with criminal courts for issuing sanctions on environmental offences.

The tasks of the ECD can be categorised into two basic types - executive and coordination and contribution role (Figure 3) - which reflect the different roles that the ECD plays in relation to other authorities. The coordinating and contributing role is dependent on the success of mainstreaming environmental concerns into regulations and practices of other sectors and line ministries.

3.2.2 Organization of Environmental Conservation Committees, MOECAF and ECD

The National Environmental Conservation Committee (NECC) has a coordinating role, but it appears still to be in a formative stage. There are no easily accessible records of its members, minutes of its meetings or decisions that it has taken. For implementing its coordination role NECC has established five task forces:

a. Special Task Force on Land Use
b. Special Task Force on Rivers, Streams and Wetlands
c. Special Task Force on Industrial Projects, Large Industries and Urban and Rural Area
d. Special Task Force on Environmental Policy, Law and Procedures
e. Special Task Force on Environmental Education and Awareness.

In addition a Special Task Force on Climate Change is foreseen in the National Comprehensive Development Project in Environmental Conservation Sector.

With Notification No. 22/2014, the Union Government Office has given an order to form Region, State and Nay Pyi Taw Council level Regional Environmental Conservation and Supervising Committees. At the time of the information gathered for this report (spring/summer 2015) they were still in a formative stage. The Committees will be chaired by a Council member nominated by the Regional/State Government and the members will be nominated from sector ministries and from some CSO representatives. The regional ECD head will act as the secretary of the committee. The tasks of the committee include:

a. Implementing Environmental Impact Assessment not to cause environmental impacts by the development activities and to establish comprehensive monitoring for environmental conservation
b. Supervising climate change mitigation and adaptation activities and coordination between relevant government department and organizations
c. Formulations of plans for conservation of natural resources and cultural heritages
d. Issuing directives and supervising activities towards prevention of loss of natural resources and sustainable effective use of them
e. Formulation and implementation of plans and directives for sustainability and efficiency of energy use
f. Supervision of environmental statistics and database

Figure 5: Organisational structure of ECD, June 2015

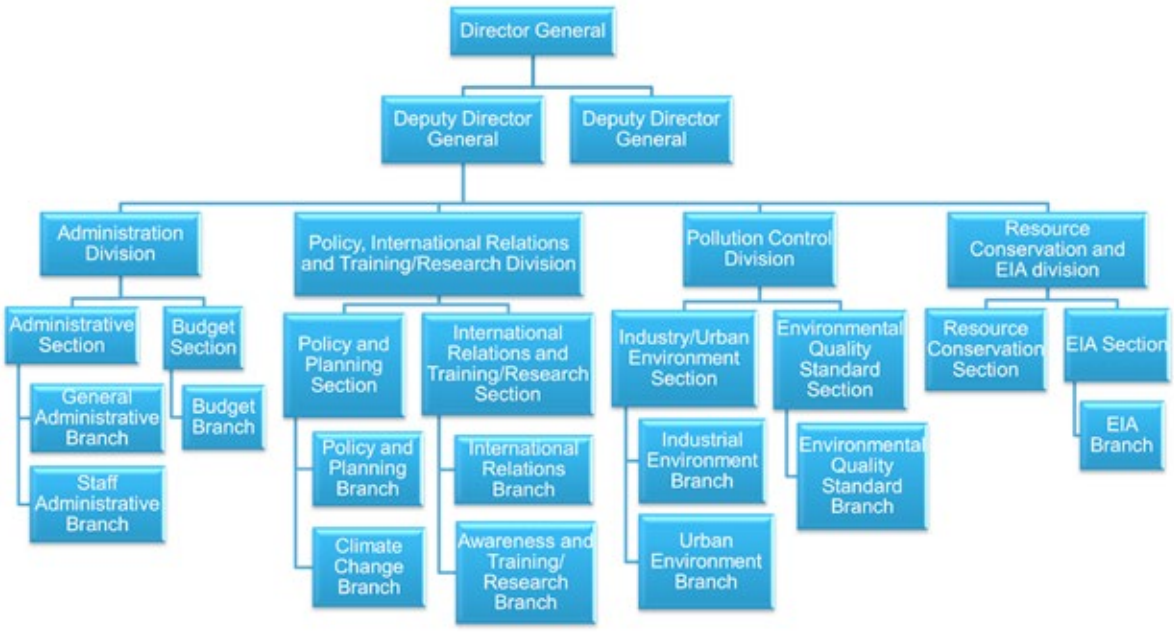


Table 3: Staff numbers in ECD in May 2015

	Union (Central) level			State and Region level (excluding central government)		
	Planned Strength	Appointed	Vacant	Planned Strength	Appointed	Vacant
Senior staff/ experts	157	83	74	107	48	59
Supporting staff	247	175	72	182	119	63
Total	404	258	146	289	167	122

g. Supervision of environmental management of urban, rural, industrial zone and special economic zones
h. Supervision of systematic control of waste
i. Coordination between relevant government bodies and organizations on environmental disputes
j. Inspection and taking action on environmental complaints and if necessary reporting to the Environmental Conservation Committee.

The regional and State level environmental committees have recently been established. For example in Yangon Region the committee has focused on environmental dispute resolution in its monthly meetings. The role and powers of the committees relative to those of the officials of the ECD are likely to arise as an issue to be clarified. There is a need to evaluate the work of the existing committees to develop and disseminate good practice,

The legislative and executive powers concerning the environment and natural resources are vested in the union government (Constitution, 2008). The focal ministry for environmental management in Myanmar is the Ministry of Environmental Conservation and Forestry (MOECAF), reformed in 2012 to replace the former Ministry of Forestry. In addition to the Environmental Conservation Department (ECD), other MOECAF departments such as the Forest Department have significant roles in the conservation of natural resources. The organisational structure of MOECAF reflects its key areas (Forest, Dry Zone Greening, Planning and Statistics, Survey, Myanmar Timber Enterprise) (Figure

4). The Timber Enterprise carries out commercial activities whereas the Forest Department develops policies and maintains public activities.

Much of the capacity in MOECAF rests within the Forest Department. When the Environmental Conservation Department was formed on 26th January 2012, it was allocated 156 officer posts and 247 staff posts, totally 403 posts under the Ministry of Environmental Conservation and Forestry (Figure 5). This includes the staff of the Region and State level ECDs. This level of staffing has not yet been realized and of officer level staff, nearly half of the vacancies have not yet been filled (The Region and State level ECDs operate under the Regional/ State Government with some variations in position depending on the exact administrative setup. They have formally two divisions:) and thus the ECD operates well below its expected capacity. The budget of ECD was 596 million kyats of current budget, 1380 million kyats of capital budget and totally 1976 million kyats for the 2013-2014 financial year (National Comprehensive Development Project in Environmental Conservation Sector from 2011-2012 to 2030-2031).

The Region and State level ECDs operate under the Regional/State Government with some variations in position depending on the exact administrative setup. They have formally two divisions:

a. Administrative and Training/ Research Division
b. Environment and Resources Conservation Division.

3.3 Other authorities and regulations with important environmental implications

There are over 60 sectoral laws and rules that have environmental provisions (draft SOER 2015). Some of them are relatively old such as the Public Health Law (1972), Private Industrial Enterprise Law 10/1990, Fresh Water Fisheries law 9/1990, the Mines Law (1994) and the Forest Law (1992). Many of them are under revision, for example the Mines law and rules are being modernized and the objectives of the ECL (such as the EIA requirements) will be integrated in the new law and rules (interview with MOM, 30.4.2015). Some are recently enacted such as the Conservation of Water Resources and Rivers Law (2006), Lands Management Law (1/2012), the Prevention of Hazard from Chemical and Related Substances Law (28/2013) and the Chemical Law 28/2012. Based on these laws the Ministry of Industry, Ministry of Mines, Ministry of Agriculture and Irrigation and other sector ministries play an important role in implementing the conservation of natural resources and prevention of pollution within their own mandates. (Chandler, 2014).

The common practice in Myanmar of establishing Committees or Supervisory Boards to coordinate the implementation of laws provides an opportunity for MOECAF/ECD to be informed and to promote the environmental aspects in the implementation of these laws.

Legislation and the procedures established by different authorities for the licensing of industrial and other major development projects provide the crucial point of intervention for incorporating environmental aspects in the planning, implementation and monitoring of these activities. One important licensing process is administered by the Myanmar Investment Commission (MIC) based on the Foreign Investment Law (FIL 2012) and Foreign Investment Rules (FIL Rules 2013). The law states that businesses that can cause damage to the natural environment and ecosystems or businesses that produce hazardous chemicals banned by international agreements or businesses that import hazardous wastes to the Union are restricted or banned (section 4 of the Foreign Investment Law). The Commission may allow by the approval of the Union Government, the restricted or prohibited investments under section 4 for the interest of the Union and citizens especially people of national races (section 5 of the Foreign Investment Law). The Foreign Investment rules dictate that businesses that require an EIA must submit the EIA and SIA report together with the investment proposal (Foreign Investment Rules article 34). MIC has notified the types of businesses requiring an IEE or EIA (MIC Notification 50/2014 of August 2014 sets out a list of 'Economic activities which require Environmental Impact Assessment'). MIC can thus in in principle raise the key environmental concerns in

investments. The role and responsibilities of both MIC and the Directorate of Investment and Company Administration (DICA) are likely to change when the EIA procedures are fully operational.

Proposals that are natural resource-based investment businesses and investments under the State-owned Economic Enterprises Law, shall be submitted to the Commission through the relevant Union Ministry (FIL Rules article 36). DICA under the Ministry of National Planning and Economic Development (MNPED) is responsible for the implementation of the investment legislation.

All notable investments have to be submitted to the MIC as a condition for enjoying certain tax benefits and import/export exemptions, to bring in and repatriate capital, and to potentially access longer land leases. The Commission has formed a Proposal Assessment Team (PAT) to scrutinize the proposals with the senior officials from ten different authorities including ECD. The applicant is informed of all required permitting procedures, among them the EIA procedure (so called one-window system). The project proponent is invited in the PAT meeting. Comments will be requested from the Nay Pyi Taw Council or relevant Region or State Government whether the proposal is acceptable or not and recommendations for the measures to protect or minimize the environmental and social impacts will be requested from the Ministry of Environmental Conservation and Forestry (FIL Rules 43). MOECAF and the Regional/State authority are obliged to reply within seven days (FIL Rules articles 44-45). After receiving the required recommendations from sector authorities (FIL Rules article 46), the MIC will scrutinize the documents and take a decision of approval or rejection of the application will be decided by the Commission (FIL rules articles 48-49). The project proponent then has to complete the sector specific permitting and registration procedures (FIL Rules article 54). The Myanmar Special Economic Zone Law (1/2014) Chapter 5 specifies that issues related to environmental protection are integrated and coordinated. Specifically MOECAF has a say in considering the need for an EIA. This may assist in achieving smooth an effective environmental permitting.

Directorate of Industrial Collaboration (DIC) coordinates the activities of the enterprises under the Ministry of Industry in accordance with the directions and guidelines of the Ministry. It also negotiates with foreign and local organizations for new projects, acts as representative of Ministry in the activities related to ASEAN and International Organizations. There are six regional industrial training centres under the supervision of the DIC. (www.industry.gov.mm/en)

The sector ministries: the Ministry of Mines, Ministry of Industry and Ministry of Energy Ministry of Hotels and Tourism, Ministry of Construction, Ministry of Electric Power, Ministry of Agriculture and Irrigation, Ministry of Livestock, Fisheries & Rural Development, Ministry of Communications and Information Technology, Ministry of Environmental Conservation and Forestry, Ministry of Transport, Ministry of Rail Transportation, Ministry of Commerce, Ministry of Finance and Central Bank of Myanmar have roles in licensing or registering the activities under their mandate. The Central Supervisory Board, which is formed by the Central Leading Board, has a central role in the application of license and registration certificate of the Chemical and Related Substances Business by the chemical law (Prevention of Hazard from Chemical and Related Substances Law. No.28/2013, Chapter 7 and 8). Ministry of Health regulates the prevention and control of the impacts of pollution on public health, such as drinking water safety. Ministry of Agriculture and Irrigation regulates the product safety of agrochemicals and promotes the safe use of these products (Fertilizer Law No.7/2002).

No single institution is responsible for the overall management of Myanmar's water resources. Currently, the Ministry of Agriculture and Irrigation is the main ministry involved in water resources, with the mandate to develop agriculture and irrigation, but also the Ministry of Transport plays a role with its Department of Meteorology and Hydrology and the Directorate of water resources and improvement of river systems. In the Ministry of Agriculture departments include Water Resources Utilization (responsible for groundwater), Irrigation, Department of Agriculture land management and statistics (DALMS), and Agricultural Planning. Indirectly, the Ministry of Agriculture and Irrigation plays an important role in rural water supply through its

Table 4: List of international conventions and agreements relevant for ECD and implementation of ECL

Theme	Convention/treaty/agreement	Status*	Focal point
	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification (UNCCD), Paris, 1994	Accession (1997)	MOECAF/FD
Air and climate change	United Nations Framework Convention on Climate Change (UNFCCC), New York, 1992	Ratification	MOECAF/ECD, MOT/DMH
	Kyoto Protocol to the Convention on Climate Change, Kyoto, 1997	Accession (2003)	MOECAF/ECD
	Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985	Ratification (1993)	MOECAF/ECD
	Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987 + amendments	Ratification (1993, 2012 for recent amendments)	MOECAF/ECD
	ASEAN Agreement on Transboundary Haze Pollution, Kuala Lumpur, 2002	Ratification (2003)	MOECAF
Pollution control	Stockholm Convention on Persistent Organic Pollutants (POPs), Stockholm, 2001	Accession (2004)	MOECAF/ECD
	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Basel, 1989	Accession (2015)	MOECAF/ECD
	International Convention for the Prevention of Pollution from Ships (MARPOL), London, 1973 + amendments in 1978	Accession 4/8/1988	MOT
Biodiversity and natural resources	Convention on Biological Diversity (CBD), Rio de Janeiro, 1992	Ratification (1994)	MOECAF/ECD
	Cartagena Protocol on Biosafety to the CBD, Cartagena, 2000	Ratification (2008)	MOECAF, MOAI
	Nagoya Protocol on Access and Benefit Sharing (ABS) to the CBD, Nagoya, 2010	Accession (2014)	
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington, D.C., 1973 + amendments (1979 Bonn, Germany)	Accession (1997)	MOECAF/FD
	Agreement on Establishment of ASEAN Regional Centre for Biodiversity	Ratification (2009)	MOECAF/FD
	ASEAN Agreement on the Conservation of Nature and Nature Resources, Kuala Lumpur, 1985	Signatory (1997)	MOFA
	Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 + amendments in 1982 and 1987	Accession (2004)	MOECAF/FD
Cultural heritage	The Convention for the Protection of the World Culture and Natural Heritage, Paris, 1972	Acceptance (1994)	MOC
	Declaration on ASEAN Heritage Parks	Signatory (2003)	MOECAF/FD

*) All of the terms (Ratification, Accession, Approval and Acceptance) signify the consent of a state to be bound by a treaty and consequently their legal implications are the same. All countries that have either ratified, acceded to, approved or accepted a treaty are therefore Parties to it and legally bound by it. (The primary distinction is only between ratification and accession, as only states which have signed a treaty when it was open for signature, can proceed to ratify it. Afterwards, states which have not signed a treaty during the time when it is open for signature can only accede to it. The terms “acceptance” and “approval” are of more recent origin and apply under the same conditions as those that apply to ratification. The uses of these terms have to do with the diversity of legal systems.)

Awareness Raising on Environmental Education in Mandalay Region by Environmental Conservation Department, Ministry of Environmental Conservation and Forestry. *Environmental Conservation Department*

responsibility for groundwater resources. In the three largest cities, water supply and sewage treatment is the responsibility of the respective city development committees. In smaller peri-urban centres, the Department of Development Affairs (DDA) is responsible for water supply and sanitation (ADB, 2013). In addition there is the National Water Resource Committee formulated by President Office Order Letter/No 65/2013, and headed by Vice President.

In urban environmental management the city development committees have a high degree of independence, especially in the Yangon, Mandalay and Nay Pyi Taw cities. Pollution Control and Cleansing Departments (PCCDs) are tasked with solid waste management within their municipal areas. In smaller towns the responsibility of providing technical services relies on Township Development Committees (285 of them) but the responsibility is shared with the Regional or State level government. At the central level the Ministry of Construction is responsible for urban land use planning policy and supervision.

3.4 Relevant international environmental agreements

Myanmar is party to a number of international environmental agreements. The task as a national focal point varies depending on the convention and agreement. For most of the international agreements in the environmental field, MOECAF acts as the national focal point. The main international and regional environmental agreements joined by Myanmar are listed in List of international conventions and agreements relevant for ECD and implementation of ECL and further details are provided in Appendix 5.

3.5 Mechanisms for public participation in the implementation of environmental protection in Myanmar

3.5.1 Types of civil society organisations and registration

The Organisation for Economic Co-operation and Development (OECD) defines civil society organ-

isations (CSOs) as the multitude of associations around which society voluntarily organizes itself and which represent a wide range of interests and ties. These can include community-based organisations, indigenous peoples' organisations and non-government organisations (http://stats.oecd.org/glossary/detail.asp?ID=7231).

In Myanmar, a growing number of CSOs are taking an active interest in environmental governance. They include charity organisations, religious groups, organisations of ethnic groups, environmental organisations, human rights organisations and business organisations. A number of international non-governmental organisations are also active in Myanmar. The CSO workshop organised for this assessment brought together a variety of different CSOs (see Appendix 2 for details) whose activities range from the guarding of specific local interests to environmental education and general societal development. Discussions at the workshop demonstrated that CSOs can make significant contributions to environmental governance in Myanmar. They are able to raise environmental awareness, provide observations on the state of the environment, act as watchdogs in environmental monitoring and support community based management of natural resources.

There is no comprehensive registry of CSOs in Myanmar, but the Association Registration Law of July 2014 (No. 31.2014). The Registration Law aims to implement a system for registration of NGOs and INGOs, which the Government recognises work for the benefit of Myanmar citizens, and contribute to a 'strong civil society'. The Registration Law is also intended to provide for the free formation and movement of organisations as well as regulating the relationship between NGOs, INGOs and responsible Government Ministries. There is still a lack of implementing regulations to make the law work as intended.

3.5.2 Participation processes

Since 2013, the Presidential Notification No 27/2013 has mandated the establishment of township and ward/village tract development support committees (TDSC, W/VDSC) to enhance participation of local people and organizations in development planning. However, there is lack of clarity on the formal (de jure) functions of the committees in the absence of operating guidelines or terms of reference. The role of these public bodies is limited to an advisory one in support of township management committees (TMC), which consist of township head of departments from key ministries with a responsibility to collate priorities. The degree to which TMCs seek advice from TDSC and W/VDSC varies. The procedures according to which the members of TDSC and W/VDSC have been selected, and hence which segments of the society they represent, differ significantly from one township to another across the country. A consistent factor is the low level of representation of women in the committees. The awareness of local people of these committees still appears to be very low (UNDP Myanmar, 2015a, 2015c).

Other mechanisms for participation in public planning in rural Myanmar include village-level meetings with the Village Tract Administrator (VTA), the Village Clerk or '10 Household Heads', elected representatives of a grouping of households. The GAD organizes regular coordination meetings, dedicated committee meetings, public meetings at the village level and public display of written notices to communicate government policies (Kyi Pyar Chit Saw and Arnold, 2014; UNDP Myanmar, 2015c). According to a local governance study by the UNDP, access to information on public affairs at the local level typically works through the VTA and the 10 household heads, while media is much less followed (UNDP Myanmar, 2015c). These channels are thus vital for information on e.g. participation opportunities to reach the lowest levels. Following this hierarchical chain of communication and securing the participation of the right people was considered a challenge by consultants organizing EIA consultations (workshop for private sector, 25 May 2015).

CSOs are increasingly participating in environmental planning at different levels of governance, through membership in governmental committees, working as experts and consultants in government or international NGOs' projects, and through piloting sustainable technologies and contributing their experiences to public policy planning. In the CSO workshop organized as part of this assessment

in Yangon (22 May 2015), it was noted that there were different types of CSOs in Myanmar engaging in varying ways in environmental governance. Some are expert organizations with highly skilled members, for example retired government officers acting close to non-profit consultants. Some are ethnic-based CSOs with a focus on regional politics, many in diaspora, while others have grown out of community-based organizations. Still others are humanitarian or rights-based organizations with social work as their main concern and environment as a secondary concern. Social and environmental activism may be bundled in campaigns around specific development initiatives. For instance in Dawei, Tanintharyi region, CSOs have formed a network to raise concerns over environmental and social protection, involuntary resettlement, information disclosure and potential malfeasance related to the Dawei Special Economic Zone and deep-sea port project (UNDP Myanmar, 2015c).

A further division concerns CSOs that have been registered with the government and those that have not. Only the registered CSOs are recognized as regards formal participation mechanisms, while the rest may try to influence development and the conduct of public affairs through protest and grassroots activism and action. In that regard, the CSOs considered their position in the current system precarious. On the one hand, getting involved in e.g. the formal governmental committees may entail the risk of lost credibility among other CSOs and the general the public, if seen as working too closely with the government. It was also considered frustrating if the views contributed through public consultation processes did not affect the outcome, i.e. participation remained symbolic rather than influential. On the other hand, working outside the government and through protest action is still risky due to vague constitutional provisions allowing forming associations and freedom of speech so long as it does not threaten “peace, law and order or morality” (Constitution, 2008, section 354).

Recent legal reforms have granted access to civil society members to cross-sectoral coordinating committees, such as the Regional Environmental Conservation and Supervising Committees (see above). In the CSO workshop (22 May 2015), further legal clarifications related to the role, rights and responsibilities of the civil society in environmental governance were called for, especially in terms of improving access to information, mechanisms to submit grievances and seek redress, and coordinating between the government, civil society and private sector.

Public consultations have been organized as part of ongoing policy reform and strategy formulation processes. For instance, the updating of the National Biodiversity Strategy and Action Plan in accordance with the Aichi Targets, as well as the formulation of the National Land Use Policy, involve public consultation efforts. The latter has been lauded as a landmark process in terms of public participation in the political transition in Myanmar. The draft Land Use Policy, made available for comments, and 17 nationwide public consultations were held in 14 states and regions (meeting with Forest Department, MOECAF, Nay Pyi Taw, 29 April 2015). The lessons from these processes should inform the development and institutionalization of public participation mechanisms for a wider legitimacy and effectiveness of environmental policies.

4. IDENTIFIED GAPS IN IMPLEMENTATION AND ENFORCEMENT OF THE ECL

This chapter focuses on tasks related to the ECL. Each section examines as appropriate the regulatory base, the governance practice, capacities and resources, cross-cutting objectives and ongoing activities and future needs. Concrete examples have, where available, been drawn from different sectors. The thematic areas covered in this chapter are:

1. National and regional planning to implement environmental policies
2. Environmental licensing, EIA and SIA
3. Pollution control
4. Management of chemicals and hazardous substances
5. Urban environmental management
6. Economic mechanisms in environmental protection
7. Cooperation in conservation of natural resources, biodiversity and cultural heritage
8. International environmental agreements
9. Awareness raising, information management, research, dissemination and training
10. Access to environmental justice

The thematic topics are selected so that they cover all the relevant duties of ECD in the ECL. Each topic focuses either on a specific environmental concern or a specific set of policy instruments. The role of the ECL and the ECD in the different areas varies depending on other legislation and the mandate of relevant authorities. Each topic includes a narrative sub-section, discussing the bottlenecks in light of the checklist of issues in the analytical framework (Section 2.1).

The analysis touches identifies key gaps, but the scope of the project did not allow for a detailed analysis of all relevant administrative sectors and their financial and human resources. The report does therefore not provide a complete picture. Detailed plans for action will therefore require more specific collection of information.

4.1 National and regional planning to implement environmental policies

National and regional plans for the implementation of environmental policies are expected to be concrete and guide action on the ground.

Regulatory base

According to ECL Chapter III, section 6(g) the powers of the National Environmental Conservation Committee (NECC) include "laying down and carrying out the Myanmar national environmental policies and other environmental policies for conservation and enhancement of environment with the approval of the Union Government." The duties of the Ministry include the "(a) implementing the environmental conservation policies; (b) planning and laying down national or regional work plans relating to environmental management; (c) laying down, carrying out and monitoring programmes for conservation and enhancement of the environment, and for conservation, control and abatement not to cause environmental pollution" ECL IV, section 7(a,b,c).

The terms of reference for the Regional Environmental Committees (RECs) specify the following planning duties:

- plans for conservation of natural resources and cultural heritages
- plans and directives for sustainability and efficiency of energy use

In addition the RECs should supervise issues related to climate change mitigation and adaptation, environmental management in urban and industrial areas, management of wastes, sustainable use of natural resources and environmental impact assessment. (Notification No 22/2014 the Union Government Office).

Table 5: Examples of policies, plans and strategies for achieving environmental objectives

Specific Policy, plan or strategy	Status May/June 2015	Authority in charge
National Land Use Policy	Under revision 6th draft available	MOECAF, Forest Department
National Biodiversity Strategy and Action Plan	Published 2011, under revision	Forest Department, Nature and Wildlife Conservation Division
Myanmar's National Adaptation Programme of Action (NAPA) to climate change	Published 2012	Department of Meteorology and Hydrology, Ministry of Transport
Myanmar Action Plan on Disaster Risk Reduction (2009, 2012)	Published 2009, 2012	Relief and Resettlement Department, Ministry of Social Welfare
Climate Change policy and strategy development	Under development	ECD, Policy, International Relations, Training and Research Division with Myanmar Climate Change Alliance
National Action Plan for Green Growth	Under development	ECD with strong donor and CSO support. Broad participatory work, including Ministries and Civil Society Organisations
Environment and health action plan (NEHAP)	Published, revision started	ECD and Ministry of Health
Overall waste management strategy	Drafting started	ECD Pollution Control Division
Myanmar Responsible Tourism Policy 2012; Tourism Master Plan 2013-2020	Approved policy, published 2013	Ministry of Hotels and Tourism
Myanmar Comprehensive National Development Plan to incorporate existing Sustainable Development Strategy of 2009	In preparation	Ministry of National Planning and Economic Development (MNPED)

Governance practices and capacities

Myanmar has since the 1990s developed a basis for environmental policies. These include the National Environment Policy (1994), a specific Forest Policy (1995), the Agenda 21(1997), the Millennium Development Goals (MDGs) for Myanmar (2006) and the National Sustainable Development Strategy (NSDS, 2009).

The policies cover broadly important environmental areas and provide general objectives. More detailed policies, plans and strategies for achieving the stated objectives are currently being developed within different sectors. These include, for example, land use, biodiversity and climate change (Table 5). Many strategies developed by other Ministries can have significant environmental impacts. These include strategies for electrification, general development and transport, tourism and agriculture development (FAO, 2011). Tourism is an important area as it may expand rapidly, leading to also infrastructure development. Some areas lack explicit environmental strategies. Thus there are, for example, no national policy targets for environmental improvement in the mining sector. (ADB, 2012b)

Governance practices are still evolving. A particular challenge is the accountability relationships between the state and the region departments, the union sectorial ministries and the Hluttaws are still unclear, and this can hamper the implementation of the ECL.

At the regional level few environmental strategies exist, but for example the Forest Department of MOECAF has developed management plans at the regional level. Waste management plans as City and Township Development Committees have enacted solid waste disposal and collection bye-laws. The recently established regional and State level environmental committees may have a role in policy development, but it is not yet clear how strong their role will be.

Along with the strategy development the need for strategic environmental assessment (SEA) has been expressed in several connections. There are features of SEA in different planning procedures

Rivers are used for transportation, drinking water, washing, industry, fishing and habitation. *Diplomatic Mission of Finland*

and international finance organizations require using SEA-like tools, e.g. in Myanmar Ayeyarwady integrated river basin management project that will be financed by World Bank. Norway has initiated the *Oil for Development* programme[6] for the oil and gas sector that includes SEA type elements. As there is no legal base for SEA it has developed in an ad hoc manner which may cause confusion concerning its status and role. There is thus a need to reflect on how to develop the assessment of plans, policies and programmes.

In the ECD policy development is coordinated by the policy, international relations, training and research division, but specific policy issues are dealt with by experts in relevant divisions of the ECD. However, relevant policy development work also occurs in other Ministries that play an active role in environmentally relevant areas (for example, Ministry of Agriculture, Ministry of Industry, Ministry of Transport). At the regional level the ECD has limited resources, but regional governments have a mandate to develop strategies for their own regions.

Cross-cutting objectives

The overarching policies such as the National Sustainable Development Strategy (NSDS 2009) recognise cross-cutting objectives such as poverty alleviation and other millennium development goals. Cross-cutting objectives also arise in other policy areas such as energy, including energy efficiency, transport and regional development. Cross-cutting issues have arisen in, for example, resettlements related to planning of large scale hydropower development, systems for compensation and land use rights. Both CSOs and private

6 http://www.myanmar.norway.info/NorwayMayanmar/DevelopmentCooperation/

sector organisations identified social impact assessment to be important in addressing cross cutting objectives.

Ongoing activities by development partners

There is ongoing active work to develop policies in several sectors. Many of these are driven by international obligations or initiatives such as the UNFCCC or the CBD (Table 4). Both climate change and biodiversity are policy areas that are subject to intensive development supported by development partners.

Gaps and needs

Three main needs can be identified:

1. There are few implementation plans that specify the concrete measures required to achieve stated objectives of these strategies. Several policies include ambitious objectives but it is not clear what steps will be taken to achieve them. By focusing on programmes that identify concrete actions and responsible actors it would be possible to determine roadmaps for progress towards the stated objectives.
2. The relationships between the state and the region departments, the union sectorial ministries and the Hluttaws need to be clarified to allow them to work together for effective ECL implementation and policy development. The possibilities for and role of regional plans (Need 2) should also be clarified in this context. The role of regional and State level environmental committees should be evaluated to identify and disseminate good practice.
3. Few environmental plans have been developed at the regional and local level. For example, regional strategies and plans would be needed for integrated watershed management or coastal management at an appropriate geographical scale. Such plans and strategies would compile and provide information on the regional state of the environment and thereby provide a baseline against which the impacts of specific projects and activities can be judged. The lack of regional and local environmental plans is reflected in missing baseline information. This either leads to a neglect of relevant impacts or an increase in the burden on individual development projects that need to identify baseline conditions. Environmental management plans that lack reference to agreed objectives and monitored baseline parameters for the state of the regional/local environment are difficult to enforce and monitor.

Recommendations

1. At the national level, the ECD should develop action and investment plans for environmental priority areas. Such plans should identify the foreseeable main pressures in, for example, forestry, agriculture, mining, hydropower development, coastal exploitation, oil and gas exploitation, and urban development and would support follow up at the regional level. The necessary steps to meet the challenges should be specified, along with action points for authorities at different levels.
2. Clarify mandates and relationships between the state and the region departments, the union sectorial ministries and the Hluttaws.
3. Regional authorities should prepare regional or watershed-based comprehensive environmental plans that systematize the information on environmental conditions, main drivers and environmental objectives at a regional level. Such plans would provide baseline and reference values for major development projects at a regional level. Monitoring needs to be developed using appropriate technical tools.

4.2 Environmental licensing, EIA and SIA

Under this theme, the focus is on the administrative procedures and the stakeholder participation in the environmental licensing of regulated activities. The procedures include the environmental and social impact assessment (ESIA) or initial environmental examination (IEE) of new projects and the issuing of Environmental Compliance Certificates (ECC) based on the findings of the ESIA/IEE. For existing activities the approval of Environmental Management Plans (EMP), the monitoring of impacts and the grievances mechanisms are the main administrative procedures to be covered.

A crucial aspect in this theme is the integration of environmental licensing with sector specific licensing procedures and the licensing activities of the Myanmar Investment Commission (MIC). More technical aspects of pollution control are discussed under theme 4.3.

Regulatory base

The ECL provides the general legal base that is further specified by the Environmental Rules (ER). Chapter XI of the ER (Articles 51-61) defines the framework for the Environmental Impact Assessment (EIA) system. ECL and ER set a framework for EIA but they don't include detailed provisions for EIA procedure which are still under development.

The ECL mandates MOECAF to develop and implement an EIA system. MOECAF drafted a detailed EIA Procedure and Administrative Instruction of EIA Procedure in 2013. After a consultation process it has now been submitted for the approval by the Union Government. At the same time, more detailed Administrative Instructions for an EIA Procedure and EIA guidelines have been drafted by MOECAF to guide the practical implementation of EIA. These Instructions and guidelines are also close to being finalized, and are expected to be formally adopted very soon after the EIA Procedure comes into effect.

An IEE or EIA must be conducted for projects initiated after the ER/EIA Procedures have entered into force. According to the draft EIA Procedure any project that would normally be required to conduct an Initial Environmental Examination (IEE) or an EIA, but was established before the Environmental Conservation Rules were issued, must have an Environmental Management Plan (EMP). The EMP will be approved by Environmental Compliance certificate (ECC) issued by the ECD. According to the ER, a qualified third party that has been registered with the Ministry (MOECAF) must conduct an IEE or EIA and prepare an EPM. The project required to conduct an IEE or EIA are listed in an Annex of the EIA Procedure (draft).

The Foreign Investment Law puts demands on environmental assessments. MIC Notification No. 1/13, amended by Notification 50/2014, sets out a list of "Economic activities that require Environmental Impact Assessment". This list is not the same as the list in the Annex of the draft EIA Procedure.

Together, the EIA Procedure and the EIA instructions will establish a legal framework for when EIA will be required for economic development activities involving natural resources in Myanmar. Notably, the EIA system has connections with the Foreign Investment Law's process for considering investment proposals from foreign entities, but they have not been fully linked. How investment applications demonstrate that the EIA requirements have already been fulfilled (either in the form of an endorsed environmental assessment or a certification from MOECAF that one is not required) will therefore have to be developed.

It is important that different laws are coherent so that they do not conflict with each other. Sectorial laws should not include details on EIA requirements but should refer back to ECL and its associated regulations and procedures. For example, the new Mining law will be require new Regulations which will play an important role in guiding practices and processes in the mining licensing procedures. Transparent processes are important for the legitimacy of the EIA and subsequent licensing. Once the EIA Procedure is in force, MIC should withdraw its separate list of activities requiring EIA/IEE and refer only to the EIA Procedures.

Prior Permission

There are provisions (ECL Chapter X, ER Chapter XII) defining prior permission. According to these provisions anyone who desires to carry out an investment project with potential environmental impacts shall obtain a prior approval of MOECAF. MOECAF shall, if the application for prior permission is accepted after scrutiny, issue the prior permission by prescribing terms and conditions to be followed. Currently there is no basis in the law for the Ministry to determine whether or not to issue a permit, and whether to impose environmental compliance conditions on the user. According to draft EIA Procedure the Environmental Impact Assessment Committee shall issue a certificate to the proponent conferring environmental approval (EIA / IEE report + EMP) and specifying the terms and conditions of implementation and operation of the project.

Social Impact Assessment (SIA)

According to ECL (Chapter IV article 7 m) the Ministry (MOECAF) is responsible for developing SIA together with EIA. Definition of EIA (article 2d) in ER includes also human, social and socio-economic impacts and they are specified also in Draft EIA Rules and in Draft Administrative Instructions of EIA Procedure and in Draft EIA Guidelines. However, even though social issues are within the mandate of ECD, the draft EIA Procedure does not address resettlement and compensation matters related to affected people. At the moment there are no specific regulations on such matters and the draft EIA Procedure says that projects shall follow international best practice on involuntary resettlement and indigenous people. It remains unclear which ministry will be responsible for reviewing, approving and overseeing the related management plans and their implementation. Strengthening SIA requires social and socio-economic expertise both at MOECAF and at consultant companies and also strengthening the possibilities for civil society participation in the processes. Furthermore, skills in gender analysis and adequate involvement of women are needed.

Governance practices and capacities

MOECAF has established an EIA Review Committee with sectoral teams following the draft EIA Procedures. The EIA Review Committee reviews EIA reports and submits its comments to ECD. The chairman of the EIA Review Committee is from ECD and EIA Review Committee includes 39 members from different line ministries and other organisations. The Review Committee has officially had functions only on Letpadaung Copper Mine so far.

In ECD the Division for Natural resource and EIA / EIA branch is carrying out the EIA functions and duties according Environmental Conservation Rules. There are 4-5 officers in EIA Branch in ECD to review EIAs / IEEs. The review is done at the central level but there have been discussions on transferring the public participation according to EIA regulations to ECD's regional offices.

Up to October 2014, the ECD had reviewed 63 scoping documents, 7 IEE reports, 3 EIA reports and 2 EMPs. (Maung Maung Than, Myanmar in-depth study on country EIA policy and its implementation, Institute for Global Environmental Strategies, draft 2015). By the end of May 2015 ECD has listed 53 companies conducting EIAs, both national and international. According to Ministry of Industry (2015) there are approximately 45 000 enterprises, of which 5 000 major scale (see Table 2 in section 1.2.). The number of EIA, IEE and EMP documents requiring review is constantly accumulating and in anticipation of the final EIA procedure, the workload related to EIA review is expected to increase significantly. Current resources for EIA review are unlikely to be able to cope with the strict time demands of the EIA review procedure (private sector workshop, 15 May 2015).

Cross-cutting objectives

The scope of EIA is wide and it is crosscutting in nature. EIA includes not only biophysical environmental elements but also human, social and socio-economic environmental elements (ECL Article 2 d). Social issues, consultation and public participation are key elements in EIA.

Ongoing activities by development partners

Several development partners have focused on supporting the development EIA in Myanmar. The EIA Procedure is being finalized with the support of the GMS Environmental Operation Centre (GMS-EOC) and of the Asian Development Bank (ADB). The registration instructions for EIA consultants and the Technical Guidelines for the implementation of EIA Procedures were drafted with technical assistance from Japan International Cooperation Agency (JICA). Several training programmes have been conducted with technical support by Vermont Law School, JICA, Norway (oil and gas sector under the Oil for Development programme) and My Asia. UNDP has been implementing a global, joint UNDP-UNEP programme called the Poverty Environment Initiative (PEI) since 2014, to enhance capacities to sustainably manage natural resources at local, regional and national levels. The PEI aims to mainstream social and environmental considerations into planning and investment management, which supports EIA implementation and the implementation of the ECL, with a strong focus on the relationship between environmental management and poverty reduction.

ADB has planned technical assistance for establishing the EIA review and approval system. GMS-EOC has an ongoing project for technical assistance for safeguard strengthening encompassing preparation of EIA Procedure. Myanmar Centre for Responsible Business (MCRB) convened a workshop on environmental and social impact assessments for offshore seismic studies and provided recommendations for consideration in finalizing EIA Procedure. Norwegian Environment Agency / Ministry of Climate and Environment have an ongoing project for capacity building on the environmental aspects of responsible petroleum sector management, through the Oil for Development programme; ECD has requested assistance with EIA sectoral guidelines and industry guidelines / standards; immediate planned activity is assistance in approval of offshore field EIAs. Vermont Law School (both private and USAID funding) has an ongoing project on capacity building in EIA preparation and review; currently providing a monthly series of short training on environmental review. Netherland has planned supporting MOECAF in EIA capacity building in close collaboration with other partners. Many other development partners have activities to strengthen the administrative capacity of ECD and developing safeguards contributes also strengthening the implementation of EIA. The International Finance Corporation (IFC) is developing a SEA for the hydropower section related to Sustainable Hydropower in the Mekong Region.[7]

Sectoral EIA guidelines are urgently needed and several development partners have indicated ongoing or planned support in this area. Norway is starting to draft sector guidelines for oil and gas sector, possibly with contributions from the Netherlands. Australia has been indicated as planning to support the drafting of sector guidelines for mining. Dam and Hydropower, Industry and Industrial Zone, Special Economic Zone and Infrastructure have been mentioned as additional sectors needing EIA guidelines. The Netherlands is providing TA to the Ministry of Transport in capacity development of EIA related projects in the water sector and in particular in the framework of integrated water resource management (Arend Kolhoff, NL Embassy, May 2015).

7 http://www.ifc.org/wps/wcm/connect/Lao_EXT_Content/Sustainable_HydroPower/Sustainability_HydroPower/

Gaps and needs

The EIA Procedure is to be approved in the near future, after which Administrative instructions and EIA Guidelines can be issued. Once the EIA Procedure is approved there is a need for harmonizing other laws so that they form a clear and coherent entity. The practical implementation of these new regulations needs capacity building among all involved parties in the EIA process.

Taking into account the rapid economic development in Myanmar and the coming EIA Procedure, the amount of EIA / IEE / EMP cases to be processed will increase rapidly. This means a significant work load for the ECD, as immediately upon approval of the EIA procedure there is a need to review the backlog of EIA reports that are continuously accumulating. The need for additional resources, technical support, training and strong management of the review process, including possible prioritisation of projects, is evident. One example of a concrete need is a functioning system and procedures for documents control and archiving of ingoing and outgoing correspondence related to the EIA process. Many development projects in Myanmar may have significant impacts on local communities, thus procedures and capacity development for the assessment of social impacts as part of the EIA procedure are urgently needed.

EIA Procedure will define projects needing EIA or IEE. The amount of upcoming EIA/IEE cases depends on the number and type of the projects to be included in these procedures. It should be balanced with the significance of environmental impacts and size of the projects and take also into account the ECD's capacity to manage the upcoming administrative tasks.

While the EIA focuses on new activities, existing facilities and their adverse environmental impacts also requires attention and resources. There is also need for EIA guidelines and sectoral standards for small scale industries.

Recommendations

Based on the gap analysis, the following priorities are proposed:

1. The most important step forward is to get EIA Procedure with Administrative Instructions and Guidelines finalized and into effect. Of particular importance is that the legal responsibilities are clarified concerning which authorities are involved and what their mandate is with respect to approving and monitoring EIAs and EMPs. Implementing EIA Procedure means a huge work load and resource need in the ECD but also among developers and consultants and there is a risk of significant delays which would undermine the legitimacy of the system. The workload will depend on the thresholds for EIA / IEE activities and by giving a transition period long enough for existing activities to submit their EMPs to MOECAF.
2. A specific project should be conducted to identify environmental risks of existing activities in order to identify those installations where an EMP is urgently needed.
3. Sector Guidelines for the most important industries are needed to support effective and coherent implementation of EIA. Oil and gas, mining, dam and hydropower, industry and Industrial zones, special economic zones and Infrastructure have been identified as priority sectors needing EIA guidelines.
4. Sector EMP guidelines and standards for small scale industry would streamline the preparation and processing of the applications both within the industries and administration.
5. There is a need to create a learning process for developing EIA practice. Intensive EIA capacity building is needed especially within ECD and its regional offices, but also more broadly within other regional/state administration as well as industries and consultants. Joint seminars and conferences between different actors involved in EIA could raise common understanding and coherent implementation of EIA.
6. There is strong attention to the development of EIA among Development Partners and many projects are going on in this field. DPs should develop their coordination and cooperation of technical assistance to ensure effective and coherent EIA capacity building.
7. Development of SIA in coordination with the responsible authorities to ensure that social aspects are adequately covered in EIAs. The SIA should require thorough analyses of land tenure and local livelihoods for the determination of appropriate and fair mitigation mechanisms of potential livelihood losses. Gender issues should be explicitly recognised. In contexts such as rural Myanmar, rife with overlapping customary and statutory claims to resources, it is particularly important to follow procedures that are as inclusive as possible, to avoid adverse impacts on the already most vulnerable segments of the population.

4.3 Pollution abatement and control

Under this theme the focus is on the duties of ECD in developing the technical aspects of pollution control (e.g. emission standards), the ambient and compliance monitoring capacity and the information management related to pollution. The focus is on point source pollution as the regulations provide little instruments for dealing with non-point source pollution caused by, for example, agriculture. Pollution problems related to urbanization are also discussed under theme 4.5. Urban environmental management.

Regulatory base

Pollution control and abatement regulation consists of setting environmental standards, regulating point sources of pollution, regulation of pollution from dispersed sources such as agriculture, vehicles and regulating emissions from the use of chemicals and the contamination of consumer products.

According to ECL Chapter IV the Ministry has the mandate to:

- **Prescribe environmental standards** including standards on emissions, effluents, solid wastes, production processes and products for the enhancement of environmental quality (article 7 d). The duty of coordinating with other authorities regarding environmental standards is assigned to ECD in article 39 (a) of the ER.
- **Prescribe the terms and conditions relating to effluent treatment** in industrial estates and other buildings and emissions from machines

and vehicles (article 7j and article 43 of the ER). This occurs mainly through the EIA and permitting procedure (see Chapter 4.2. of this report). The permitting authority is delegated to ECD in rule 26 of the ER.

- The **monitoring of pollution** is assigned to the Ministry in Chapter VII of ECL. The use of agro-chemicals, use and disposal of hazardous substances in industry, disposal of waste from mining, emissions from waste management and sanitation and construction are mentioned as potential sources of pollution (article 13). ECD is given the mandate to monitor compliance with the environmental standards (ER 39b and 46).

Before the issuance of the ECL and ER, pollution control was regulated with sector specific legislation or by forbidding polluting activities on the basis of public health regulations or the Criminal Code. For example the Ministry of Industry has issued multiple standing orders to this effect: Occupational Safety Plan (Standing order 1/95) to prevent occupational accidents caused by unsafe working conditions and mistakes; Occupational Health Plan (Standing order 2/95) to protect workers' health against occupational diseases and promote their general health; Water and Air Pollution Control Plan (Standing order 3/95) to prevent pollution and destruction of the natural environment from waste; and Food and Drug Control Plan (Standing order 4/95) for the protection of the consumer health. Ministry of Agriculture and Irrigation has issued standards regarding product safety of fertilizers and agrochemicals (Fertilizer Law 7/2002).

Governance practices and capacities

To regulate pollution the regulating authority has to have the necessary mandate in legislation, the acceptable level of emissions or impacts must be defined and the means of verifying the deviations from the norms have to be available. The limits for emissions can be defined either by issuing emission and/or ambient environmental standards or by defining the emission limits in the permitting procedure of each individual case. In industrialized countries both instruments are usually used.

The environmental emission standards for Myanmar have been prepared by ECD with the support of development partners but they are still not issued. Also the EIA regulations are still pending so there is no practical experience in issuing case by case Environmental Compliance Certificates (ECC) where emission limits and emission load limits would have been defined. During this transition phase environmental norms from other countries or norms or guidelines issued by international organizations such as WHO or IFC have been applied. The Environmental Division of the Ministry of Mines reported that when the Ministry of Mines issues production licenses for metal ore mines, it is already practice to set emission limits in the license. (MOM Environmental Division, interview 30.4.2015).

With the environmental standards and guidelines pending and with the technical capacity of monitoring compliance almost totally missing the only approach available to the ECD has been a case by case reaction to complaints. The Pollution Control Division and the newly established Regional ECDs are receiving complaints of pollution cases where the harmful impact is evident, such as visible smoke, dust, smell, turbidity or colour in effluents or dumping of solid wastes. In some cases fish have died in the recipient lake or pond possibly as an impact of wastewater discharges. For example in the case of massive fish deaths in the Taung Tha Man lake near Mandalay city centre in 2015, the pollution control authorities of Mandalay CDC and ECD decided to temporarily close down the industrial establishments (mainly food and drink industry) discharging wastewater into the lake. This shows that fair governance is difficult when there is poor data available of the baseline status of the water quality and on the emission load of each polluter.

Despite the ECD being a very recently established authority, it is recognized in the sector ministries. For example the Ministry of Industry regularly reports the findings of its environmental inspections to ECD. The Directorate of Industrial Supervision and Inspection (DISI) supervises the environmental management of private industries. The involvement of both the ECD and the Ministry of Industry at the level of individual enterprises may lead to

Small-Scale Gold Mining in Myitsone Area, Kachin State. *Mangshang Yaw Bawm, 2013*

Mining Area in Dawei Township, Tanintharyi Region. *Environmental Conservation Department*

confusion concerning the environmental regulation. For Mining the ministry of Mines also issues permits that need to be coordinated with the ECD.

ECD is also coordinating with the Ministry of Health in revising the National Environmental Health Action Plan (NEHAP). The current plan from 2010 raises health impacts of natural disasters (water safety, sanitation), respiratory problems from air pollution in cities and lead and arsenic poisoning) as priority concerns.[8]

Yangon and Mandalay Pollution Control and Cleanliness Departments have emerged as the front runners in environmental compliance control. They have issued their own emission standards for five basic parameters for industrial effluents (BOD, COD, TSS, TDS and pH). The standards were based on the authority given by the YCDC Law and the MCDC Law, respectively. They have sampling equipment and basic laboratory facilities for analysing these parameters. Yangon PCCD has registered over 3400 industrial establishments in their area. 300 of them are relevant in regard to wastewater emissions. Since 2012 the city administration has gradually started to enforce pollution abatement measures.

The PCCD has taken two rounds of wastewater samples and reporting those exceeding the standards to the YCDC. Pressure has been exerted on those companies and some of them have taken action for reducing their emission load. For one new industrial zone a pre-emptive strategy has been applied where the investor has provided centralized wastewater treatment and solid waste management services against fees. (YPCCD interview 27.5.2015). In Mandalay a Thai company is about to build an industrial wastewater treatment plant for one industrial zone. Mandalay CDC has set emission limits for the discharge from this wastewater treatment plant. ECD will monitor the performance in cooperation with the MPCCD. An analysis of the experiences will be important for judging the appropriateness of the limits.

Capacities and resources

The staffing of ECD Pollution Control Division at the central level consists of a staff of 20 including the Director and two Deputy Directors. There is no database of polluting industry or estimate of the number of such units. The workload is divided between Urban Environmental Management and Industrial Pollution Control in addition to the task of preparing environmental quality standards (ECD PCD interview 29.4.2015, TOR of ECD PCD).

Regional ECDs have been established in all 14 Regions and States, the latest five offices having started their operations in April 2015. These Regional ECDs have a staffing of 10-20 experts, usually with B.Sc. or M.Sc. level education in Forestry, Science or Technology. Recruitment of staff is still

8 http://www.lse.ac.uk/GranthamInstitute/law/national-environment-and-health-action-plan/

in the process, for example Yangon ECD currently has 13 staff members with one expert stationed in the MIC office and another at SEZ one-stop shop. (Yangon ECD interview 8.5.2015, Mandalay ECD interview 12.5.2015).

The Ministry of Industry and the Ministry of Mines have their own inspectorates for monitoring compliance with mining and environmental regulations within their corresponding field of inspection. The Environmental Division of MOM has a staff of about 12 with university level education (MOM interview 30.4.2015).

The capacity to monitor emissions is limited in Myanmar. Some of the line ministries have laboratories under their organization, among these are the laboratory of the Ministry of Health (e.g. drinking water monitoring), the Ministry of Science and Technology (special cases of pollution monitoring), and the Ministry of Energy (some environmental analysis). The Ministry of Mines' Department of Inspection has a laboratory in Yangon and Mandalay for monitoring elements from mineral and leachate samples. One environmental NGO EcoDev has established an environmental laboratory for supporting complaint cases of affected people. This laboratory has been partly funded by EU. (MOI interview 14.5.2015, MOM interview 30.4.2015)

Cross-cutting objectives

The impacts of pollution threaten the health and livelihoods of people. The abatement of pollution is a human rights issue with significant implications also for poverty alleviation. In the planning and permitting procedures for potentially polluting activities, it is crucial to follow procedures that identify and assess the potential impacts of pollution – including the impacts of eventual environmental accidents. Access to information must be ensured to the affected stakeholders, regarding the expected pollution load, its likely impacts and the proposed mitigation measures in understandable terms.

For existing activities, the mechanisms must be in place to express complaints or fear of negative impacts and to receive a rapid, fair and transparent reaction to the grievances from the administration and the operator of the activity.

The public should have access to information about the state of their local environment, presented in a meaningful way. NGOs and CBOs can assist the government in mediating the local concerns, acting as watchdogs and in facilitating the dissemination and interpretation of environmental information.

Ongoing activities by development partners

ADB and EU have jointly supported ECD in preparing environmental emission standards. The draft is completed and it is a comprehensive document (over 70 pages). It is proposing emission standards for all the industrial sectors and other activities that are required to conduct an EIA according to the draft EIA regulations. The air pollution standards are based on WHO Air Quality Guidelines and on the principle that a single pollution source is not allowed to exceed more than 25 % of the ambient limits with its emissions. For wastewater emissions a set of about 25 parameters are given as generic guidelines and sector specific additional or stricter guidelines are provided for specific operations. Also noise level limits for industrial sources are provided. (National Environmental Quality (Emission) Guidelines, draft 22nd April 2015). Ambient standards for rivers and lakes have not been drafted. International and regional guidelines for these can be applied (Interview with ADB 19.5.2015). ADB is prepared to continue support to the environmental monitoring system until 2017.

JICA is currently supporting ECD and the CDC of Mandalay and Yangon in building capacity in water monitoring in 2015-2018. The two cities will act as pilots. 20-30 water monitoring points will be established and a database will be developed for managing the data. The support includes monitoring equipment for the basic water monitoring indicators. Drinking water monitoring is not included in the scope. Norway is currently supporting MOECAF in developing Integrated Water Resources Management (IWRM). The project implemented by the Norwegian Institute for Water Research (NIVA) includes development of methods and standards for IWRM, establishment of water quality monitoring in Inlay Lake and upgrading the laboratory at MOECAF. Japan has also financed air pollution monitoring equipment for measuring particles from urban ambient air (PM 10 and PM 2,5). One

station is already established at the Mandalay ECD office premises.

The MOI has prepared environmental plans for three industrial sectors: steel mills, ceramic ware mills and paper and chemical product mills. The DISI is also regularly monitoring food and beverage industry and industrial boilers are inspected every year according to Boiler Law (revised in June 2015).

The Directorate of Industrial Collaboration of MOI is conducting the following projects in collaboration with United Nations Industrial Development Organization – UNIDO:

- Improvement of Industrial Energy Efficiency in Myanmar in collaboration with MOECAF
- Pilot National Resource Efficient and Cleaner Production Project, especially in food processing, textile and hotel industry in Yangon and Mandalay.
- Green Industry for Low Carbon Growth (Cambodia, Lao PDR and Myanmar cooperation)

The Ministry of Mines is drafting amendments to the Mining law and rules. The World Bank and also the Australian Aid have commented on and contributed to the discussion on the draft. Progress now depends on the fate of the Mining Law in Parliament.

Gaps and needs

The regulatory instruments for pollution control are about to be finalized: the legal mandate of ECD, the linkage to the MIC and sector specific licensing procedures, the EIA and environmental permitting regulations, the environmental standards and the administrative structures at central and regional/state level. The challenge is the practical implementation of the environmental permitting and the technical capacity of compliance monitoring and enforcing compliance. A particular issue is how to address existing installations.

The emission standards have been prepared based on international practice. The draft is very detailed and provides emission standards for various investment projects. It might be useful to divide the parameters into mandatory and recommended ones because enforcing all these parameters at once could create too big costs and challenges. Guidance documents for the application are needed for industry and authorities. There is a need to ensure that existing standards set by other ministries are harmonised with the new emission standards.

Recommendations

1. Laboratory capacity must be developed for monitoring typical parameters in wastewater emissions and air pollution (mainly particle emissions). Laboratory services must be complemented with field monitoring capacity at the Regional ECD and PCCD level in the major cities.
2. A national water quality monitoring program with coordination between ECD, Division of Watershed Management under Forest Department, Department of Irrigation, Ministry of Health and the PCCD of the major cities. On-the-job training for Regional ECDs on water sampling. TA to ECD on the interpretation and dissemination of findings.
3. On-the-job support to Central ECD and selected Regional ECDs and Regional Environmental Committees in designing and implementing a compliance monitoring plan related to organic and toxic releases from power plants, industry and mining. Cooperation with the management of industrial zones and a clarification of the division of responsibilities between the ECD, the Ministry of Industry and the Ministry of Mines is necessary. Self-monitoring practices should be developed for industrial operators.
4. Compliance monitoring database first for joint use by Central ECD and regional ECDs and in a second stage with linkages to the environmental inspectorates of the sector ministries and PCCDs of main cities. This should also lead to a general risk assessment that identifies those installations where there is an urgent need to improve pollution control.
5. Soft loans should be made available for central wastewater treatment facilities in existing industrial and special zones.

4.4 Management of chemicals and hazardous substances

This theme focuses on the role of ECD in the coordination of the management of the risks posed by the use of hazardous chemicals on human health and the ecosystems. The responsibilities of risk management are divided between different sector authorities, but ECD has a special duty of developing the systems for identifying and monitoring the environmental risks. The ECL also gives to lead role in regulating hazardous wastes to the MOECAF/ECD.

Regulatory base

MOECAF has the mandate for prescribing categories of hazardous substances that may affect significantly the environment (article 7 h) at present or in the long run on. It also has the mandate to specify categories and classes of hazardous wastes generated from the use of chemicals or substances (7 g) and is vested with the duty to promote the establishment of necessary facilities for the treatment of solid wastes or emissions which contain toxic and hazardous substances.

The National Environmental Conservation Committee, MOECAF and ECD are also given the mandate to carry out necessary measures relating to environmental emergencies (ECL article 9). In oil and chemical accidents ECD could have a relevant role in regulating the environmental aspects of the mitigation and response actions.

Myanmar is a signatory to international agreements which require the member states to regulate or ban the production, use or transboundary movement of listed chemicals or waste. ECD is the Myanmar's national focal point for the Basel and Stockholm Conventions.

The lead role in chemical policy is assigned to the Ministry of Industry (Prevention of Hazard from Chemical and Related Substances Law 2013, Pyidaungsu Hluttaw Law No, 28). The Central Leading Board stipulated by this law is chaired by the Minister of Industry. This board lays down the national chemical policy and issues certain chemical regulations e.g. related to labelling, licensing and storage of chemicals. It authorizes the laboratories providing analytical services related to chemical substances. It is in charge of mitigation of chemical hazards to human beings, animals and the environment (article 5 i, j and k). It can delegate its duties to other organizations.

The Central Leading Board shall form the Central Supervisory Board of the Prevention of Hazard from the Chemical and Related Substances. This Board is chaired by the Director General from the Directorate of Industry with the Director General from the Department of Fire Brigade as a Vice-chairperson and the persons from relevant ministries and Governmental Department and Organization as members. This board is responsible for the compliance monitoring of chemical use (8 a). It has the powers to prescribe chemical safety regulations, licensing regulations, guidelines and perform educative work related to chemical safety (8 c, g, h, k, l). It has the power to prescribe regulations on hazardous waste management (article 8 i). It is also tasked with the approval of import, export or transit of regulated substances (8 j). Central Supervisory Board shall perform to draw up a plan and lay down the directives relating to chemical emergencies (article 9).

The Central Supervisory Board can establish supervisory boards also at Region, State, Division, Self-Administered Zone, District and Township level, if needed. The respective Supervisory Board shall form the Board of Inspection which consists of persons from the Development Committee, Myanmar Police Force, Myanmar Fire Brigade, Department of Administrative, Department of Health, respective Government Department, Government Organization and at least a Chemist. The Board of Inspection is responsible for chemical safety inspection. It will report to the Supervisory Board.

For the purpose of implementing the provision of the law the Ministry of Industry may issue rules, regulations as required with the approval of the Union Government, the Ministry, the Central Leading Board and the Central Supervisory Board may issue notifications, orders and directives and procedures as needed. The executive rule has been drafted and approved by the Office of Union Attorney General. It still remains to be approved by the Union Government. Ministry of Industry will issue the notifications on prohibited and restricted

Experts from Environmental Conservation Department Conducting Waste Water Testing. *Environmental Conservation Department*

chemicals. These will include chemicals covered in Notification No.1/2012 by Ministry of Health, in Notification No.1/2013 by Pesticides Registration Board, in the Stockholm Convention and in the Chemical Weapons Convention.

Other sector ministries regulate chemical use in their respective sectors, for example the Ministry of Mines regulates chemicals use in the extracting of minerals, Ministry of Energy regulates the chemical safety in the oil and gas industry and the Ministry of Agriculture regulates the use of agrochemicals. The Registration Board has the authority to register or prohibit the use of pesticides and to issue regulations regarding the use of pesticides (The Pesticide Law. No. 10/90)

Governance practices and capacities

The Directorate of Industrial Collaboration (DIC) in the Ministry of Industry plays a key role in the implementation of the Chemical law. Plans have been made for establishing databases on chemical management.

There are increasing challenges in the use and management of chemicals in agricultural soil and food products (private sector workshop, 25 May 2015), which calls for joint activities between MOAI, MOI and ECD. The Plant Protection Division is responsible for registering and licensing of agrochemicals, testing of pesticide efficacy, development of pesticide use recommendation and training and food residue monitoring. (Latest situation of chemical management in Myanmar, workshop 28.10.2014 Yangon, Ministry of Industry).

The state-owned Myanma Oil & Gas Enterprise (MOGE) plays a leading role in emergency preparedness related to oil spills. They have conducted oil spill response drills where also other oil companies have participated. The Department of Marine Administration under the Ministry of Transport has a leading role in the emergency preparedness related to oil spills and in the preparation of the national oil spill contingency plan.

ECD is new in this policy sector and its role in relation to other ministries is under development. ECD Pollution control division has limited staff for conducting its duties in regulating environmentally critical chemical use and hazardous waste. DISI has staff with chemical safety training to conduct chemical safety inspections. MOI manages the licensing of industrial chemical use, export and import and also has some laboratory capacity for analysing industrial chemicals. Ministry of Agriculture has some laboratory capacity needed in the registration process of agrochemicals. Plant Protection Division has been active in providing training to farmers and chemical dealers and dissemination of awareness about agrochemical regulations to dealers. The workshops organised (Appendix 2) identified a need for improved extension services to deal with pollution issues related to agrochemicals.

Cross-cutting objectives

Chemical use is a major health and environmental concern in the context of Myanmar where the institutional capacity and the general awareness of chemical risks and the impact of toxic emissions is low. The contamination of potable water sources and the food chain with pesticides is one of the main concerns. Occupational exposure to hazardous chemicals constitutes a major risk for workers in industry, mining and agriculture sectors. The uncontrolled toxic wastewater emissions and the dumping of industrial hazardous wastes can lead to serious health impacts and costly remediation needs. Exposure to and health risks from hazardous chemicals such as pesticides, lead and

mercury are of particular concern for vulnerable groups such as women and children. For example, women typically work as labour at mining sites, forced to bring their children along, experiencing long-term effects of chemical exposure on their physical, mental and reproductive health (Earth Rights International 2004).

Oil drilling at sea and coastal areas pose a risk of oil spills. The large scale use, transport and storage of industrial chemicals and petroleum products constitute a risk of environmental emergencies.

Ongoing activities by development partners

The Norwegian Environment Agency NEA is providing TA to ECD in developing hazardous waste management capacity. The objective of the project is to support Myanmar in the implementation of the Basel Convention. NEA will assist in drafting HW regulations. SINTEF (a Norwegian research institute) will help in drafting a Master Plan for HW management. This will include a HW inventory. Preparation for the project started in May 2015 and the project will formally start later in 2015.

Ten companies in Myanmar had joined the International Responsible Care voluntary agreement by end of 2014. The Myanmar Responsible Care Council has received technical assistance from the Japan Chemical Industry Association in the implementation of the chemical safety commitments. Yangon University has contributed to the chemical safety training.

Myanmar Oil & Gas Sector-Wide Impact Assessment (SWIA) was conducted by the Myanmar Center for Responsible Business in 2014. This study included some observations related to leaks from oil pipelines and hazardous waste management.

Gaps and needs

The lead role in chemical policy is provided by the chemical law to the Central Leading Board and the Central Supervisory Board. MOECAF or ECD is not specifically mentioned in the chemical law but the ECL suggests important responsibilities in regulating the environmental impacts and risks of chemical use. Especially ECD has a lead role in regulating the management of hazardous wastes. It is crucial that the HW regulations ECD is preparing are coordinated with the chemical regulations issued or planned by the MOI. The classification and the hazard labelling of chemicals should constitute the basis for identifying and classifying hazardous wastes. Hazardous waste regulations should be issued taking into consideration both ECL and the chemical law and the mandates of respective Committees and Boards.

The assigning of most of the chemical regulation duties to two central boards and regional and local boards instead of Government Departments casts some doubts on the efficiency of such an organization and on the rapid and equitable registering and licensing of chemical management. It is advisable for the Central Leading Board to focus on the policy level decisions for the Central Supervisory Board to focus on the approval of regulations. The issuing of guidelines, licensing procedures and the compliance monitoring should be delegated to the appropriate Departments in the MOI and in the case of environmentally critical chemicals or hazardous wastes the ECD.

The concept of Environmental Emergency is not defined in the ECL. From the contents of the duties and powers of ECD and its implementation capacity it is obvious that it cannot have a significant role in dealing with natural disasters. However, the coordinating role of ECD in climate change mitigation and adaptation policy is important. In case of man-made emergencies such as oil spills and chemical accidents ECD could play a key role in identifying such hazards, regulating emergency preparedness and ensuring the consistency of emergency response with hazardous waste regulations.

Recommendations

The following priorities are proposed:

1. Preparation of hazardous waste strategy, Master Plan and HW regulations and HW inventory. Hazardous waste regulations should be issued taking into consideration both the ECL and the chemical law, the mandates of respective Committees and Boards and the obligations of the international chemical conventions.
2. The compiling of the Master Plan for HW management should be followed by an investment

phase for establishing environmentally and economically sustainable treatment and disposal services. Because the HW services would mainly be used by the industry and taking into consideration the significant public owned heavy industry it is recommended that MOI would take a lead role in establishing the HW infrastructure.

3. The regulations for the prevention and control of health and environmental hazards from the production, transport, storage and use and for registration of chemicals in different fields of use should be synchronized between MOI, ECD and the other relevant sector Ministries. The notifications of regulated chemicals should be revised to take into consideration the international chemical conventions.
4. Prepare guidelines for the management of oil and chemical spills and accidents and the management of the HW arising from the emergency response. This task should be performed in coordination with the Central Supervisory Board of the chemical law.
5. ECD and DISI staff will need capacity building and on-the-job support for the inspection and enforcement of HW regulations in industry and service businesses. This needs to be backed up by appropriate capacity to identify and analyse hazardous waste.

4.5 Urban environmental management

Under this topic the focus is on the management of environmental concerns related to urbanization. Major cities have a high degree of autonomy, but ECD has the mandate to set national standards for pollution control e.g. municipal waste and wastewater treatment and ambient standards for air pollution. Issues related to urban land use planning are mainly discussed under theme 4.1.

Regulatory base

Based on ECL, MOECAF has an **advisory role** in the management of urban environment (ECL Chapter XIII, article 17) in 5 specific topics, which are land use planning and zoning, management of construction industry and housing settlements, **wastes and urban pollution control.** The Housing Department under the Ministry of Construction plays a key role in supervising urban planning in more general**.**

The draft list of projects requiring IEE or EIA (based on Environmental Rules 2014) includes all types of solid waste treatment or recycling plants and all types of wastewater treatment plants as activities that need an environmental permit. Also many service and urban development projects and industrial zones are suggested to carry out an IEE or EIA. This gives the ECD the mandate to prepare guidelines for the planning of such urban development projects in coordination with the Ministry of Construction and the City Development Committees. MOECAF has the mandate to set environmental standards for ambient air quality and air emissions as well as standards for municipal or industrial wastewaters (ECL article 7 and 10).

The main source of air pollution in urban areas is emissions from vehicles. Standards for maximum emissions from vehicles are based on the Motor Vehicle Rules (1989). The Road Transport Administration Department is using an exhaust emission test as a condition for the renewal of motor vehicle registration. In Yangon city the renewal registration of cars over 20 years old is prohibited. (SOER draft 2015).

The major cities have their own development laws (City of Yangon Development Law 1990, amended by law No.12/2011 and City of Mandalay Development Law 1992, amended by law No. 13/2011).

In Nay Pyi Taw, Yangon and Mandalay, autonomous City Development Committees and their Pollution Control and Cleansing Departments (PCCDs) and their sub-units are tasked to organize solid waste management within their municipal areas (EPA, 2009). In other smaller urban centres, a central government body (the Department of Development Affairs) is responsible for water supply and sanitation services.

While the government aims at increasing decentralization, including the devolution of duties and responsibilities from the centre to the regions and states, many governance functions remain centralized. Although the Ministry of Construction

is responsible for urban planning, other central ministries still carry out the same functions on lower administrative levels (ADB, 2012b).

Governance practice and capacities

The major cities Yangon and Mandalay have actively pursued their obligations in the field of urban environmental management, especially water supply, solid waste management and gradually also urban wastewater management. Both cities have utilized public-private partnership in developing solid waste collection and disposal. Yangon CDC has chosen a Waste to Energy solution that includes a sanitary landfill with methane gas extraction and a waste incinerator generating electricity. Both contracts are pending on the approval and commitment of the Ministry of Electric Power to buy the electricity.

Municipal wastewater treatment is also entering a period of rapid development. Currently one wastewater plant in Yangon treats about 10% of the generated municipal wastewater and six more plants are planned (interview 27.5.2015).

Mandalay CDC has selected a foreign investor to establish a waste to energy facility consisting of a biogas and a pyrolysis unit. The waste to energy investment is pending on MIC approval. In wastewater treatment the city relies on septic tanks. The septic tank sludge is collected and transported with city owned tank trucks to a sedimentation pond. ADB has financed a feasibility study for a wastewater treatment plant but the investment is pending on the parliament approval for the loan (Interview 13.5.2015).In 2008 the municipal waste collection efficiency in Mandalay city was about 90 % and in Yangon 80%. In the other large towns of Myitkyina, Monywa and Mawlamyine, waste collecting capacity increased to 80%, 90% and 70% in 2008. The performance in smaller towns has stagnated or even deteriorated. (EPA, 2009)

Mandalay City is applying an integrated property tax that includes a fee for solid waste collection. Yangon City is collecting a separate waste fee by door-to-door collection, but it has managed to collect the fee from only 50% of the population that it services, and it covers only a part of the costs. Both cities subsidize waste management services heavily from the city budget. The “waste to energy projects” are expected to reduce the financial burden. Both cities are planning to outsource the collection and transport of wastes to private contractors. The municipal dumping places in both cities are constructed without any environmental safeguards. They receive also industrial waste and hazardous waste without any gate fee.

Waste and wastewater management by the minor cities and townships is quite marginal. Municipal waste is collected in the core areas and dumped in uncontrolled dumping places. The Regional Government or the Regional units of ECD have no plans for developing regional cooperation in waste management. (ADB, 2012b)

Some urban air pollution monitoring has been done in Yangon and Mandalay by the Occupational Health Division under the Ministry of Health since 2008 and in 2012 by the ASEAN Clean Air project. Concentrations of particle matter (PM10) have exceeded the WHO guidelines by more than 100 %, concentrations of nitrogen oxide (1hr) have exceeded the limits slightly and concentrations of sulphur dioxide have been well within limits. This indicates that the main source of pollution is traffic emissions.

The major cities Yangon, Mandalay and Nay Pyi Taw have skilled personnel and budgets for providing basic waste collection services. Municipal waste management consumes a lot of resources, for example in Mandalay the city employs 2000 workers for the daily collection and transport of the waste. In 2008 Mandalay city managed to collect about 90 % of the generated municipal waste, whereas the other major cities collected 70-90% (EPA, 2009). The vehicles used in waste collection and transport are on average old and the transfer stations are primitive and labour intensive.

ECD has 1-2 experts specialized in urban waste/pollution management. At the regional/State level ECD no resources have been allocated for urban environmental management.

Cross-cutting objectives

Climate change impacts threaten the maintenance of urban infrastructure and services and burden

Pollution in a reservoir due to Waste Water from a local Dyeing Industry. *Environmental Conservation Department*

the city administration with additional costs such as flood mitigation and poor water availability

Resettlement areas in Yangon and Mandalay, with an estimated population in the hundreds of thousands represent particular challenges. The urban population in Yangon is currently increasing from migration particularly into Hlaing Tharyar and the northern suburbs. Urban services in these areas are below acceptable levels; for example, the quality of the water supply is poor and there is no functioning drainage network or sewerage in the area.

Piped water supply systems in Yangon and Mandalay distribute untreated surface water from open reservoirs, which may not be considered a safe water source. Recent data for Yangon indicate that water supply coverage remains at about 60%. (ADB, 2012b) The poor neighbourhoods in cities tend to have the least access to services such as water supply, drainage, wastewater and solid waste disposal. They also have the least willingness and ability to pay for the services. Poor sanitation and waste and wastewater management constitute a remarkable health hazard for the population. Inadequate environmental infrastructure, combined with underinvestment in preventative and curative medical care, has contributed to severe health threats across the country. In 2010, the mortality rate of children under 5 years old (66 per 1,000 live births) was considerably higher than elsewhere in southeast Asia.

Ongoing activities by development partners

ECD Pollution Control Division has started the preparation of a National Waste Management Strategy with the support of KOICA. Additionally the EU has been funding capacity building project for solid waste management in Myanmar, implemented by Yangon City Development Committee and the City of Torino, Italy.

ADB is financing feasibility studies for the development of urban infrastructure within the Greater Mekong sub-region corridor towns Mawlamyine, Hpa-An, Myawaddy. Special economic zones are being constructed in all these cities. The project will cover water supply, sanitation and wastewater treatment, solid waste collection and disposal, urban roads and drainage and institutional capacity strengthening. ADB Country Operations Business Plan for 2015-2017 has been allocated 140 M$ and an additional co-financing of 84 M$ for construction of potable water and wastewater treatment plants, sanitary landfills and storm water drainage systems. (ADB 2014)

The Golden Dowa Eco-System Myanmar Co., Ltd. is building an industrial scale waste treatment facility including landfilling, intermediate treatment, collection and transportation, and recycling in the Thilawa Special Economic Zone with an investment of USD 36 million. Recycling of waste is mainly left to the private and informal sector. In Mandalay the recycling companies form a cluster of businesses employing about 2000 workers. The recyclable waste is collected from door-to-door by waste hawkers who sell the waste to the dealers. It will then be sorted by quality, packed and supplied to the industry.

Solid waste recycling is a source of livelihood for few thousands of people and their families in big cities. At the municipal landfill waste pickers make their living by collecting recyclables from the mixed waste and selling them forward. The city administration has very little activity in promoting recycling. In Yangon there are some small scale source separation and community level composting projects. In Pyay city one NGO is promoting

the education of street children and financing its activities by installing collection bins for recyclables. It promotes environmental awareness of the population encouraging them to separate their waste at the source.

For reducing vehicle emissions the Ministry of Energy and the Road Transport Administration Department are promoting the use of Compressed Natural Gas in city transportation. Myanmar participates in the project "Clean Air for Smaller Cities in the ASEAN Region (2009 – 2015)".

Gaps and needs

Solving the problems of urban pollution in Myanmar requires proper planning and implementation capacity of the staff responsible of the sector.

Solid waste collection and disposal has obviously improved considerably in few principal cities during the last decade, but remains unsatisfactory in the majority of small towns and settlements (EPA 2009). Appropriate waste management is crucial in maintaining attractiveness of the country for international tourism. This was clearly identified as a priority for development in Bagan (Bagan workshop conclusions 2015).

Unmanaged solid waste contributes to clogging urban drainage infrastructure and increases risks and damages of flooding. Waste disposal is currently based on open dumping without any environmental safeguards. Dumping places have been established without any environmental impact assessment and they are often located near to residential areas.

Mandalay and Yangon are in the process of transforming their present disposal strategy into new Waste to Energy solutions provided by international contractors. These solutions may entail technical risks and also financial risks, in case the collection of considerably higher waste fees will fail. Waste recycling will be left to the private sector also in the future. Conversion of organic waste into an organic fertilizer is practiced only on a pilot scale.

ECD has started two highly relevant planning processes – preparation of the National Waste Strategy and the development of the HW management regulations and Master Plan. It is important to engage the experts from Yangon and Mandalay city and the experts in industrial and construction waste management from the corresponding ministries and private sector in this work.

Recommendations

1. Environmental concerns should be mainstreamed into urban planning regulations and guidelines issued by the Ministry of Construction (Department of Human Settlement and Housing Development), Ministry of Transport and other relevant sector ministries. The issues include zoning of activities, traffic planning, green area planning, water safety, waste management and wastewater management.
2. The approval of the National Waste Strategy should be followed by an action plan. There is a need to develop waste management models for small towns and to disseminate the experiences from pilot towns throughout the regions and states. Because of the high organic content of municipal waste, biogas generation and production of organic fertilizers should be considered as priority option.
3. The management of septic tank sludge should be included in the urban waste management plans. Low-cost, labour intensive technology is preferred, but to limit the number of dumping places regional level waste plans are needed. The regional NEC could play a coordinating role in the regional development of urban waste management.
4. Cooperation with private sector recycling businesses and environmental and social NGOs and CBOs is important for maximizing resource recovery and employment opportunities.
5. In the medium and long term, the wastewater treatment of urban settlements has to be improved. Affordable technology should be used to reduce the emission of organic load, nutrients and faecal bacteria into the environment. Soft financing of the investments and capacity building for the operation and maintenance of the sewer network and the treatment facilities are needed. This work has already started in the big cities and the major regional/state level cities. More support is needed to expedite the development in the smaller towns, which lack financial resources, planning capacity and technical knowhow.

6. City development committees should identify the range of actors (e.g. community and religious leaders) and organisations (such as local NGOs and CBOs) to cooperate with in raising environmental awareness (e.g. separation of wastes) and provide access to information about the state of relevant environmental indicators (e.g. water safety, air pollution). Evaluations of ongoing activities would support learning and the spread of good practice.

4.6 Economic mechanisms in environmental protection

The economic mechanisms of environmental protection range from fees collected for various activities and services to conscious efforts to alter behaviour using economic incentives.

Regulatory base

There is a partial legal basis for the use of economic instruments in Myanmar. According to the ECL Chapter 4 Section 7 the task of the Ministry includes ”managing to cause the polluter to compensate for environmental impact, cause to contribute fund by the organizations which obtain benefit from the natural environmental service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works.” Section 8 mandates the Ministry to establish an Environmental Management Fund in the Union Budget that can be used to cover costs of emergency actions.

According to the ER (Notification 50/2014) the Ministry shall establish the environmental management fund with incomes including those obtained through “compensation by the polluter under sub-section (o) of section 7 of the Law and rule 30, and contribution to environmental conservation fund by the organizations which obtain benefit from the natural environmental service system and contribution to environmental conservation works funds a part of benefit from business which extract, trade or use the natural resources.”

Sections 26 and 27 of the ECL specify the need for an environmental insurance in case of accidents with environmental consequences. There are also provisions that allow the use of administrative fines in cases of non-compliance.

The regulatory base lacks provisions on how to cover the administrative costs for the handling and approval of permit applications, EIAs and monitoring. There are also no detailed provisions on pricing mechanisms for environmental burden or tradable emission permits.

The Protection of Wildlife and Conservation of Natural Areas Law does provide a mechanism for compensating individuals or businesses who have existing rights to the land under relevant land acquisition laws (Article 8), and allows the Director General of the Forest Department to “make provisions for reasonable rights and privileges in respect of the affected rights of the people in the region” where the natural area is established (Article 11).

Governance practice and capacities

Currently the application of economic instruments is in its infancy and the experiences of the use of the available instruments are limited. In some cases MIC has demanded companies to pay 1-2 % of their profit for community support, but there are no statistics on this mechanism and its implementation is problematic as profit is poorly defined. The Ministry of Mines has adopted the concept of compensation for prospecting/production and regions have received revenues from taxes on extracting minerals, with the highest sums amounting to nearly 30 000 USD in Sagaing (Lynn and Oye, 2014). Similarly regions receive tax revenues from forest extraction. The sums are in general higher than those for mining, with the highest revenues in Ayerarwady with nearly 360 000 USD (Lynn and Oye, 2014).

For specific activities such as waste management fees are collected in various forms. For example in Mandalay a waste tax is collected as part of the property tax, but the waste tax covers only a small portion of the annual budget for waste management in Mandalay (interview Mandalay City PCD 13.5. 2015). In Yangon a door to door collection has been used for waste management (Interview Yangon City PCCD 27.5. 2015).

The National Sustainable Development Strategy of 2009 suggested that pricing for water should be introduced to encourage greater efficiency. Registration fees for activities are generally low. There is currently no system for collecting fees for the administrative procedures according to the ECL.

There are still limited experiences in the application of economic instruments in Myanmar and the collection of fees appears to collect only a fraction of the true costs. Taxation of firms has been found to be confusing and variable (Bissinger and Maung,, 2014). There is also a lack of comprehensive statistics on the use of economic instruments.

Cross-cutting objectives:

Issues of equality and poverty arise in the use of economic instruments. The design of the instruments is therefore critical for issues of equity and fair burden sharing. Economic instruments can also be important in ensuring fair and equitable sharing of benefits from the use of natural resources.

Ongoing activities

Discussions are going on concerning the environmental fund and recommendations have also been made concerning the development of, for example, taxation of businesses. These suggestions have mainly arisen from an economic perspective. In the connection of developing water and waste management in the largest cities issues related to the fees and systems for collecting fees will arise.

In several regions demands for benefit sharing have been raised and various models have been presented. There are issues about the share that the developer should provide and also on the split between the central government and regional and local administrations (Oye 2014, Lynn and Oye 2014).

Gaps and needs

There is a need to develop the application of economic instruments further. Economic instruments for pollution control and natural resource management are an increasingly important part of environmental policy in many parts of the world. In developing the instruments there is a need to consider the full range of instruments including environmental taxes, fees and charges, tradable permits, deposit-refund systems and subsidies.

Recommendations

1. Explore and develop principles and processes for the collection of revenues to cover the costs of waste management, water supply and treatment. Equitable and legitimate systems for the collection of revenues are essential in order to ensure adequate financing while at the same time avoiding adverse social side effects.
2. Establish a system for collecting fees to cover the administrative costs of handling IEEs, EIAs and EMPs. A fee system is essential to fulfil the polluter pays principle and in order to collect funds for developing capacity and the systems for handling applications. For example, according to the Hong Kong EIA ordinance, charges for the approval of a full EIA report is in the order of 5000 USD, and an application to change conditions in an environmental permit is about 1000 USD.
3. Explore systems for benefit sharing concerning natural resources (hydropower, mining, oil and gas, agro-industrial land concessions, forestry, climate change mitigation schemes such as REDD+). The regions in Myanmar have presented different models and there is thus a need to identify a transparent system that is felt to be legitimate by the local inhabitants affected by the interventions, authorities, investors and CSOs alike.
4. Develop environmental taxation. In the European Union environmental taxes accounted for 6.17 % of all revenues from taxes and social contributions in 2011.[9] The experiences of different countries can be used as a base for developing a taxation system that is equitable, legitimate and enforceable. The statistics on the use of environmental taxation and other economic instruments should be developed.

9 http://ec.europa.eu/eurostat/statistics-explained/index.php/Environmental_taxes_-_detailed_analysis

4.7 Conservation of natural resources, biodiversity and cultural heritage

Regulatory base

One of the objectives of the ECL (Chapter II, objective d) is "to reclaim ecosystems as may be possible which are starting to degenerate and disappear". The duties to "carry out the conservation, management, beneficial use, sustainable use and enhancement of regional cooperation as regards [...] natural ecosystems as well as natural areas, wildlife, natural plants and biological diversity", are delegated to "the relevant Government departments and Government organizations" (ECL, Chapter IX, section 18). MOECAF is assigned a duty to "cooperate with the relevant Government departments and Government organizations in the matters of environmental conservation for perpetual existence of cultural heritage sites and natural heritage sites, cultural monuments and natural areas stipulated under any existing law" (ECL, Chapter IX, 19) and "provide necessary technologies to the relevant Government departments and Government organizations in implementing the matters contained in section 18 and 19" (ECL, Chapter IX, section 20).

Chapter X, Sections 47-49 of the Environmental Rules (draft, 2015) define the coordination and oversight role of the ECD in matters related to the conservation of natural resources and cultural heritage. This includes coordinating "proper land use planning for the conservation of natural resources and cultural heritage" (Chapter X, Section 49). Furthermore, MOECAF could assign a duty to "implement the policies, orders, work programmes and guidelines relating to [...] biodiversity conservation" to the ECD (Env. Rules, Chapter III, Section 21). Also the NECC may participate in "... carrying out the conservation and safeguarding of endangered species and rehabilitation and regeneration in the habitats" (Chapter III, Section 8). Section 35 of Chapter V of the ER stipulates that the funds of the Environmental Management Fund, defined in the ECL, may be used towards biodiversity conservation.

Preceding the ECL and Environmental Rules, the sectoral legislation governing the conservation of biodiversity and natural heritage is the Protection of Wildlife and Conservation of Natural Areas Law (1994). The conservation of species and habitats according to that law is defined as the duty of the ministry under the Minister of Forestry, i.e. MOECAF. The law is supported by the Rules Relating to the Protection of Wildlife and Conservation of Natural Areas (2002). The Forest Law (1992), Forest Rules (1994) and Forest Policy (1995) govern the establishment of reserved forests to sustain ecosystems and biodiversity. The 30-year Forest Master Plan (2000) sets the target of protected area coverage to be 10% of the total land area of the country. The Protection of Wildlife and Conservation of Natural Areas Law gives limited attention to fish and marine species, while these are regulated by the Marine (1990) and Freshwater (1991) Fisheries Laws.

The conservation of cultural heritage is governed by the Protection and Preservation of Cultural Heritage Regions Law (1998). The Ministry of Culture is in charge of demarcating and acquiring land for cultural heritage sites, regulating their protection and preservation, controlling smuggling of antiquities, and educational work related to cultural heritage. The ministry may grant a prior permission for renovation, hotel or road construction works within a cultural heritage region. Drilling petroleum, natural gas or mining precious stones or minerals in a cultural heritage region "for the benefit of the State", although otherwise prohibited, is subject to the Government approval (Protection and Preservation of Cultural Heritage Regions Law 1998, Chapter IX, Section 29). Any business which can affect [ ] and antique heritage are also restricted or prohibited by Myanmar Citizens Investment Law (2013 and the Foreign Investment Law (2012). Under the ECL, MOECAF only plays a cooperating role for conservation and management of cultural heritage and ECD does not have a clear mandate in this aspect.

The draft EIA Procedures, Annex 1, paragraph (h) state that an EIA is required in all cases where the project or activity will be located in or will have foreseeable adverse effects on any legally protected national, regional or state area, including without limitation: (i) a forest conservation area

(including biodiversity reserved area); (ii) a public forest; (iii) a park (including marine parks); (iv) a mangrove swamp; (v) any other sensitive coastal area; (vi) a wildlife sanctuary; (vii) a scientific reserve; (viii) a nature reserve; (ix) a geophysically significant reserve; (x) any other nature reserve nominated by the Minister; (xi) a protected cultural heritage area; and (xii) a protected archaeological area or area of historical significance.

The National Environmental Policy (1994), Myanmar Agenda 21 (1997) and the National Sustainable Development Strategy (2009) explicitly promote the conservation of natural resources, biodiversity and cultural heritage. The main document guiding biodiversity conservation planning is the National Biodiversity Strategy and Action Plan (NBSAP, 2011), developed as part of Myanmar's obligations towards the CBD. The NBSAP is currently being updated with new information and to include national counterparts to the global Aichi Biodiversity Targets. These targets are designed to mainstream biodiversity and sustainable use across all sectors and to address both the direct and underlying drivers of biodiversity loss and degradation.

Policy instruments developed for increasing the sustainability of forestry and mitigate climate change, namely FLEGT and REDD+, have the potential to create co-benefits for the conservation of biodiversity and ecosystem services more broadly.

ECD is a focal for Nagoya protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization (ABS) and initiating to draft a road map towards developing national ABS legal framework. Myanmar National Biosafety Framework was prepared by Ministry of Agriculture and Irrigation (2006) and currently, the development of the Biosafety Law is under the responsibilities of MOECAF. Meanwhile, the MIC permits some economic activities for Foreign investments with the recommendation of MOECAF including 1) Import, multiplication and sale of genetically modified organism and living modified organism; 2)Technical research and business related to breeding, culture and production of genetically superior quality seeds, propagates, tissues, etc. of valuable and rare flora species; 3) Importing, exporting, breeding and production of wild flora and fauna species for commercial purposes. It is not obvious that the Myanmar Investment Commission (MIC) is the best body to act as a permit authority permitting these three economic activities for foreign investment with MOECAF only providing recommendations for the decision. Leaving the ultimate decision making to MIC would require considerable development of its expertise in dealing with substance issues.

According to the Organization structure of Biosafety framework (Third draft), National Competent Authorities (NCAs) are the highest decision making authorities and the National Biosafety Committee (NBC) is the advisory body to the NCA for decision making for handling of Genetically Modified Organism (GMO) and Living Modified Organism (LMO). Depending upon the type of GMO concerned; Ministry of Agriculture and Irrigation will be responsible for release decision related to crops, Ministry of Livestock and Fisheries will be responsible for fish and livestock. (MIC Notification 49/2014). More specific rules/guidelines are necessary to deal with such economic activities.

Governance practices and capacities

Within MOECAF, the Nature and Wildlife Conservation Division of the Forest Department is in charge of biodiversity conservation issues and protected area management. The focus of biodiversity conservation has been the expansion of the protected area network to reach the 10% of land area target, extending to 5.6% by 2010 and comprising 37 protected areas representing mainly terrestrial ecosystems (95% of protected area) in various parts of the country. Recent studies around protected areas show that forest cover change outside of the protected areas has been greater than within them (Htun et al., 2010; Songer et al., 2009), suggesting that these are not merely "paper parks" (NBSAP, 2011; Nature and Wildlife Conservation Division, 2015). Still, numerous challenges remain to achieve effective conservation of natural resources and biodiversity in the country, and it is unlikely to be achieved through the protected areas alone.

The cross-sectoral nature of drivers of environmental change (see section 1.2), compared with the largely sectoral legislation and siloed institutions governing natural resources, calls for an effective operationalization of the inter-institu-

tional coordination and cooperation determined in the ECL. Despite the inter-ministerial coordination committees in various sectors as well as the NECC, in practice inter-sectoral coordination in natural resource management is still perceived to be weak. Ministries and departments responsible for acute environmental challenges such as forest degradation, water resources management and the sustainability of agriculture are statutorily separate from the NECC, and decision-making and environmental protection efforts continue to be undertaken primarily on a sectoral basis (Kattelus et al., 2014). Conflicting interests within the government regarding natural resources-led development versus conservation and sustainable use of natural resources play out as competition among sectoral ministries. MOECAF's long-standing authority in forestlands is being challenged, as forestlands are being carved up into agribusiness concessions under the authority of the Ministry of Agriculture and Irrigation, thus presenting new territorial, institutional, environmental, and social challenges (Woods, 2015).

The call for improved inter-sectoral coordination is accentuated regarding cross-cutting mechanisms such as the EIA. Despite the multi-agency EIA Review Committee, the biodiversity impacts of e.g. hydropower development, offshore oil and gas development and plantation concessions are currently inadequately addressed, and are not sufficiently considered in the EIA draft procedures. Insufficient attention to biodiversity aspects in development projects is aggravating human-wildlife conflict in rural areas, as displaced animals such as elephants are forced to seek new migration routes, and compromising the achievement of conservation goals related to threatened and endemic species (meeting with the Nature and Wildlife Conservation Division, Forest Department, MOECAF, April 29, 2015). It should be noted that the format of the EIA process adopted in Myanmar by default limits the mitigation of biodiversity impacts, since alternative approaches are not considered but only impacts of development in the planned location are assessed.

The weak inter-sectoral cooperation and capacities are particularly evident at the subnational (regional and local) level where EIA assessments are conducted. The National Biodiversity Strategy and Action Plan has not been operationalized within the different sectors and is not effectively implemented at the subnational levels. Relevant baseline information across the sectors is not easily accessible. In the absence of national standards, companies conducting EIAs are mainly using different international standards, resulting in variation in the degree to which biodiversity aspects are considered in the process (private sector workshop, Yangon, May 25, 2015). An even greater concern is the limited capacities of the central government ministries and the subnational governments (state/region/township) to control natural resource exploitation in the ethnic states. Weak horizontal and vertical coordination will constrain the effective adoption of new policy instruments that are essentially cross-sectoral and multilevel by nature, such as REDD+.

Capacities and resources

The current Nature and Wildlife Conservation Division staff is 650 for the whole country, of which 50 are stationed at the division main office in Nay Pyi Taw while the rest work at the 20 park headquarters distributed across the country (meeting with the Nature and Wildlife Conservation Division, Forest Department, MOECAF, 29 April 2015). Expenditure on conservation is among the lowest within the Forest Department, while nearly half of the funds are spent on natural forest and plantation management and over 40% on general administration (unpublished Forest Department data on expenditure 2013-2014).

ECD has a limited database regarding natural resources management compared to the Forest Department. Although ECD has a regulatory mandate on permanent forest estate, due to their capacity and resource constraints the Forest Department is still managing the EIA for plantation concessions (meeting with the Forest Department, MOECAF, Nay Pyi Taw, 29 April 2015). Especially the recently established sub-national offices of the ECD (2014-2015) are still grappling with limited resources and are not fully operational.

Despite the formal centralization of natural resource governance in Myanmar (see section 3), the central government departments have limited capacities to control the extraction of natural re-

sources in the states, especially along the Chinese border and in the conflict areas (Woods and Canby, 2011).

Cross-cutting objectives

One of the greatest challenges for Myanmar is balancing development based on the exploitation of natural resources and their conservation, as well as sharing the related benefits in an equitable and just manner. The majority of the population are smallholder farmers living in the countryside, directly depending on land and forests for their livelihoods. The sustainability of rural livelihoods is currently threatened by smallholder farmers being displaced from their land due to granting of large-scale land concessions. Unless issues relating to land tenure security and land conflict are seriously addressed, they could have negative impacts on foreign direct investment, sustainable economic growth and environmental protection, in addition to the adverse effects on rural livelihoods and the development of democratic governance (Oberndorf, 2012; Webb et al., 2014).

To that end, as previously mentioned, the government has initiated the drafting of a comprehensive land use policy. The land laws approved in 2012, Farmland Law and Vacant, Fallow and Virgin Lands Management Law include some improvements in terms of recognizing customary use of land by smallholders, but provide insufficient protection of customary rights and remain designed primarily to foster promotion of large-scale agricultural investment. The land policy should provide mechanisms for communal tenure to ensure the rights of ethnic minority populations are protected, secure their participation in decision making processes relating to land, and provide fair and transparent dispute resolution mechanisms for handling land conflicts (Oberndorf, 2012). A Free Prior Informed Consent (FPIC) procedure is recommended to be included in the land policy, but care will need to be taken in its operationalization, given the overall challenges of low capacities and access to information at the local level, opaque governance and power asymmetries that may affect the outcomes of ostensibly participatory processes (CSO workshop, Yangon, 22 May 2015).

In particular, women's land rights remain weakly protected in the law, as women do not enjoy equal rights to register and inherit land or be granted new land-use rights (Oberndorf, 2012). Their position is thus especially vulnerable when it comes to conflicts over land and natural resources, and in seeking compensation and redress for lost access to resources in case of displacement. These gendered effects are easily multiplied as far-reaching consequences for families, communities and the society through marginalization and impoverishment. On the contrary, strengthening women's procedural as well as material rights to resources may increase production and economic performance, and improve the legitimacy and sustainability of natural resource governance.

In many countries, recognition of communal forms of tenure (of e.g. land, forest, fisheries, etc.) has enabled the development of community-based natural resource management schemes to enhance the equity, effectiveness and cost-efficiency of environmental governance. In Myanmar, community forestry is being developed, and similar models could be expanded to concern other resources. Currently, there are very few community-based conservation areas and the involvement of local communities in the management of government protected areas and ecotourism initiatives is limited to involvement in patrolling activities. Current budget cuts are said to limit the development of new joint management schemes with local communities (meeting with the Nature and Wildlife Conservation Division, Forest Department, MOECAF, 29 April 2015).

Ongoing activities by development partners

The Protection of Wildlife and Conservation of Natural Areas Law (1994) is currently being revised, pending submission to the parliament for approval. The National Biodiversity Strategy and Action Plan is currently being revised for the Aichi targets, with support from IUCN. The revision was due by July 2015.

A national land use policy is being drafted through a consultative process. Forest Department is currently updating the 10 years' District Forest Management plan. A REDD+ roadmap has been developed as part of Myanmar's REDD+ readiness preparation with support from UNDP. Community

Forestry Instructions are being updated to enable commercial community forestry.

Gaps and needs

The key needs as regards cooperation in conservation of natural resources and cultural heritage, including protection of biodiversity, may be summarized as follows:

The law assigns a coordination role in the conservation of natural resources, biodiversity and cultural heritage to MOECAF and to an extent to the ECD (according to the Environmental Rules), but the intra- and inter-organizational relationships and operational system for the coordination is unclear. In practice cross-sectoral coordination is perceived to be weak, especially noticeable as regards EIA implementation, land management and biodiversity conservation. Improving public participation and the capacities of regional and state governments in the governance of natural resources is of the essence to achieve sustainable environmental management. Legitimacy (social acceptance), equity and cost-efficiency of natural resource management may be improved by extending community-based approaches from forestry pilots to concern other natural resource sectors.

Recommendations

1. Clarify the duties and powers of the ECD in relation to coordination of the conservation of natural resources, biodiversity and cultural heritage, from those of the Forest Department and other MOECAF departments, as well as the obligations of other sectoral ministries and agencies to actively contribute to the coordination. Define the mechanisms to operationalize coordination and support, and ensure adequate funding and human resources with appropriate technical capacities to implement them.
2. Incorporate assessment of impacts on biodiversity and the obligation to define measures to mitigate them in the EIA procedures.
3. Building on available research an assessment of the social, economic and environmental performance of the Community Forestry programme should be carried out to distil recommendations to expand the concept to other natural resource sectors. Specific attention should be paid to the impacts on marginalized groups, such as ethnic minorities and women.
4. Consider the administrative responsibilities related to biosafety and biosecurity, and develop specific guidelines/rules to deal with investment activities which are related to them, including an ecological risk assessment to reduce the invasion risk of alien species in Myanmar.
5. Strengthen capacities to prevent and deal with human-wildlife conflict, including human resources, training and adoption of appropriate mitigation measures such as natural and man-made wildlife corridors.

4.8 International environmental agreements and programs

Regulatory base

Myanmar is party to several environmentally relevant international agreements (see Chapter 3.4. for international agreements). The degree to which the provisions of these agreements have been implemented in national legislation varies between the different agreements.

One of the stated objectives of the ECL is to promote international, regional and bilateral cooperation in matters of environmental conservation (Chapter II, Section 3(g)). Consequently, Chapter IV of the ECL on duties and powers of the Ministry assigns the responsibility of negotiating, cooperating and implementing in respect of international, regional and bilateral agreements, instruments and programmes relating to matters of environment (Section 7(k)) and further implementing the international, regional and bilateral agreements accepted by Myanmar for environmental conservation and enhancement of environmental quality in accord with the guidance adopted by the Union Government or the Committee (Section 7(l)). The duty to lay down guidance relating to a number of areas relating to environmental management in Section 7(n) is to some degree based on the requirements resulting from Myanmar's obligations under various international environmental

agreements (see section 3.4). One example of such guidance is related to the handling and management of hazardous substances defined in Articles 20, 25 and 26(f) of Chapter III of the Environmental Conservation Rules.

Chapter IV of the Environmental Conservation Rules defines a role for the Environmental Conservation Committee to assign to the Ministry to participate in international, regional and bilateral agreements and instruments and coordinate on associated matters relating to environmental conservation (Section 27). The role of the Committee is coordinate, discuss and cooperate with relevant government departments and organisations on the implementation of such agreements and instruments (Section 28).

Governance and capacities

Detailed analysis of the various international environmental agreements that Myanmar has joined and is actively pursuing to join in the future and the associated capacities and resources has not been possible within the scope of the assignment.

Participation in the international agreements may bring benefits for the environmental practice as a form of capacity building and also by providing access to good practice elsewhere. At the same time participation may drain scarce resources for domestic work. Balancing the two is an important task.

Ongoing activities

Myanmar is currently implementing a number of international environmental conventions as well as actively pursuing ratification or accession to additional conventions. Details of the status of Myanmar's participation in some key regional and international environmental conventions in July 2015 is included in Appendix 5.

ECD is currently receiving support from development partners on the implementation of some international conventions related to air pollution (UNEP and UNIDO), implementation of the Stockholm Convention of persistent organic pollutants (GEF) and climate change (UNEP and GEF). Additional support on implementation of the Basel Convention on hazardous waste has been agreed (Norway).

Gaps and needs

Whilst activities are currently ongoing, support continues to be needed in the implementation of international environmental agreements in particular in areas of climate change and air pollution, waste and hazardous substances and biodiversity. Active ratification and accession processes highlight areas where future resources are needed for national implementation of the provisions of international treaties as well as meeting the obligations resulting from the international agreements. Implementation of the conditions of international treaties nationally requires capacity in drafting necessary legislation as well as implementing such national instruments. The technical capacity required to manage the implementation of international agreements may be significant, as well as the time demands for government officials to report and attend meetings related to the international conventions.

There is a lack of capacity among Myanmar government officials to negotiate international agreements. This applies both to negotiation capacity regarding implementation of existing agreements as well as design of new agreements and amendments to existing agreements. Capacity needs include language skills, negotiation skills and technical skills concerning the topic areas concerned by the agreements.

Recommendations

1. Find suitable modalities to avoid unnecessary burden on administration, e.g. in attendance of COP meetings through capacity building and delegation of responsibility.
2. Enhance existing and where necessary, establish additional procedures for collaboration across sectors on implementation of international agreements, including effective use of the NECC.
3. Ensure sufficient resources and support for development of necessary national legislation to implement provisions of international treaties, including assistance on technical aspects on implementation.

4. Seek collaboration with other parties to international agreements and learn from international best practice.
5. Explore critically benefits and drawbacks in joining further international environmental agreements to further strengthen the legal framework for environmental protection. Examples include the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade or the Minamata Convention on Mercury as well as regional agreements to enhance cooperation on environmental protection. Drawbacks are related to the administrative burden that agreements may bring.

4.9 Awareness raising, information management, research, dissemination and training

Regulatory base

The ECL emphasizes environmental information. One objectives of the ECL is "to enable to implement for promoting public awareness and cooperation in educational programmes for dissemination of environmental perception" (ECL Chapter 2, Section 3f). ECD has the powers to carry out organization education and activities relating to environmental conservation and to propose the inclusion of environmental conservation lessons in school curriculums in coordinating with the relevant departments (ECL Chapter 3, Section 5a and 5b). ECD has a clear mandate on enhancing environmental awareness, training and research. Regional ECD staffs are very active in area of providing environmental awareness to schools (Discussion with regional ECD).

In Chapter VII (13) a comprehensive monitoring system is foreseen to be implemented by the MOECAF or in coordination with relevant Government departments and organizations to cover widely emissions and other sources of pollution. The rules according to notification 50/2014 give the ECD a task to prepare and publish state of the environment reports for the whole country or regions (26, i j).

Governance practices and capacities

Several CSOs are active in raising environmental awareness. The CSO workshop provided several examples of innovative efforts at different level. Among authorities, the management of environmental information related to environmental conservation is being developed, but the systems for handling environmental information are still limited. There is no comprehensive repository for environmental information and no system that would ensure the accumulation of information from monitoring or inspections. Some international databases cover conditions in Myanmar. For example the FAO has collected information that is available in digital form[10] but the data is partly outdated.

Some local environmental authorities have monitoring equipment for, e.g. air quality and water quality, but in general the capacity for systematic monitoring of environmental variables is modest. Both workshops organised for this project and several interviews underlined the lack of baseline information and poor access to available information as important obstacles. There is, for example, no register of activities that would be accessible to the different authorities and that would include information on environmentally significant activities, their emissions or environmental protection measures in place.

There are a number of CSOs that have capacity for specific areas of environmental research and monitoring and in the context of EIAs detailed information on the environmental matters is collected for specific sites and projects. The lack of a centralised repository for this information, or even information about the existence of the data, means, however, that available data is not optimally used and there may even be duplication of work. ECD needs to work effectively with such CSOs/NGOs and ensures the collaborative and coordinative efforts among CSOs/NGOs as a central steering committee.

Research and training is concentrated to research institutes and universities (Table 6). In addition training is offered by government departments and also civil society organisations.

10 http://www.fao.org/nr/myanmar/page4_en.htm

Table 6: Universities and governmental research institutes

University/Research Institute	www	Focus
Yezin Agricultural University	http://www.yaummr.org/about_yau/introduction.php	Agricultural and rural development
University of Forestry	http://www.fdmoecaf.gov.mm/eng/about_university/university-forestry	Environmental conservation and natural resource management
Yangon Technological University	http://ytu.edu.mm	Master degree programs in Environmental engineering, environmental planning and management
Yangon University of Distance Education	http://www.ynou.edu.mm/public	Environmental Law and related legislations; International regulation for environment
University of Yangon	http://www.yufund.org	Master degree program in Environmental studies, Environmental aspects in several departments
University of Mandalay	http://www.mu.edu.mm	Solar Energy and Sustainable Energy, Environmental Science
Forest Research Institute, Ministry of Environmental Conservation and Forestry	http://www.fdmoecaf.gov.mm/eng/research-data	Natural resource conservation, forestry
Department of Agricultural Research, Ministry of Agriculture and Irrigation	http://www.researchgate.net/institution/Department_of_Agricultural_Research-Myanmar	Soil test, Agricultural research
Urban Research Institute, Ministry of Construction	https://www.facebook.com/pages/Urban-Research-and-Development-Institute/728092360546203	Support for Ministry of Construction, Department of Human Settlement and Housing Development: urban and regional development and training activities
Department of Meteorology and Hydrology, Ministry of Transport	http://www.dmh.gov.mm	Meteorology, hydrology, disaster risks management, support for sustainable development

Ongoing activities by development partners

Some regional environmental bodies have received donor support for developing their environmental monitoring capabilities. For example JICA has supported the development of air quality monitoring. Capacity building projects for GIS systems are also ongoing.

A Myanmar Environmental Information Portal (MEIP) has been created with support from the ADB and is hosted by the MOECAF[11]. ADB is investing an additional 300 000 USD in the development of an environmental database. The MEIP covers the key sectors (general environment, industry development, infrastructure, energy, minerals, marine and coastal resources, forests, agriculture and livestock, urban environment, water, biodiversity, atmosphere and climate change, economic development, people). The contents and updating of the portal is still incomplete and in the process of being developed.

Several universities teach environmental topics as part of the education offered (Table 5) and also co-operate with foreign universities. CSOs are actively engaged in awareness raising projects.

Gaps and needs

Functioning information management, dissemination, training and supporting research are essential for the effective implementation of environmental policies. Priority needs include the following:

1. There is an urgent need to raise environmental awareness at all levels of society
2. The management of all information concerning environmentally significant activities needs to be expanded and made more accessible. There

11 The Myanmar Environmental Information Portal http://http://www.gms-eoc.org/myanmar

is a need for reliable and regularly updated information on environmental policies as well as specific information on projects and the stage of their application processes, including information on the approved EPM and permit conditions. Such a system would provide essential information for strengthening and enforcing inspections as well as participatory processes.

3. The management of information related to the state of the environment at national and local level needs to be considerably strengthened. The task of preparing state of the environment reports, EIAs and IEEs would be greatly assisted by a portal that would provide access to available data and that would provide a repository for accumulating monitoring data and also data provided by, for example, EIAs. Currently there is a lack of shared database system and the access to research documents and literature is not convenient for the public.
4. There is a need for a research institute with broad responsibilities for developing environmental research in Myanmar. While Myanmar has governmental research institutes/universities for forestry, agriculture and hydrology and meteorology. These universities/institutes provide environmentally related courses, research collaboration among the universities and institutes is limited. With current development and the specified demands for comprehensive state of the environment reports that build on sufficient monitoring of polluting activities, information on land use changes and evaluation of environmental policies, there is a need to develop a body that could take the lead. Such an institute would also be the focal point for the environmental information management, the maintenance and development of environmental data bases, including GIS-based tools.

Recommendations

1. An ICT-based system for managing information related to environmentally significant activities should be established. It should be accessible for all authorities dealing with environmentally significant activities such as all polluting industries, power plants, mining activities, wastewater treatment facilities and waste treatment facilities. It should be established in co-operation between MOECAF, Ministry of Industry, Ministry of Mines, MIC, DICA and other authorities involved in managing and inspecting installations. It should build on existing systems and databases that Ministries have developed and continue to develop independently, but interoperability should be a key criterion for all future information management.
2. The Myanmar Environmental Information Portal should be updated and its contents expanded. It should provide links or direct access to information on the state of the environment gathered in conducting, for example, EIAs. It should also provide links to the ICT system suggested in recommendation 1 in order to inform also the public about environmentally significant activities. Care should be taken that adequate funding is available for the maintenance of the portal.
3. Establish a centre for environmental research in Myanmar either by creating a new institute or expanding the mandate of existing ones. Such an institute would open new possibilities for developing environmental research in Myanmar and provide support for further policy development in the environmental field. One of its tasks should also be to bring together fragmented environmental research activities in Myanmar's universities and to co-operate with related institutes internationally. Part of the funding could be based on external funding that can be gained in competitive bidding.

4.10 Access to environmental justice

Public participation and access to environmental justice are important for the efficient implementation of environmental policies (Bruch, 2002).

Regulatory base

The ECL does not provide access to environmental justice for the public as part of the licensing procedure. There is no regulation for appeals. Chapter XIV section 36 weakens access to environmental justice by granting the Ministry a mandate to "with

the approval of the Union Government, exempt or relieve any Government department, organization or private business from complying with any provision contained in this Law for the interests of the Union and its people." The importance of the state-owned enterprises in the Myanmar economy indicates a risk that environmental inspection and enforcement in these companies may be challenging for the inspectors.

Governance practice

There is no governance practice for appeals. Instead citizens and developers can file grievances and complaints that the regional offices of ECD will have to deal with on a regular basis.

Ongoing activities by development partners

ABD's project R-CDTA 7735: "Building Capacity for Environmental Prosecutors, Adjudication, Dispute Resolution, Compliance, and Enforcement" is starting in Myanmar in 2015. It aims at strengthening the courts' capacities in environmental cases and capacity building in the judiciary and the police force in matters pertaining to investigation and prosecution of environmental crimes.

Recommendations

Access to environmental justice for all stakeholders in environmental matters should be improved. This will require a dedicated project to chart all relevant areas of public participation in order to specify the context for further development of participation and environmental justice. Systematic work to adjust relevant legislation to allow for participation and appeals should be initiated.

Cooperation between environmental authorities, the judiciary and law enforcement should be strengthened, especially in cases where administrative instruments are not enough to ensure compliance. Litigation of environmental criminal cases requires knowhow of environmental regulation and environmental science.

5. OVERVIEW OF CURRENT DEVELOPMENT PARTNER PROJECTS

The ESWG has identified more than 60 recently completed, ongoing or planned donor projects related to environmental topics. The greatest number of projects (21) has been classified to deal with Environmental Governance and Legal/Normative aspects (including environmental safeguards, standards and institutional strengthening). Projects with a focus on environmental conservation and protection (land use, water resources management, solid waste management, local mobilization and engagement) are also common (Figure 6). The list of projects is not complete as some development partners have not participated in the ESWG. There are also general development projects that are of relevance for the environmental sector although not focused on this sector alone. One example is the "One Map Myanmar" project supported by Swiss Agency for Development Cooperation, which aims to collect and organise all spatial data used by different government departments and development organisations by 2020[12].

Capacity building is a key topic for several of the projects and many are focused on particular solutions such as developing solid waste management, forest law enforcement, developing environmental safeguards or EIA guidelines. These will over time build up competence, but one should also consider the needs related to strengthening the basic capacity of the environmental conservation in Myanmar. Some of the fundamental elements of effective environmental policy are currently missing. These include an accessible database and registry of all activities that are subject to EIA and licensing.

12 Myanmar Business Today, August 20-26, 2015, p. 6.

Figure 6: The distribution of development partner projects across categories

PART II
ROADMAP FOR IMPROVING THE IMPLEMENTATION OF ENVIRONMENTAL POLICIES IN MYANMAR AND TO GUIDE THE SUPPORT OF DEVELOPMENT PARTNERS

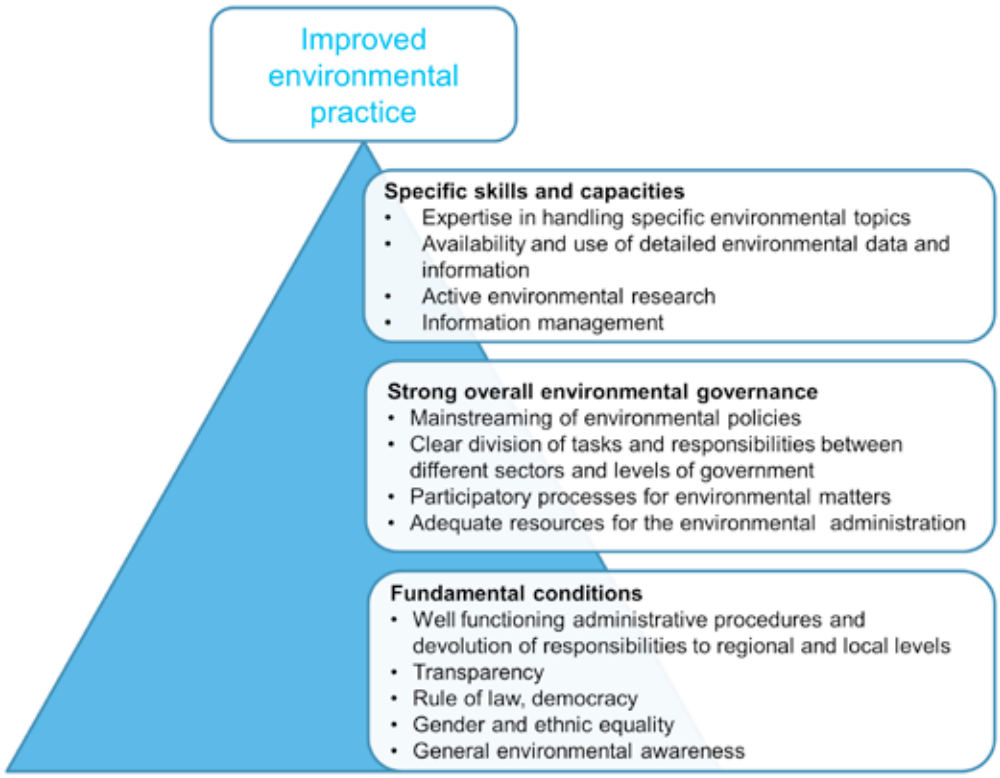
1. TOWARDS IMPROVED ENVIRONMENTAL POLICIES AND PRACTICE

An overall finding of this study is that Myanmar has a well-developed set of environmental strategies and objectives. Bold and strong visions for the state of the environment and sustainable development have been enshrined in environmental policies and development strategies. These visions and objectives have also been reaffirmed in official speeches and statements. The translation of these visions to operative action is challenging, not the least due to, for example, a great number of unfilled positions in the ECD and lack of resources for environmental governance.

This study has largely confirmed previously identified gaps and development needs in Myanmar's environmental practices. Based on earlier observations and the new findings made during this study, a roadmap towards significantly improved implementation and enforcement of environmental policies and practice can be outlined (Figure 7).

At this stage, a roadmap cannot be very detailed. Progress in environmental policies and practice is conditional on the progress of Myanmar's administrative reform, as well as the democratization and peace process more broadly. es. The level of environmental awareness of the people and capacities of the administration are fundamental for the progress. The rapid increase of personnel under the ECD and MOECAF underlines the importance of well-functioning internal administrative processes, including management of human resources,

Figure 7: The different levels in striving towards improved environmental practice in Myanmar.



on-the-job training, planning, budgeting, financial monitoring and document handling. There are also many different pathways that can contribute to significant improvement of the environmental practices in Myanmar. Priorities are ultimately political choices.

The strength of the environmental governance rests on the integration of environmental perspectives in all important sector policies (mainstreaming or policy integration). Many environmentally important activities fall under the responsibility of other line ministries than the MOECAF. Therefore good cooperation between ministries and the inclusion of environmental aspects in all sector policies, in particular in those related to, for example, the development of forestry, agriculture, mining, energy (including oil and gas), industrial activities, tourism and land use, is crucial. Common or shared tools for information management are likely to enhance co-operation and coherence between ministries and policy areas. This requires adequate resources also for the environmental administration.

Coherent legal base is important. The ECL provides a general framework, but in practice it interacts with numerous other pieces of legislation. Improving the implementation of the ECL therefore requires a comprehensive approach which also pays attention to the coherence between the ECL and other legislation.

2. OBJECTIVES OF THE ROADMAP

The main aim of the roadmap is to identify key actions for enhancing the implementation of environmental policies in Myanmar. The starting point is the ECL, but the recommendations also aim at strengthening the overall context in which the ECL is being implemented.

Some of the recommended actions should be initiated as soon as possible as they will form the base upon which other activities will be built. These have been identified in the text. They address current **fundamental gaps for effective implementation of existing environmental policies**. Other activities are long-term in nature. They should be initiated with feasibility studies or research projects that help to specify detailed priorities and future actions.

The roadmap does not include detailed cost estimates or timelines as these will depend on the level of ambition and progress in general administrative capacity and practice. The roadmap provides **indications of the magnitude and duration of the tasks**. The project to formulate a National Environmental Policy, Strategy Framework and Action Plan for 2016 to 2030 that is supported by UNDP Myanmar that is initiated in October 2015, will provide opportunities to specify further details of the actions.

In developing Myanmar's environmental policies and practice, the role of the ESWG is important. The ESWG **has the potential to ensure coordination and enhance learning** that helps both the administration and development partners to focus and adjust activities for increased effectiveness. Development partners support a large number of projects (Figure 6) which puts Myanmar's authorities under heavy pressure to manage them in addition to dealing with the tasks specified by existing legislation. **Coherence among the DP projects is therefore essential**.

The logic of the roadmap is as follows. First, general cross cutting actions are identified. They represent **fundamental conditions for progress**. Second, thematic actions are identified based on the priority areas that have been identified for Myanmar's environmental governance by the MOECAF and ECD, previous studies, and the interviews and workshops organised for this study. These relate in particular to the effective implementation of the ECL and the mandate of the ECD. For each topic, a brief statement is included on the objective of the thematic area, followed by a synthesis of the types of actions that are required. Actions are listed, when possible in an approximate order of priority and with indications of the type of projects that can be envisioned.

Participants of the workshop on discussion for needs assessment for effective implementation of Environmental Conservation Law, jointly organized by Ministry for Environmental Conservation and Forestry, Ministry of Foreign Affairs of Finland and United Nations Development Programme. *Environmental Conservation Department*

3. CROSS-CUTTING ACTIONS

Five cross-cutting actions have been identified. They develop the **general capacity to address environmental challenges** and are thereby important also for the specific thematic actions in Section 4. The cross-cutting actions include **both urgent and immediate actions and longer-term commitments** and efforts. The costs range from small-scale projects to longer-term major commitments.

1. Mainstreaming and integration of environmental considerations in relevant policy areas.
2. Clarification of responsibilities between authorities both horizontally and vertically.
3. Ensuring the economic base for the environmental governance and ensuring economic sustainability of administrative tasks
4. Strengthening participation, and access to environmental justice and information
5. Strengthening existing and establishing new environmental services.

1. Mainstreaming and integration on environmental consideration in relevant policy areas should be championed by MOECAF.

The practice of the NECC needs to be developed as its activities and role are still elusive. Small scale projects that develop the functioning of the NECC, using, for example, standard process development tools would clarify its role. Process development is also needed to clarify environmental decision making in MIC, so that it can rely on the ECD and ECL for environmental considerations once necessary regulations and administrative practices are in place instead of developing its own environmental assessment routines.

To provide a base for mainstreaming the Government of Myanmar should decide that specific **environmental awareness activities and capacity building are to be carried out in all line ministries**. Specific environmental strategies and guidelines for important sectors such as forestry, mining, hydropower, oil and gas, agriculture and tourism should be developed. Systematic studies should be carried out on the needs for a revision of the legal base to ensure that environmental concerns and sustainable development are considered in relevant sector legislations.

Mainstreaming activities should be **rapidly initiated** and can be carried out with support from DPs in the form of, for example, process expertise. The activities should **lead to autonomous and continuous improvement**. They require commitment from the involved organisations, and should also aim at clarifying responsibilities and ensuring smooth flow of information. In the long term these activities identify the need for legislative reforms, but a revision of, for example the ECL is not advisable before experience has been gained on the operation of the NECC as an instrument of mainstreaming.

2. The clarification of responsibilities and links between authorities at the central and regional/state/local levels in dealing with environmental matters is essential.

The study has shown that in many sectors it is unclear which authorities are involved and what mandates they have. This problem was stressed especially in the workshops (Appendix 2).

Practice should be clarified by **developing transparent descriptions of key processes including environmentally significant licensing and EIA**. Process descriptions should describe the division of labour and roles of different authorities. The ECL and the ER provide flexibility in, for example, how consultations for EIAs are conducted. The Environmental Conservation and Supervision Committees at the state/region level can provide a platform for process development. In other areas, such as in ensuring that environmental authorities have a say in developing mining, adjustment of relevant legislation may be necessary.

Further **clarification is needed of the role and duties of township and ward/village tract development support committees** vis-à-vis environmental and natural resource management. Operating guidelines or terms of reference for the

committees should be developed. The roles can be clarified and documented in small DP projects devoted to the role of a specific authority, but at the same time it is essential to ensure overall coherence of the system. Sharing of lessons learnt from such first activities in this area is essential. Small-scale projects where the beneficiary is a specific local authority whose working conditions and practices are improved are not a sufficient response to the needs of the environmental administration in Myanmar. They may, however, when adequately designed, help to identify how the administration and its practices could be reformed.

3. The financial base of the environmental administration has to be ensured.

This can be achieved through a **combination of basic budget and collection of fees** from polluters and users of environmental services. The design of cost efficient models that provide incentives for developers, users and authorities to innovate and develop respective practices is a challenging task.

The task is urgent as the material gathered for this study through interviews and workshops unambiguously demonstrated that **environmental governance in Myanmar currently suffers from lack of capacity at all levels**. There is a lack of human resources for effectively implementing existing tasks that follow directly from the ECL and there is a lack of financial resources to implement development work to create, for example, ICT-solutions that would increase the efficiency of the administration.

The capacity deficits of the environmental administration cannot be sustainably solved through DP funding, but require **models for sustainable financing of environmental governance**. The design of financing models is suitable for small scale sector specific projects. They should provide practical solutions for how to ensure adequate resources for, for example, the management of EIAs, environmental licensing, waste management and water supply.

The establishment of **operating rules for the Environmental Fund is an area of high priority**. There are expectations on the fund but also uncertainties over how it will operate in practice. Dispelling the concerns and achieving equitable and legitimate solutions for the environmental fund is important and different options need to be explored. DPs experiences of similar instruments should be fully exploited in designing the rules and operating rules for the fund.

4. Setting up and ensuring the functioning of participatory and community driven processes and access to environmental justice is central for the improvement of Myanmar's environmental governance.

It would increase the relevance, legitimacy and effectiveness of environmental policies. One aspect of environmental justice is the equal treatment of environmental permit applicants. The use of sanctions must be balanced with administrative enforcement instruments.

The current legal base for participatory processes is weak and does not allow for systematic participation of stakeholders. A **review of current regulation determining the extent of and opportunities for public participation** should be carried out to provide the base for legal development.

A strengthening of the legal possibilities of CSOs to act strengthens the role of civil society **in environmental matters**. A long term task is therefore to reform the **legal framework for civil society organizations and the private sector with respect to access to environmental information**. This should be supported technological solutions such as digital libraries, open databases and e-participation platforms.

Participatory processes should be supported through guidelines and pilot work. Some DP projects have been implemented with this focus, but there is clearly room for more coordinated efforts. Public consultations related to the EIA process should be supported and used as testing grounds for guidelines. Specifically directed support for participation can be provided by development partners in relatively small scale projects, but **the experiences should be shared in order to achieve wider learning**.

Country-wide participatory processes have been initiated in, for example, in national land policy

development and support for collecting and systematizing experiences gained would be justified. The experiences gained in drafting the National Land Use Policy could be collected in a special evaluation for further development, improvement and institutionalization (incl. codification) of public participation mechanisms in policy formulation.

A priority should be to improve access to information and awareness of environmental policies, laws and related procedural rights as well as of who the duty-bearers (responsible authorities) are at the local level. Established communication channels should be used as well as new media and awareness-raising materials (such as posters and leaflets) in local languages. Opportunities for two-way flow of information and contributions by citizens and organizations to environmental monitoring should be harnessed. These can be developed in small projects, but care should be taken to ensure coherence across projects and processes for transferring project experiences gained.

At the level of practical information sharing, the Myanmar Environmental Information Portal (MEIP) that development partners have supported, is an excellent starting point, but it needs to be developed considerably with respect to contents and updating (See point 4.7 below) before it can fulfil its objectives. The development and updating of the portal will require relatively large scale projects focusing on both the technical and administrative side of the portal. Ensuring resources for its long term maintenance is also essential.

Providing **better access to environmental justice** should be of high priority. Models for structures and processes exist within the UNECE (the Aarhus Convention), the EU and individual member states of the EU. It is therefore a topic where the base and legal options can be suitably explored in projects supported by DPs. At the same time, developing environmental justice is a deeply political activity that will require full commitment of MOECAF and the administration more broadly. It is a long-term undertaking, but because of its importance it should be initiated as soon as possible. It has direct implications for the management of grievances and complaints that currently requires significant effort in many regional offices of the ECD. By streamlining and making processes coherent the rule of law can be strengthened. **As a first step, guidance should be prepared for developers as well as local and regional authorities** in priority sectors through focused small-scale projects.

5. Strengthening of existing and establishment of new services in the environmental administration

Knowledge based services include **applied research, consultancy services, laboratory facilities for environmental analyses and testing of products as well as monitoring networks. Their development is a long-term tasks**. They can be rapidly initiated on a small scale, but require long-term commitment in order to become significant. There is also a need for infra-structure like environmental services such as facilities for waste and waste water treatment. They are urgently needed and require significant investments.

The current **lack of baseline data and other environmental information** is partly the result of low level of environmental research. Some universities and CSOs engage in such activities, but in general, the current capacity is small for a country as diverse and large as Myanmar.

The first step should be to **activate local universities and other research facilities to contribute to environmental research that supports the implementation of the ECL**. This would include, for example, research on the state of the environment, evaluations of the effectiveness of standards and other specific measures and development of innovative measures to address acute problems in environmental management and pollution control.

Environmental capacities could be strengthened through the **establishment of new research facilities such as a new research institute** comparable to, for example, the forest research institute. The research should cover both natural and social sciences. Such a research institute would be a natural recipient of new research infrastructure. The development of new strong research facilities is, however, a long-term endeavour that will require substantial commitment and coordinated action also from development partners. In the long-term an environmental research institute can become

partly self-financing through international and national competitive research funding, but part of the activities such as monitoring should be based on a core budget.

4. THEMATIC ACTION AREAS

The thematic actions build on the cross-cutting actions and represent areas that the project has identified as key areas for the ECD and its role in implementing the ECL, based on numerous interviews, workshop discussions and reviewed documents. They reflect the environmental policies that provide the framework for all activities. EIA, licensing, pollution control and management of hazardous substances are central in the control of point source pollution. The management of urban environmental issues are gaining importance with urbanisation, whereas the sustainable management of natural resources is essential in ensuring sustainable development in Myanmar. Finally, raising environmental awareness is an important objective of the ECL and also a fundamental for its effective implementation. The following sections elaborate the possible actions to make progress in each of these areas.

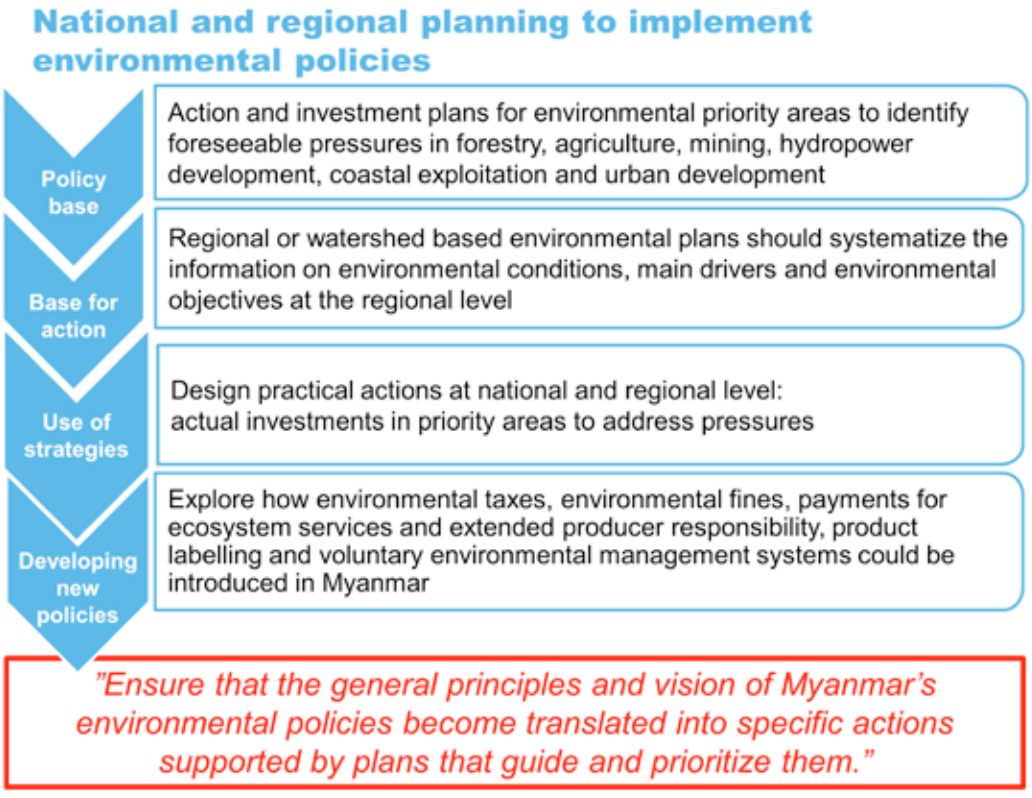
4.1 National and regional planning to implement environmental policies

Objective: To ensure that the principles and vision of Myanmar's environmental policies are translated into specific actions supported by plans that guide and prioritize them.

There is a particular need for progress in terms of concrete action and investment plans, watershed-based planning, but also for long-term visionary development of the use of economic instruments (Figure 8).

1. Action and investment plans for environmental priority areas should be drafted to **identify foreseeable pressures in, for example, forestry, agriculture, mining, hydropower development, coastal exploitation and urban development**. These plans should identify the necessary steps to meet key environmental challenges include action points for authori-

Figure 8: Key steps in progressing towards better implementation of policies



ties at different levels, specify the investments that are needed to achieve environmental targets and consider options for financing the investments and maintenance. These actions plans can be supported by sector specific DP projects that aim at identifying priorities and potential financing mechanisms for the necessary investments.

2. Regional or watershed-based comprehensive environmental plans should be drafted to **systematize the information on environmental conditions, main drivers and environmental objectives at a regional level**. Such plans would provide baseline and reference values for major development projects at a regional level. The preparation of such plans can be carried out in dedicated projects, some of which are already ongoing or in preparation.
3. A long-term task in policy development is to **explore how approaches such as environmental taxes, environmental fines, payment for ecosystem services and extended producer responsibility, product labelling and voluntary environmental management systems could be introduced** and applied in the national context of Myanmar and its specific sectors. These approaches could help Myanmar reach its ambitious objectives in its developments strategy, but they will need to be explored and tested before being introduced on a nationwide scale. Development partners can contribute to this long-term effort by providing support for studies and pilot scale applications.

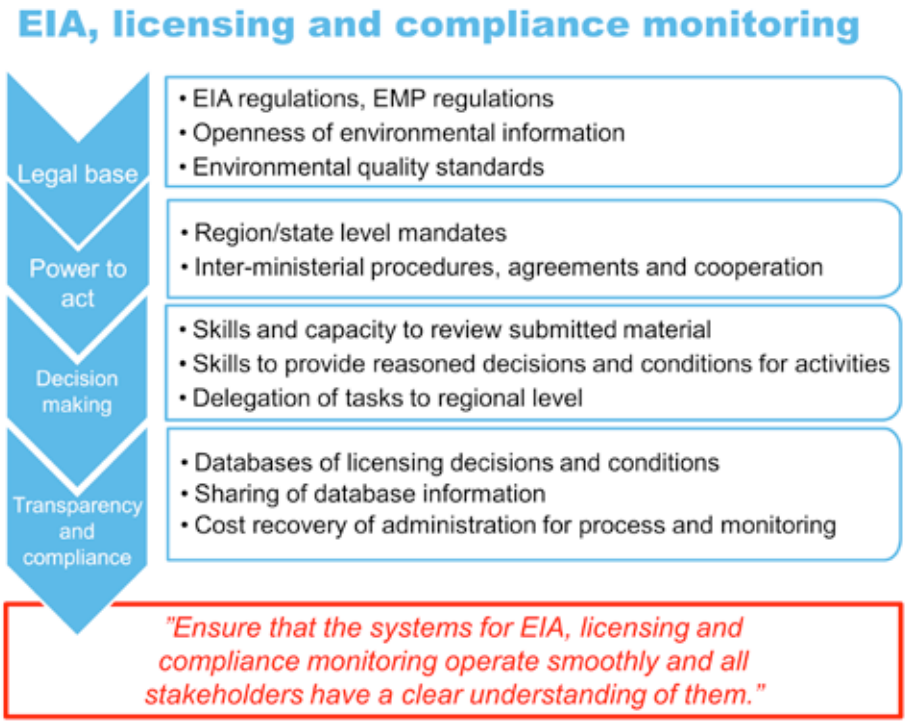
4.2 EIA, licensing and compliance monitoring

Objective: To ensure that the systems for EIA, licensing and compliance monitoring operate smoothly and that all stakeholders have a clear understanding of the processes and possibilities to participate in a fair and equitable manner.

The legitimacy and acceptance of the systems for EIA, licensing, pollution control and compliance monitoring will depend on how well they are carried out. Therefore the highest priority should be given to actions that ensure their effective implementation. The roadmap (Figure 9) suggests the following steps:

1. The most urgent task is to **complete the currently unfinished development of the**

Figure 9: Key steps in improving EIA, licensing and compliance monitoring

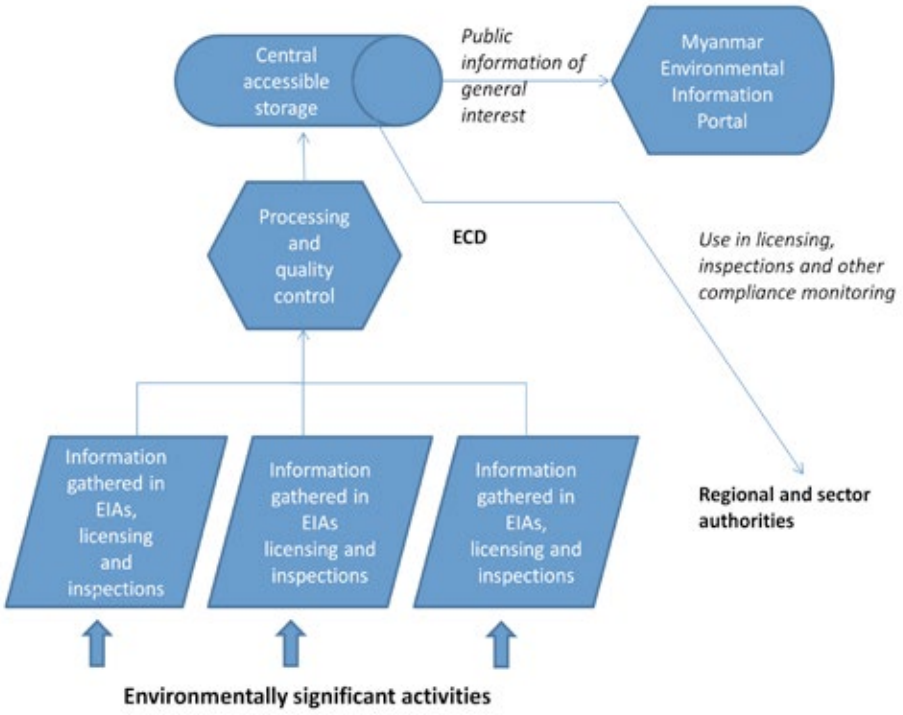


legal base, including detailed regulations and standards, licensing procedures, EIA and environmental permitting regulations and environmental standards. This task is currently largely administrative and political and thus opportunities for active DP support are somewhat limited, although there are ongoing projects that may help in finalising the legal base. In a longer time perspective, evaluations of the legislation and its implementation can provide valuable feedback for further improvement of the legal base.

2. The **further development and use of ICT-tools for EIA, including GIS, licensing and compliance monitoring should be initiated** as soon as possible. Some activities are already going on, but it would be essential to develop specific tools that could serve the handling of environmental matters by authorities (Figure 10). Currently **environmental authorities do not have adequate tools for EIA, licensing compliance monitoring** such as databases over ongoing and approved IEEs, EIAs, EMPs and filed and approved permit applications, databases on permit holders and inspections carried out. There are ongoing projects on GIS development, but they represent fragmented efforts to develop ICT-solutions supporting compliance monitoring using modern tools such as GIS. A master plan should be developed for the **ICT-solutions that will provide adequate tools to local, regional and central authorities** for dealing with EIAs, permits, inspections and other compliance monitoring. Effective coordination between MOECAF and other authorities dealing with likely users such as the MIC, the Ministry of Industry and Ministry of Mines should be ensured. This action will require **significant investments in terms of planning, programming, deployment and training**.[13]
3. **On-the-job support for the tasks of reviewing of EIAs, IIEs, EMPs and the writing of permit conditions will be necessary** for coping with the growing demand. The task of handling EIA reviews and licensing with ECC conditions will expand rapidly. **Sector Guidelines for the most important industries** should be written to support effective and coherent implementation of EIA. Oil and gas, mining, dam and hydropower, industry and industrial zones, special economic zones and infrastructure have been identified as priority sectors needing EIA guidelines. All of these can be rapidly initiated at modest costs in small projects, but care should be taken that the different activities are synchronized and well-coordinated. The ESWG has an important role to play in the coordination of these activities.
4. **Rapid EIA capacity building is needed** especially within ECD and regional/state administration but also other authorities and within industries and consultants. A continuous learning process for developing EIA practice is crucial. DPs can support this capacity building by supporting the organization of joint seminars and conferences that involve different actors in order to develop common understanding and coherent implementation of the EIA-process.
5. **The development of SIA should be undertaken** in coordination with the responsible authorities to ensure that social aspects are adequately covered in EIAs. The SIA **should address land tenure and local livelihoods for the determination of appropriate and fair mitigation mechanisms of potential livelihood losses**. Gender issues should be explicitly recognised. In rural Myanmar, rife with overlapping customary and statutory claims to resources, it is particularly important to follow procedures that are as inclusive as possible to avoid adverse impacts on the already most vulnerable segments of the population. The **development of approaches and guidelines for SIA** that fit the context in Myanmar is a suitable topic for moderate scale DP projects. Major challenges are related to the ethnic tensions in the country.
6. **The polluter-pays-principle should cover administrative costs**. There is a justified concern that the ability authorities to respond in a timely way to EIAs and IEEs and permit applications will become a stumbling block that can seriously undermine the legitimacy

13 Opportunities exist for public private partnership, for example, Fuijitsu has established an ICT-lab in Myanmar http://journal.jp.fujitsu.com/en/2014/11/14/01/; as part of ADB's activity http://adb.org/projects/details?page=details&proj_id=48145-001 reference is also made to the development of ICT solutions

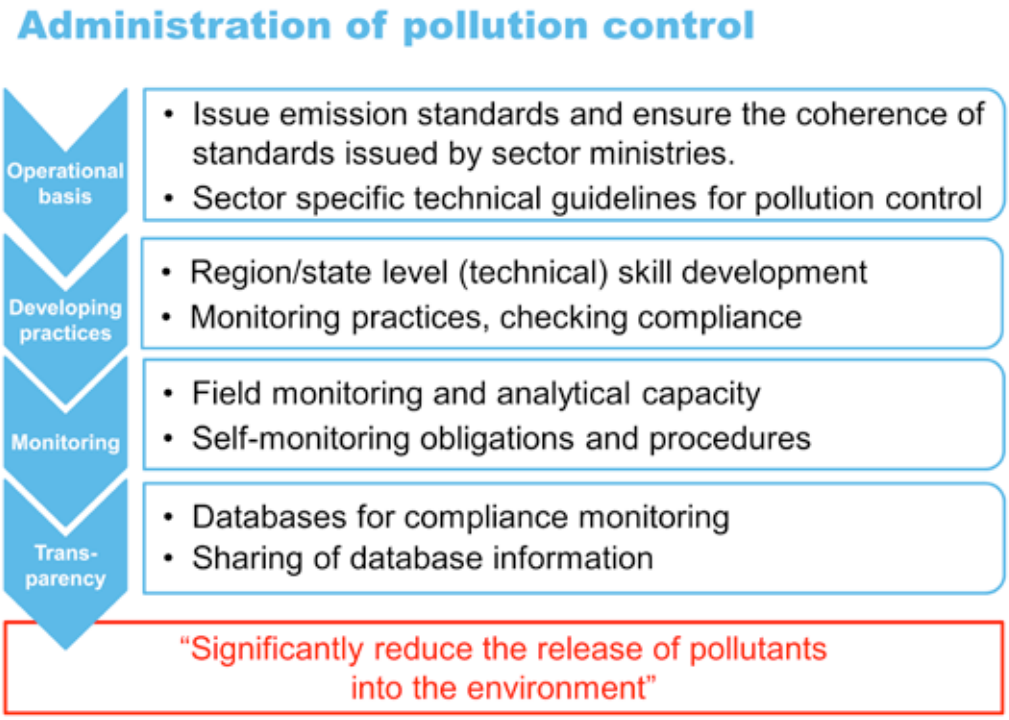
Figure 10: A conceptual sketch of an ICT-based system for handling EIA, licensing and inspections. Regional and different sector authorities would have direct access to the system and also provide input. The quality control and maintenance of the data would be with the ECD/MOECAF that would publish basic information from it at the Myanmar environmental information portal.



of the environmental policies and practice. **By collecting fees for handling the applications, resources can be obtained to recruit and educate necessary experts**. The setting up of fee collection systems is suitable for a small scale project. In Myanmar there are some collecting systems in place at the local level and the experiences from these are an essential starting point for any project on cost recovery.

7. **Licensed activities should be required to monitor their environmental impacts** (self-monitoring practices based on monitoring programmes approved by authorities as part of the EMP and verified by third parties as for certified environmental management systems such as ISO 14000). On-the-job support to Central ECD and selected Regional ECDs and Regional Environmental Committees in designing and implementing compliance monitoring plans is needed and suitable for medium sized projects. On-the-job training for Regional ECDs on water and air quality sampling and monitoring, including interpretation of results and dissemination of findings is also advised.
8. **The mandate to process IEEs and EMPs of small and medium size activities should be delegated to the state/regional level**. The feasibility of such delegation depends on the staffing and capacity of the regional offices. With the expansion of economic activities it will become increasingly impractical to handle all environmental matters centrally. The **devolution of responsibilities and tasks is meaningful only if sufficient resources can be guaranteed** at the regional level. Development partners can contribute to this capacity building at the regional level, but MOECAF must also ensure that resources are made available for long-term development.

Figure 11: Key steps in developing pollution abatement and control



4.3 Pollution abatement and control

Objective: To significantly reduce the release of pollutants into the environment.

Actions are required to improve the analytical capacity to detect and measure pollution and the specification of standards against which pollution can be measured. There is also a great demand for on-the-job training for officials and industry (Figure 11). In addition financing mechanisms for investments in pollution control are needed. The following actions are suggested, broadly organized in order of priority except for the **investment programme, which should be initiated as a matter of high priority** as it guides important subsequent decisions that reduce emissions.

1. **Issue emission standards and ensure the coherence of standards issued by sector ministries**. Regulations related to ECCs should be formulated to include specific obligations to conduct self-monitoring and report to the monitoring authorities. The tasks are partly included in ongoing activities supported by DPs and should continue and expand to cover any gaps. The tasks can be supported further by small-scale DP projects that ensure that Myanmar's standards are in line with international standards. Consistency between DP projects is essential.
2. **Sector-specific technical guidelines for pollution control** should be prepared for Myanmar to support authorities and developers in their work in Myanmar language. There is also a need for documents in minority languages[14]. The preparation of guidelines is a continuous work that should **start with priority sectors**. As a first step, international sources such as the reference documents produced under the Industrial Emissions Directive (IED, 2010/75/EU)[15] could be used as a base for developing specific guidance for Myanmar. Workshops for authorities and developers should be organised to strengthen practice. Such workshops can be supported and organized as stand-alone events, or included as part of broader capacity building exercises. **Effective use of guidelines should be ensured through on-the-job support** to Central ECD and selected Regional ECDs and Regional Environmental Committees

14 Myanmar has several minority languages with more than a million speakers http://www.ethnologue.com/country/MM/status

15 http://eippcb.jrc.ec.europa.eu/reference/

in designing and implementing compliance monitoring plans. These are tasks that primarily need to be carried out by the MOECAF, but can be supported through small scale DP projects, including twinning activities.

3. Investments should be made in the **capacity to monitor and assess pollution levels** at regional ECD and PCCD level in the major cities. Investments should be made in equipment for monitoring typical parameters in wastewater emissions, air pollution and toxic substances in wastes. **Training should be supported in water and air quality sampling and monitoring**, including education in the interpretation of results and dissemination of findings. Some investments in analytical capacity have been made in DP projects. Further projects that build on these are likely to be highly effective. The training in monitoring should be regarded as long-term actions that can be implemented as a series of short term projects. A long-term task is to develop national environmental quality monitoring programs.
4. Tools for the administration (see roadmap on EIA, licensing and compliance control, item 2) and a **compliance monitoring database should be set up** for joint use by Central ECD and regional ECDs. In a second stage it should be linked to the environmental inspectorates of the sector ministries and PCCDs of main cities (Figure 10).
5. **Good practices for solving environmental grievances at the local level need to be ensured and developed**. This may include DP projects that would support capacity building of CSOs and CBOs to enable their active participation in conflict resolution and reporting impacts and non-compliance with environmental regulations.
6. **The skills of industry in self–monitoring practices should be raised**. This should be financed by the industry, including investments in necessary laboratory capacity. By inviting industry representatives to training for authorities mutual learning can be achieved. DP supported projects can also support the identification of available laboratory- and monitoring services through developing registration and accreditation systems that would ensure the quality of the available services.
7. In the long-term capacities of industry, consultants and institutes should be strengthened in conducting **voluntary cleaner production audits and using environmental management systems such as ISO 14000**. There is also scope for considerable progress in energy efficiency. This is primarily a task of the industry itself, but the possibilities to link environmental management systems to streamline the mandatory reporting and monitoring should be explored in developing the legislation and regulations. Support for energy efficiency work can also be highly efficient. Such policy oriented R&D work can be supported by DPs.
8. **Soft loans for central wastewater and waste treatment facilities should be provided**. The funding would be supported by an overall investment programme for environmental installations and possibly by providing tax incentives (see Planning national and regional work plans to implement environmental policies, item 4.1). A significant investment (USD 36 million) has been the Dowa waste treatment facility in the Thilawa Special Economic Zone, demonstrating the emergence of these activities on an industrial scale.

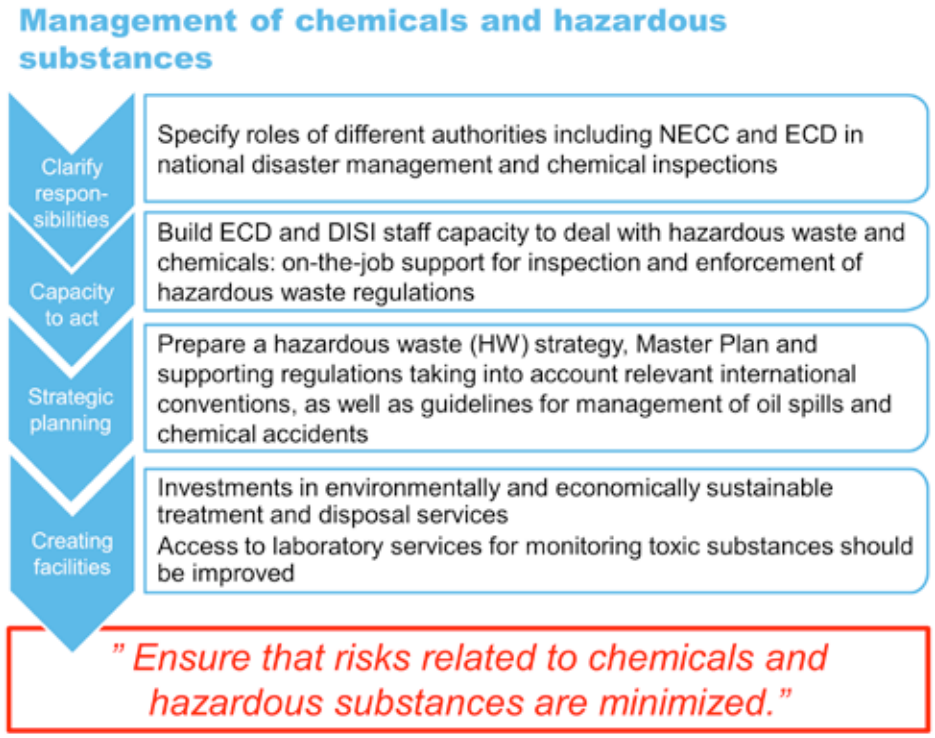
4.4 Management of chemicals and hazardous substances

Objective: To ensure that risks related to chemicals and hazardous substances are minimized.

Action is required at the level of planning, clarification of the roles of authorities, capacity building of authorities and industry, availability of laboratory services and treatment facilities (Figure 12). The following actions are suggested broadly in order of priority although the preparation for oil and chemical spills can be initiated in parallel with efforts to improve HW management.

1. **The roles of different authorities including NECC and ECD should be defined in the national disaster management plans.** ECD could have a relevant role in regulating the environmental aspects of the mitigation and response actions in oil and chemical acci-

Figure 12: Key steps in improving the management of chemicals and hazardous waste



dents, for example, in providing guidelines for the management of wastes emerging from environmental emergencies. These roles can be clarified in projects that develop the disaster risk management by bringing together relevant authorities to agree on courses of action.

2. **Build ECD and DISI staff capacity and provide on-the-job support for the inspection and enforcement of HW regulations** in industry and service businesses. At the same time regulations for identifying HW can be based on international guidelines and these should be disseminated to the industry.
3. **Prepare a hazardous waste (HW) strategy, Master Plan and HW regulations**. Hazardous waste regulations should be issued taking into consideration both the ECL and legislation on chemicals, the mandates of respective Committees and Boards and the obligations of the international chemical conventions. This should include a National HW inventory should be performed using a sector specific approach. The effort should be linked to the establishment of a national HW generator database and reporting system (see EIA, licensing and compliance monitoring, item 4.2).
4. Preparation of the Master Plan for HW management should be **followed by investments in environmentally and economically sustainable treatment and disposal services**. Access to laboratory services for monitoring toxic substances in wastes should be improved.
5. **Prepare guidelines for the management of oil and chemical spills and accidents** and the management of the HW arising from the emergency response. This task should be performed in coordination with the Central Supervisory Board of the chemical legislation.

4.5 Urban environmental management

Objective: To improve urban planning and management of the urban environment in such a way that sustainable urban solutions can be achieved.

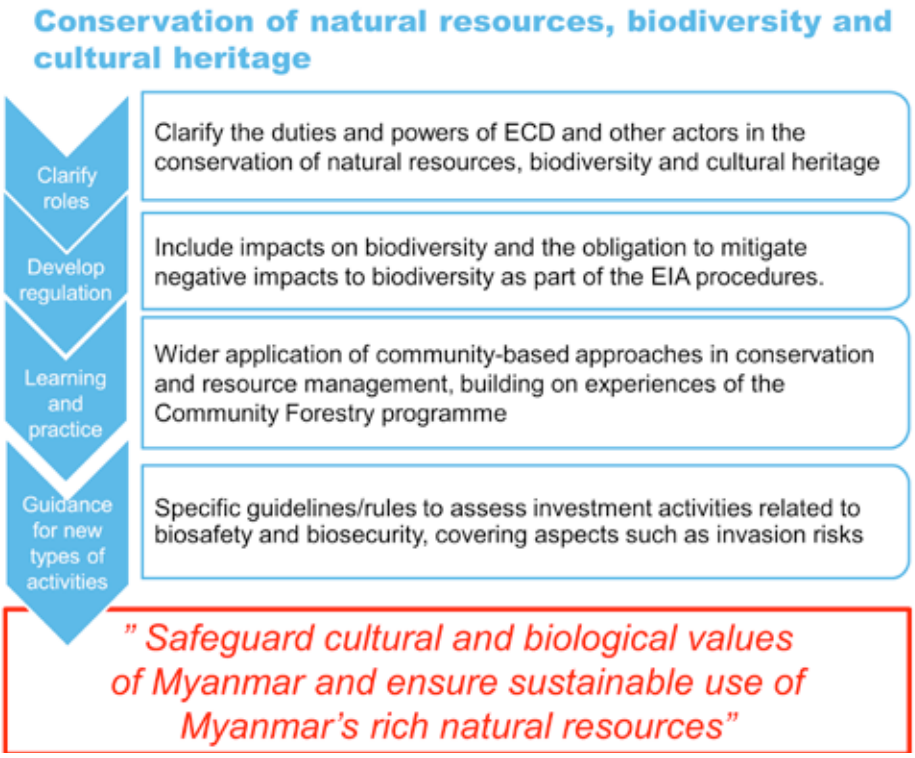
Action is required at the level of planning and development processes, in specific areas such as waste and waste water management, transportation, awareness raising, public participation and financing of activities (Figure 13). The suggested actions are very different in nature and therefore

Figure 13: Key steps in improving urban environmental management

they are not listed in order of priority but grouped according to the main type of action.

1. **Environmental concerns should be mainstreamed into urban planning regulations** and guidelines issued by relevant sector ministries. The issues include zoning of activities, traffic planning, green area planning, water safety, waste and wastewater management. Any actions and DP supported projects in this area need to include large components of awareness-raising at different levels from schools to high level policy makers.
2. The approval of the **National Waste Strategy should be followed by an action plan**. There is a need to develop waste management models for small towns and disseminate the experiences from pilot towns throughout the regions and states. Because of the high organic content of municipal waste, biogas generation and production of organic fertilizers should be considered as an option for the waste treatment. Projects that include investments will require long term commitment and significant inputs of resources. They should be in line with the investment plans for the sector.
3. **Specific actions to improve the urban state of the environment** are needed and should be included in concrete plans for urban environmental protection. These include the **management of septic tank sludge** as part of urban waste management plans, potable water safety plans, improved **operation and maintenance of the sewer network and waste water treatment facilities**, reduction of the emissions of organic load, nutrients and faecal bacteria into the environment and improvement of air quality through **reduction of emissions from transport**. The actions require investments and partly also new regulations and are therefore long term tasks also as DP supported projects. In developing these actions, feasibility studies and pilot applications are needed and these can be implemented with fairly modest resources. This work has already started in the big cities and the major regional/state level cities. More support is needed to expedite the development in smaller towns, which lack financial resources, planning capacity and technical knowhow.
4. There is a **constant need for projects where City Development Committees cooperate with local NGOs and CBOs in raising environmental awareness** (for example in

Figure 14: Steps improving conservation of natural resources, biodiversity and cultural heritage.



encouraging separation of waste at source) and in providing access to information about the state of relevant environmental indicators (e.g. water safety, air pollution). Such projects are suitable as small scale activities, but to have a wider effect they need to be replicated and scaled up.

5. Support the creation of new business and employment activities in particular **in recycling and progress towards a "circular economy"**.[16] There is no detailed information on the volume of these potential activities, but especially large urban areas offer opportunities. Cooperation between cities and the private sector and environmental and social NGOs and CBOs is important and small scale DP projects can encourage explorative experimenting.
6. The financing of urban environmental facilities is often challenging as the required investments are large. In addition to direct investment support and soft loans, **there is a need for developing systems of cost recovery in water utilities, waste management and waste water treatment**. Initially fees can be introduced to cover operating costs, but gradually full cost recovery should be achieved. The design of the fee collection system is suitable for a relatively short term DP project that should also systematically explore and analyse the merits and drawbacks of different existing solutions in Myanmar. SIAs of such systems are essential.

16 For a description of the concept, see for example http://ec.europa.eu/environment/circular-economy/index_en.htm

4.6 Conservation of natural resources, biodiversity and cultural heritage

Objective: To safeguard cultural and biological values of Myanmar and to ensure sustainable use of Myanmar's rich natural resources.

The pressure on Myanmar's natural resources is increasing and action is needed to ensure progress towards sustainable practices both with respect to renewable and non-renewable resources. An exhaustive roadmap for the sustainable use of natural resources is largely beyond the scope of this study as the ECL and the ECD play rather limited roles in the management of natural resources.

Some of the priority actions are to clarify the roles of different actors and authorities, promote community management and take biodiversity into account in planning and management (Figure 14).

1. **The duties and powers of the ECD should be clarified in the conservation of natural resources, biodiversity and cultural heritage**, in relation to the Forest Department and other MOECAF departments, as well as the other relevant sector ministries and agencies. Actions should be taken to define the mechanisms to operationalize coordination and support. These actions are to be taken by MOECAF as they provide a base also for funding and HR development.
2. **Impacts on biodiversity and the obligation to define measures to mitigate negative impacts should be made part of the EIA** procedures. Projects should be initiated to build capacity to carry out the studies that are needed. Partly this can achieved by publishing examples of good practice from actual EIA cases funded by developers, but DP supported project may also be implemented to, for example, refine methodologies.
3. **Building on available research an assessment of the social, economic and environmental performance of the Community Forestry programme should be carried out** to extract recommendations for expanding the concept to other natural resource sectors. Specific attention should be paid to the impacts on marginalized groups, such as ethnic minorities and women. The evaluation should lead to a long-term task of developing legislation to ensure community based management of natural resources in Myanmar's forests and coastal regions.
4. **Specific guidelines/rules should be developed to deal with investment activities related to biosafety and biosecurity**, including an ecological risk assessment to reduce the invasion risk of alien species in Myanmar. Such guidelines can be developed based on international good practice and the task may therefore be suitable for DP supported projects. Care should be taken to simultaneously develop the capacity to implement the rules and guidelines.

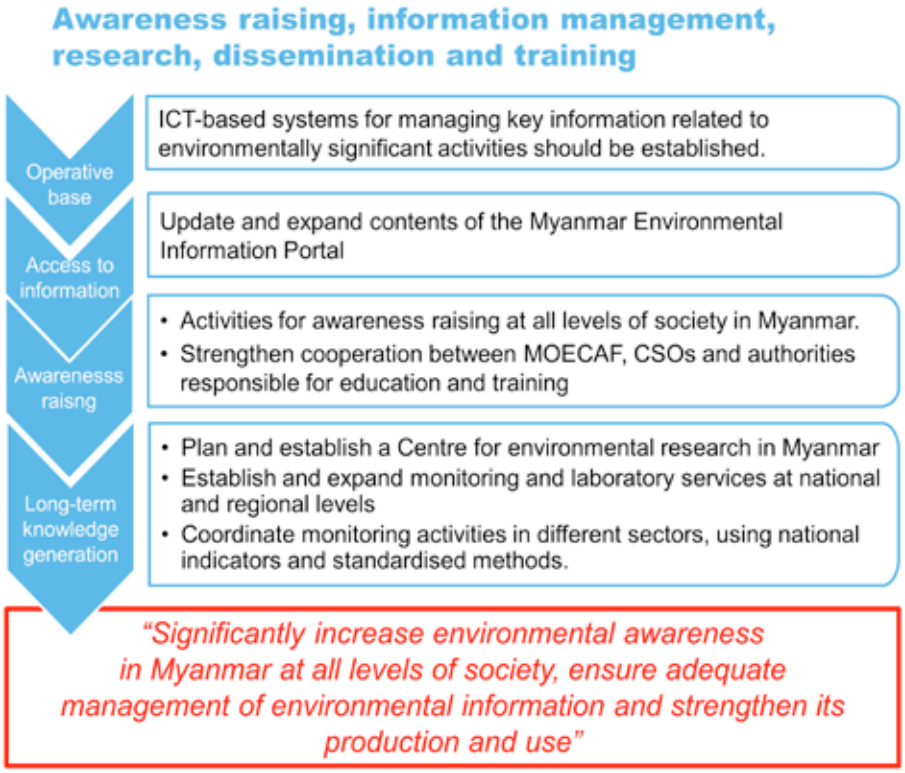
4.7 Awareness raising, information management, research, dissemination and training

Objective: Significantly increase the environmental awareness in Myanmar at all levels of society, ensure adequate management of environmental information and strengthen the production and use of environmental information in Myanmar.

Environmental awareness needs to be developed through many separate steps starting with education in schools and higher education, and reaching also decision-makers in society (Figure 15). **Access to environmental information needs to be supported by adequate management of existing and accumulating data and knowledge**. This will also create a base for the strengthening of environmental research.

1. **ICT-based systems for managing key information related to environmentally significant activities should be established**. The systems should be accessible to all authorities dealing with environmentally significant activities such as all polluting industries, power plants, mining activities, wastewater treatment facilities and waste treatment facilities. They should be established in co-operation between MOECAF, Ministry of Industry, Ministry of Mines, MIC, DICA and other authorities involved in managing and inspecting installations and can be developed through a number of interoperable systems. A starting point may be the background map data hosted now at the Survey Department of MOECAF, but which is not accessible to other Ministries or departments. This is a significant and important task of high priority that can build on existing and ongoing DP supported projects. The first step is to build an overall vision of the information management which can then be developed in a stepwise fashion. See also 4.2 EIA, licensing and compliance monitoring item 2.
2. **The Myanmar Environmental Information Portal should be updated and its contents expanded** (Figure 16). It should provide links or direct access to information on the state of the environment gathered in Myanmar, for

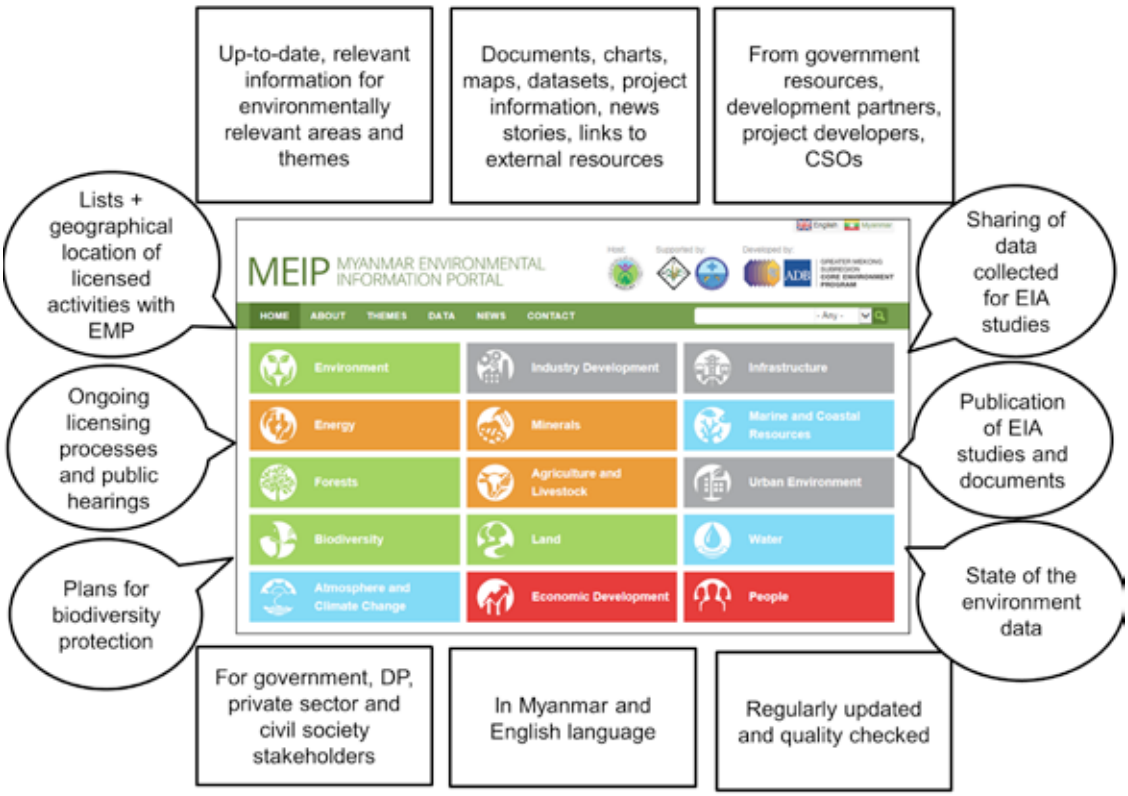
Figure 15: Important steps in strengthening awareness, improving information management and developing capacity.



example in conducting EIAs. There should also be cross linking between relevant Ministry websites and the Environmental Information Portal. It should also provide links to the ICT systems suggested in recommendation 1 in order to inform also the public about environmentally significant activities. Care should be taken that adequate funding is available for the maintenance of the portal.

3. Activities aiming at **awareness-raising should be developed for all levels of society**. Material for all levels of education should be produced in co-operation between MOECAF, CSOs, and authorities responsible for education. Institutions of higher education should be encouraged to jointly develop environmental curricula that would strengthen the base of multi- and interdisciplinary studies of environmental questions in Myanmar.
4. A long-term goal should be to **establish a centre for environmental research in Myanmar** either by creating a new institute or expanding the mandate of existing ones. Such an institute would open new possibilities for developing environmental research in Myanmar and provide support for further policy development in the environmental field. One of its tasks should also be to bring together fragmented environmental research activities in Myanmar's universities and to cooperate with related institutes internationally. In the long term part of the funding could be based on external funding that can be gained in competitive bidding.
5. **Monitoring and laboratory services at national and regional levels should be developed**. Monitoring activities between sectors should be coordinated, using national indicators and standardised methods. Priorities include monitoring of mining emissions and drinking water sources. Joint laboratory services should be identified and developed for different sectors. Laboratory capacity for monitoring typical parameters in wastewater emissions, air pollution (mainly particle emissions) and toxic substances in waste is needed. Authorized laboratories are also required by the chemical law ("Primary laboratory" and "Appellate laboratory"). Laboratory services can be complemented with field monitoring capacity at the Regional ECD and PCCD level in the major cities.

Figure 16: Suggestions for updating and further development of the Myanmar Environmental Information portal



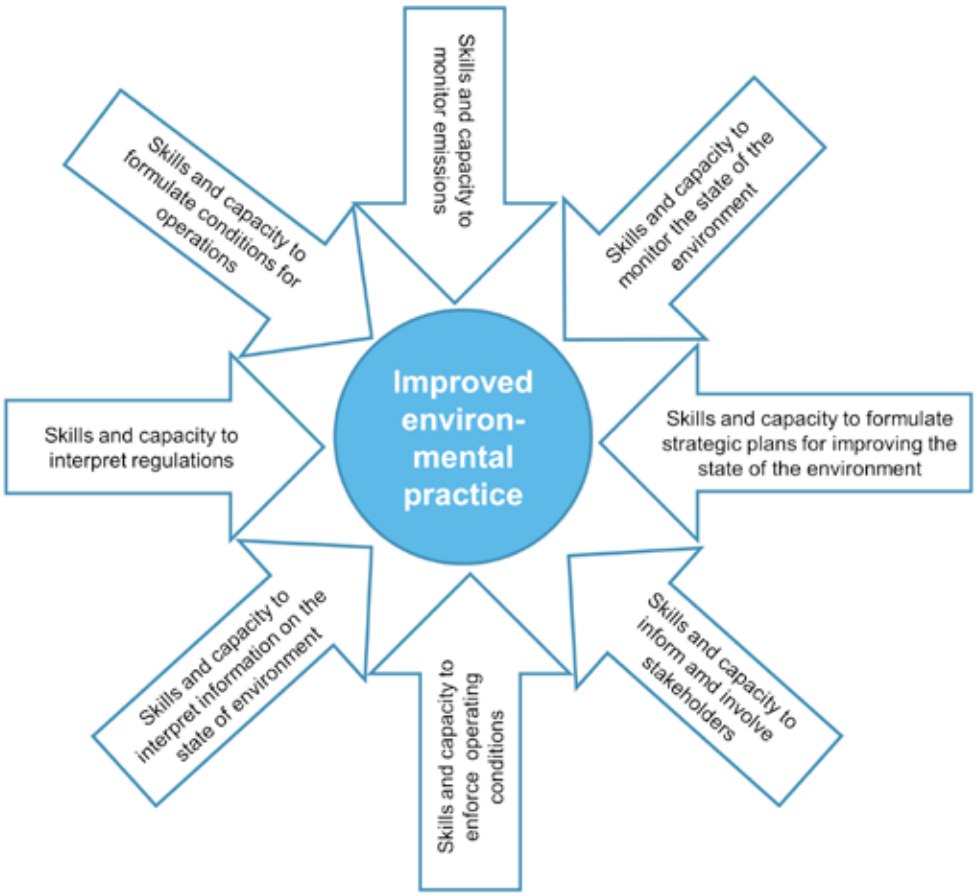
5. NEXT STEPS

The MOECAF will receive support from the UNDP for preparation of a National Environmental Policy, Strategy Framework and Action Plan for 2016 to 2030. The ECD focuses on consolidating its key activities and the roadmap is expected to serve as a guiding and supporting document for specific actions and also strengthening of long-term capacity building. Projects supported by Development Partners will help in progressing along the roadmap.

As has become apparent from the presentation of actions, there are several alternative ways of strengthening environmental governance in Myanmar. The multitude of possibilities also became clear in the final workshop of the project on 11 September 2015 in Nay Pyi Taw with approximately 30 participants and representatives from more than 10 different line Ministries as well as the City Development Committees of Yangon, Mandalay and Nay Pyi Taw. However, there is a shared view that the capacity to deal with environmental matters should be significantly strengthened. The skills and capacities take many forms (Figure 17) and therefore a diversity of actions is needed.

The roadmap provides an overview of key actions. The ESWG will play an important role in coordinating the projects supported by DPs and it is important that these projects are fully integrated with the actions that MOECAF, the ECD and the relevant line ministries take. The roadmap should be regularly revisited in the implementation and monitoring of the National Environmental Policy, Strategy Framework and Action Plan to ensure that it remains salient and helps to focus the work on strengthening environmental practice in Myanmar.

Figure 17: The many different forms of skills and capacities needed in the public administration to improve environmental practice in Myanmar



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APPENDIX 1. PARTIES CONSULTED DURING THE NEEDS ASSESSMENT PROCESS

Date	Place	Participants
27 April 2015	EU Delegation, Yangon	Delphine Brissonneau, EU delegation, Programme Manager for Environment & Natural Resources Management
27 April 2015	Embassy of Norway, Yangon	First Secretary Ms Marte Brisaid, Norwegian Embassy
28 April 2015	ECD Headquarters, NPT	Deputy Director General Mr Hla Maung Thein Pollution control - Director Ms Kyi Kyi Myint Natural resource & EIA – Deputy Director Ms Khin Thida Tin Policy, international relations, research and training – Deputy Director U Kyaw San Naing Assistant Director Mr Aung Thu Kyaw Deputy Staff Officer Mr Chan Hein Thu
29 April 2015	Pollution control division, ECD	Pollution control - Director Ms Kyi Kyi Myint Mr. Mr. Min Maung, Deputy Director Ms Thin Thin, Deputy Staff Officer Ms Khin Myo Sat Aye, Deputy Staff Officer Mr Thin Thant Shwe, Deputy Staff Officer Ms Seint, Deputy Staff Officer
29 April 2015	Natural resource and EIA division, ECD	Daw Khin Thida Tin – Deputy Director U Aung Aung Lay – Assistant Director U Htin Aung Kyaw – Staff officer U Khin Maung Zaw – Staff officer U Sa Aung Thu – Assistant Director Daw Yi Yi Cho – Staff officer U Paing Htet Oo- Deputy Staff officer Da Aye Cho Cho Zaw – Deputy Staff officer
29 April 2015	Policy, international relations, research and training, ECD	Director Than Aye Assistant Director Mr Aung Thu Kyaw Deputy Staff Officer Mr. Chan Hein Thu
29 April 2015	Forest Department, MOECAF	Director General Forestry, Director of Community Forestry, Director of Training
29 April 2015	Nature and Wildlife Conservation Division, Forest Department	Director Mr. Win Naing Thaw
30 April 2015	Ministry of Mines	Director General – U Win Htein Director – U Kyaw Thet Director – U Aye Kyaing Assistant Director – U Thein Htun
30 April	UNDP regional office, NPT	Keiko Nomura, UN-REDD program Saw Doh Wah, UNDP Myanmar Representative of UNDP regional office
30 April 2015	WWF-Myanmar	Michelle Owen, Conservation Programme Manager Hanna Helsingen, Green Economy Team Leader
30 April 2015	UN-Habitat / Myanmar Climate Change Alliance	Pasquale Capizzi, CTA, Myanmar Climate Change Alliance

Appendix 1. Parties consulted during the needs assessment process

Date	Place	Participants
30 April 2015	Skype	Stephanie Venuti, ADB environmental law consultant
3 May 2015	WCS, Yangon	Robert Tizard, technical advisor
4 May 2015	JICA, Yangon	Noriko Sakurai, Councellor Japan Embassy
8 May 2015	Regional ECD, Yangon	U Myo Lwin, Director
12 May 2015	Regional ECD, Mandalay	U Min Thein, Assistant director
13 May 2015	Mandalay City Development Council	Committee Member U TUn Kyi Head of Dept Myo Aung Road & Bridge dept Head of Dept Soe Moe Thein Parks and Play Ground Dept Assistant Director Min Aung Phyo, Waste Management Expert
14 May 2015	Ministry of Industry	Director U Thaung Oo. Planning dept. Directorate of Industrial Collaboration (DIC) Director Daw Naing Naing Linn, Energy Efficiency and Conservation Division, DIC Deputy Director Daw May Kyi Khaing, Directorate of Industrial supervision and inspection DISI Assistant Director Daw Aye Myat Myat Soe, DIC Director Dr. Aung Myint, DIC
14 May 2015	Geological Survey of Finland	Esko Korkiakoski, senior specialist GTK Tapio Lehto, senior specialist GTK
19 May 2015	UNDP HQ, Yangon	Iain Watson, ADB consultant
19 May 2015	World Bank office, Yangon	Ana Nunez Sanchez, WB
21 May 2015	UN-Habitat	Laxman Perera, Deputy Country Programme Manager
22 May 2015	Best Western Green Hill Hotel, Yangon	CSO workshop, see Appendix 2 for details of participants
22 May 2015	Norwegian Environment Agency	Morten Ingebritsen Wedege, Senior Adviser, National Park Section Silje Fagernes Johannessen, Senior Adviser, Section for Biocides and Global Chemical Conventions Kristin Eine, Senior Advisor, Section for International Affairs
25 May 2015	Best Western Green Hill Hotel, Yangon	Private sector workshop, see Appendix 2 for details of participants
27 May 2015	Yangon City Development Council	U Aung Myint Maw, Assistant Chief Engineer U Myo Myint, Divisional Head of Department U Han Win Aung, Sub. Assistant Engineer U Kyaw Kyaw, Assistant (Engineer) Supervisor Daw Myat Thiri Kyaw, Junior Engineer Daw Cho Cho Thet, Sub Assistant Supervisor Daw Kthary Maung, Work Charge

APPENDIX 2. WORKSHOP PROCEEDINGS AND PARTICIPANTS (22 AND 25 MAY 2015)

CSO workshop on Environmental Management in Myanmar 22.5.2015

Best Western Green Hill Hotel, Yangon

The workshop was initiated with all participants discussing about the environmental problems that they have faced in their CSO activities. After that the discussion was organized around the five themes using a "world café" setup that allows all participants to comment on all the questions. The participants were divided into five groups and each group moved from one theme to the next approximately every 25 minutes. Each theme was led by a facilitator who collected the views of each group and thus the workshop accumulated the comments of everyone. In the end a voting was organized in order to get an indication of priorities and the main areas of interest.

1. Topics and questions for discussion

1. **Ideas for improving the ways to deal with the environmental concerns that you have experienced**
   a. Which environmental problems are the most important for the work in your organisation?
   b. How should the way of handling environmental matters be improved?
   c. Is there a need for new specific regulations or practices?
2. **Role of access to information for the CSOs**
   a. Which environmental problems are the most important for the work in your organisation?
   b. What kind of information would be essential for your organization in environmental matters?
   c. How could access to information be improved (availability, timing, contents)?
3. **Current and future roles of CSOs in dialogues between civil society, project developers and the government, and also international donors**
   a. Which environmental problems are the most important for the work in your organisation?
   b. What roles have CSOs been able to play under the current legislation in environmental matters?
   c. What roles could CSOs play **in the future** in the implementation of environmental legislation?
4. **Needs and ways to develop mechanisms facilitating public participation in environmental matters**
   a. Which environmental problems are the most important for the work in your organisation?
   b. What changes would be needed in **practice** to give CSOs a clearer/stronger role in the dealing with environmental issues?
   c. What changes would be needed **in the environmental laws and rules** to give CSOs a clearer/stronger role in addressing environmental issues?
5. **Need to develop the activities and practices of authorities other than the national environmental ones**
   a. Which environmental problems are the most important for the work in your organisation?
   b. Which other authorities except the national environmental ones are important for the work in your organization (for example regional authorities)?
   c. What improvements in current practices of these authorities do you consider important for the work in your organization?

2. Findings and issues raised in the discussions

Important environmental problems

The discussions on Myanmar's environmental challenges identified numerous issues that need to be addressed. A root cause to many of the problems was felt to be a lack of awareness and understanding of environmental issues: air, water, health, overexploitation of both terrestrial and aquatic natural resources, loss of biodiversity including habitat loss and declining populations

There is therefore a need for environmental education for the public and for policy makers. There is also a lack of environmental data, and research, baselines are not available. The legal framework is still unclear, the CSOs do not yet see how the ECL will be implemented in practice. It was also stressed that there is a true lack of government capacities. Responsible authorities at township level are not informed nor empowered to conduct environmental management. A problem is the avoidance of conflict – although there is recognition of adverse development, there is reluctance to say any negative things about it out of fear of senior officials or other repercussions.

Specific problems that were identified included problems of intensive agriculture in the northern area of the country with, for example, corn, water melon and sugar cane. The use of herbicides and pesticides is poorly managed leading to excessive use and the destruction of soils, pollution of waters and negative health impacts. Erosion and floods are related to poor land management. Invasive species is a problem and impacts of climate change are also being observed. In Shan state forest destruction due to open access practices, lack of knowledge of forest policies, illegal wildlife trade and deforestation due to 1) conversion of forest land to other land uses, 2) wood fuel consumption, 3) overexploitation of timber. Social and environmental problems caused by mining activities, including problems in the permitting of mining, the lack of transparency and poorly implemented Earth rights.

The lack of sustainability in energy policies (including fuel for rural people) was identified as being also an important environmental issue. The problem of hydropower development in the Salween river was noted as a specific area of concern in relation to livelihoods along the river. It is not clear how the people would benefit from the development and how the adverse consequences are dealt with. Specific anxieties have arisen in relation to potential floods and the consequences of earth quakes. This is related to a broader issue of investment projects vs. land rights and the general pressures that development projects may have for ordinary people.

1) Improving the ways to deal with environmental concerns

Raising environmental awareness

The building of local capacity and efforts to raise awareness of environmental issues were seen to be important and it should be supported by more environmental education at schools at all levels. As a specific type of capacity, the workshop identified the need for more environmental layers and training in environmental legislation to defend local's interests and rights.

Implementation of environmental legislation

As a first step the implementation of existing environmental legislation and environmental policies should be strengthened. In developing legislation it was stressed that care needs to be taken that regulation and profit making activities are clearly separated at ministerial level to avoid conflicts of interest. The actual establishment and the initiation of the Environmental Fund was seen to be important.

To strengthen implementation it was suggested that more power should be devolved to the regional and local level and that economy and ecology have to be balanced at local level. New developments have to take environmental matters seriously and to ensure this CSO's should be seen as a part of monitoring system ("watchdogs").

Need for new specific regulation or practice

The workshop stressed that environmental legislation needs to be modernized to become more comprehensive. It was felt that the recent Environmental Conservation Law is mainly for MOECAF and ECD and that other ministries lack modern environmental legislation. Specific proposals to consider were a Law on sustainable development and a Law on climate change. In addition it was pointed out that there is a need for a general Administrative Law that would ensure people's rights and that the also authorities obey the laws.

2) Role of access to information for the CSOs

What information is needed?

There are a number of areas in which there is a particular need for better information. These include

- Energy use and development
- Hydropower development
- Mining
- Tourism development
- Large scale agriculture and concessions
- Forestry
- Watershed management
- Hydrocarbon – oil and gas development
- Land ownership and land use, especially related to spatial planning and land use policy (currently in legal process)

It was stressed that information to be collected must be based on correct and verified basic data, which in many cases means that verification must take place at the smallest unit such as the village level. Correct and verified data need to be made available both on the activity and on the people involved and/or affected. Systematic statistics is therefore essential. The information on technical aspects of projects and their impacts also needs to be improved.

Hydropower development was raised as one of the activities for which better information is needed. As an important case the concerns related to hydropower development in the Salween river were raised: there is need for reliable information on the consequences for the region, guarantees that the dams are safe and that the benefits reach the people in the region. There is also a need for information of disaster risks and security. In general more transparent information on hydropower development is needed.

The need for open and accountable information prior to organizing consultation with people was underlined. Sincere information on both negative and positive impacts of projects must be available. This should apply to all projects and also include information on possibilities for compensation for those negatively affected.

Dissemination of information could be achieved by better information systems that provide access to information, but also information on monitoring of impacts. It was also stressed that there is a need for good quality information in local languages that are a prerequisite for good community based EIAs. The need for the extent of translations can be determined by improving scoping missions that also help to determine the extent of the assessment (IEE vs full IEA)

Information on baseline conditions was noted to be critical. There is a need to have better baseline conditions which allows a comparison of potential impacts. The state of the environment information needs to be improved, and open access to information from government departments is essential.

Information for awareness development was identified as very important. The information should support training at all levels, in particular decision makers, and should therefore be of different kinds and use different means such as study tours and international visits.

Improving access to information

The access to information was considered so important that a **general law on access to information** was identified as essential. It would support a culture of transparency. Legislation should demand public disclosure of information and data on environmental quality concerning water and air etc. Product labels should also provide essential information.

A general condition for improved access to and

distribution of information was noted to be the stabilization of regulations, including clear and transparent guidelines for their application. It was also noted that there is a fear for information where armed groups operate and this hinders access and use of information.

With co-operation based on transparency between CSOs and government access to information could be improved. CSO can act as bot sources of essential information and as mediators in case of conflict.

A technical solution for improving the collection and dissemination of information could be a GIS based system on land use that would provide links and access all available information, including land ownership, development projects, and compensation for adverse impacts.

A step in improving access to information would be to improve the quality and contents and in particular the updating of the web-sites of Ministries. There are international models that could be used, for example Hong Kong on EIA.

Government plans and strategies on environmentally significant areas such as transport and energy should be announced in time and more openly. Information platforms should be developed for these plans and strategies, including systematic mechanisms for updating and sharing information. To achieve this government departments could appoint official spokespersons and develop their media skills and capacities. This would include education for government departments in the use of www and social media, in how to provide essential information on plans and projects and in how to communicate with CSOs.

Digital libraries on available information could also be developed, with summaries/abstracts of the available information. Improved availability of reference documents on impacts and on baseline conditions could be achieved in co-operation with CSOs. The production of regional state of the environment reports would provide access and reference to available information on the baselines and would encourage systematic collection of new information.

Systematics statistics on all environmentally important projects is an essential starting point for developing environmental information. The statistics should be developed by including specifications of the responsibilities and duties of project developers, with requirements that the information should be made public. Concerning large scale projects specific requirements were raised that contract information should be disclosed, including information on the ownerships behind the developer.

The **use of local knowledge** to strengthen the baseline information should be developed. The greatest improvement can be achieved through a combination of the skills and knowledge of technical experts, CSOs, local inhabitants and scientists. It would lead to community based EIAs that would also put pressure on companies to follow the outcomes and recommendations.

One part of the development of better information would be need assessments with and for local people. The progress in electrification was cited as specific example where such needs assessments are needed. Such information should be collected also from “quiet” people, i.e. often people in weak socio-economic position who are not used to defend their interests, in co-operation with the communities to know if and how progress has been achieved and where the greatest needs are. Specific progress could be achieved by creating conditions for networking and multi stakeholder participation. It would lead to the integration of different sources of information and thereby to more reliable overall findings and conclusions.

Government departments could initiate the improvement of information by providing lists of activities and developers so that CSOs could contact them. There should be systematic procedures for projects that require the identification of contacts. In the same vein project should be required to identify correct contacts and whom to inform of the developments through registration of people whose interests may be affected. It would be based on correct and verified information on land use that builds on verified local information. This would be a first step in building trust and in developing an attitude of open access to information as well as creating possibilities for integrating information from different sources.

Some CSOs have good experience in the use of social media, expanding the use from city regions would create new opportunities for information sharing.

A general way to improve access to information was observed to be the strengthening of research based information that would enable the analysis of complex data and information that is needed in areas such as hydropower development, development of electric grids and other major environmental issues.

Another general way to improve awareness and access to information was the training of journalists. Workshops that would cover access to information and media ethics would be steps on the way to strengthening the capabilities of media to report on essential questions concerning environmentally significant projects. The media could play an especially role in informing communities on projects and their likely impacts.

3) Current and future roles of CSOs in dialogues between civil society, project developers and the government, and also international donors

The roles that CSOs have been able to play under the current legislation in environmental matters

The CSOs have been active in several ways. the following specific roles were mentioned:

- participation in Governmental committees, for example committee for designing national energy policy
- piloting sustainable technology and offering the experiences to Government agencies for replication
- providing experts to work as consultants in Government or INGO projects
- participation in environmental awareness work;
- Regional government has invited CSOs to discuss specific issues such as deforestation due to charcoal production
- raising environmental concerns in public consultation meetings

The contribution of CSOs is not without challenges. Experiences of such challenges include the following:

- currently the Ministry of Education has been reluctant to work with CSOs, however they have been working with monastery schools
- CSOs need permission from Government office to conduct workshops with different target groups
- public participation meetings are usually held only in cities – rural communities are not usually approached by project proponents
- resettlement because of dam construction was performed without prior consultation of the community
- people are tired of consultation meetings
- registering of CSOs is often difficult – only registered CSOs have rights
- CSOs are regarded as “enemies of the Government”

In the discussion it was recognized that there are different types of CSOs. Some are expert organizations with highly skilled members, for example retired government officers acting close to non-profit consultants. Some are ethnic based CSOs. Some have grown from community based organizations. Others are humanitarian or rights based organizations with social work as their main concern and environment as a secondary concern.

Roles CSOs could play in the future in the implementation of environmental legislation

CSO have a significant and growing capacity to address environmental matters. The following roles were proposed in addition to the current ones:

- CSOs could participate in the monitoring of environmental conditions approved in the EIA process
- CSOs can convey/present the local environmental or social grievances to the authorities
- conducting of a community based environmental assessment of a particular geographical area
- some international agreements e.g. the Extractive Industry Transparency Initiative that Myanmar is aiming to implement, requires the participation of CSOs in the procedures

- an umbrella organization of CSOs would be important to increase their weight in national policy
- participation in Development Committees at Regional, Township and Village levels are opportunities for integrating environment issues
- CSOs should educate Community Based Organizations to become CSOs i.e. to become qualified to represent the local community in land rights and environmental conflicts

In the discussion the last point was considered to be one of the main challenges to CSOs.

4) Needs and ways to develop mechanisms facilitating public participation in environmental matters

Changes needed in the environmental laws and rules to give CSOs a clearer/stronger role in addressing environmental issues

One of the fundamental issues noted was that rights and responsibilities of CSOs should be more clearly defined in the law, especially in terms of access to information:

- throughout the project cycle (e.g. EIA documents are still confidential information; sometimes a report is leaked, but that may be risky for the gov't official involved)
- about policies and plans
- about the internal guidelines of ministries

The law should give CSOs and the general public the right to intervene when things go wrong, and to define mechanisms to submit grievances (access to justice). In particular before any EIA, SIA, there should be a legal requirement for free, prior and informed consent (FPIC). There is also an urgent need to establish and develop platforms for civil society-government-private sector engagement at the national as well as sub-national levels (this is an urgent action, as the role of regional and state governments is increasing). Ultimately progress in legislation supporting CSO will require a constitutional amendment.

Changes needed in practice to give CSOs a clearer/stronger role in the dealing with environmental issues

It was noted that practice and legislation are closely related; both need to happen for any e.g. legal reform to be effective. Important needs for change in practice were identified in the following areas

- Greater transparency of governance is needed throughout the society
- Clear and public guidelines should be issued regarding the various existing laws for more effective enforcement
- For consultation to be effective, need to consider the right mechanisms, it is not adequate to just consult online. Workshops are organized in Nay Pyi Taw which stops CSOs from participating since they don't have the money to travel (it was suggested that this was done on purpose)
- The information submitted by the civil society, whether through consultation or out of CSO initiative/through protest should be actually taken up in the processes and decisions, instead of organizing consultation just to please the donor but ignoring the results. In order for a change to occur there is a need for greater political will to (a) engage with the civil society, and (b) take environmental aspects seriously
- Establish rule of law – the same law for everybody. Currently there are "untouchable" people involved in investments who are considered above the law, so even if local or ECD officials want to apply environmental procedures to a project, they are powerless to do so
- A more equitable enforcement of the law would also change people's perceptions of it. Now the law is just seen as used to oppress people, whereas it should be protecting them
- Increasing the legitimacy of public consultation would also improve the position of the CSOs. Currently getting involved in e.g. committees may (a) be risky; what you say in a consultation can later be used against you; (b) lead to lost credibility among other CSOs/the public, if you are seen as working too closely with the government; (c) just frustrating, because what you say is ignored anyway.
- CSOs should aim at empowering local commu-

nities and leaders so that they could ultimately represent themselves
- CSOs should form networks to pool resources and influence, as many of them are very local and too small to access any grants from donors

5) Needs to develop the activities and practices of authorities other than the national environmental ones

Other important organizations for the work of CSOs

For the CSOs, key actors with environmental influence are other ministries and authorities, including:

- Myanmar Investment Commission
- Ministry of mines
- Ministry of electricity and power
- Ministry of agriculture
- Ministry of transport
- Ministry of rural development
- Ministry of construction (Urban planning)
- Region/State governments/leaders

But also,

- Village chiefs (have to give acceptance to all projects!)
- Armed (ethnic) groups
- Military

Proposals for improvement

The discussion focused on developing the practice. Among the first identified was the need to publish and start to implement EIA procedures and guidelines. Another high priority area would be to find ways to improve the cooperation between different ministries (Work of different committees was not regarded effective at all!).

The need to improve the introduction ("marketing") of projects to regional/local stakeholders in case the decision of the project has been taken at central level (e.g. benefit sharing) was seen to be important. As a specific case it was noted that there is a need to improve the understanding of big plantation project impacts (e.g. due to loss of natural habitats tigers have less wildlife to hunt and cause more damage to cattle at Shan). In general the transparency in big project planning and implementation should be significantly improved to create more trust between communities and projects.

Summary of ideas for progress based on the workshop discussions

In the concluding discussion the findings of all working group discussion were presented after which each participant was given a maximum of five votes to distribute on the proposals. The proposals and the votes given (in parentheses) are presented below.

Group 1 Strengthening environmental legislation [total 35]

Building capacity and raising awareness of environmental problems (4)

Environmental fund to be established (7)

Separate regulation and profit making at ministerial level (4)

Develop administrative law (2)

Modernize environmental legislation (1)

- Consider developing law on sustainable development (8)
- Consider law on climate change (1)

[General note: ECL perceived to be for MOECAF, not for all ministries]

More power to local and regional level in environmental issues (3)

Need for more environmental lawyers and training in environmental legislation to defend locals' interests (1).

More environmental education in schools at all levels (2)

See CSOs as part of a compliance monitoring system "watchdogs" (2)

Balancing economy and ecology at a local level

Group 2 Information development [total 35]

Raise environmental awareness at all levels, especially decision making with workshops, study tours etc. (9)

Develop legislation for open information [compare Aarhus Convention of the ECE and the corresponding EU Directives] (9)

Develop a culture of openness in government (2)

- spokespersons
- rules of procedure
- access to information on government plans
- regular updating of available information
- www

Improve baseline information on the state of the environment and people (8)

- local reliable information collected in co-operation with communities, CSOs, improving statistics
- land use information
- increase capacity for scientific analysis
- make information publicly available

Public disclosure of the state of the local environment: air quality, water quality (2)

Public disclosure of project plans, developers, contracts, owners (3)

Provide information on EIA in time to those affected and make requirements on EIA to display both negative and positive impacts – ensuring verified and sincere information (1)

Develop CSOs as providers of information platforms and mediators through networking and multi-stakeholder participation (1)

Group 3 Role of CSOs in environmental governance [total 17]

- Include as member in official committees such as the Development Supply Committee, Regional Environment Committee (3)
- Piloting new technologies, practices à role in dissemination
- Expert works as consultant to the government or donors
- Interpretation of EIAs to people, training and support to CBOs in environmental conflicts, EIAs, SIAs and related public hearings (2)
- Curriculum development, outreach in schools, coordination with ECD/Ministry of Education
- Community based SEA (5)
- EITI requires CSOs to participate (mining) (3)
- CSOs in monitoring, compliance and conveying complaints to authorities (4)
- Networking of CSOs to strengthen influence

Group 4 Changes needed for strengthen CSOs to have a stronger role in environmental governance [total 36]

Changes in laws and rules:

- clearly defined rights to information (4)
- Rights and mechanisms to intervene, submit complaints (1)
- Obligation for government to take into account CSO statements (1)
- Structures for engagement: platforms at national, state, regional level (2)
- FPIC
- Constitutional amendment (9)

Change in practice

- Rule of law: same law for all (4)→perception of law will change
- Transparency of governance (4)
- Political will to engage with CSOs (5)
- Political will to take environment seriously (2)
- Capacity-building of decision makers to bridge gaps (1)
- Networking of CSOs to pool resources and influence (1)
- CSO to empower local communities (2)

Group 5 The need to develop the activities and practices of authorities other than the national environmental ones [total 27]

Increase capacity of authorities at all levels in environmental issues (9)

Increase diversity of participation in development projects (2)

Increase cooperation and integration between authorities (3)

Conclusions

The different proposal overlap and link up with one another. A summary across the working groups shows that developing and ensuring transparency in decisions concerning projects and plans get the highest priority. This would be supported by amendments to the Constitution and other pieces of legislation to strengthen access to information and transparency. Another highly prioritized area is the need to increase capacity of government at all levels.

Improving baseline information on both the state of the environment and social conditions was also seen as important. In the concluding discussion the importance of recognizing cumulative impacts of multiple projects was brought up.

The establishment of the environmental fund was seen as on the means that could help reach the objectives. Another of the means that could be used and strengthened are the township based development support communities that meet regularly and deal with ways to advance development at the township level. This institution appears still poorly known, but can potentially provide opportunities for engagement among stakeholders.

Group discussions during the CSO Workshop. *Thiri Aung*

List of participants

#	Name	Organization	Region
1	Mo Aung Nay Chi	Advancing Life and Regenerating Motherland (ALARM)	Yangon
2	Dr. Thiri Dae We Aung	Biodiversity And Nature Conservation Association (BANCA)	
3	Adam Moser	Earth Rights International	
4	U Win Myo Thu	Economically progressive Ecosystem Development group (EcoDev)	
5	Dr. Kyaw Nyein Aye	Envir-Kleen Techno-Associates	Yangon
6	U Sit Bo	Forest Resource Environment Development and Conservation Association (FREDA)	Yangon

#	Name	Organization	Region
7	U Kyaw Nyein	Forest Resource Environment Development and Conservation Association (FREDA)	Yangon
8	Eain Da	Green Rights Organization	S.Shan
9	Sai Ngin	Green Rights Organization	S.Shan
10	Ko April Kyu Kyu	Land In Our Hands	S.Shan
11	Kyi Phyo	Mekong Energy and Ecology Network (MEE Net)	Yangon
12	Dr. Win Maung	Myanmar environment institute	Yangon
13	U Ngwe Moe	Myanmar environment institute	Yangon
14	U Aung Ko Thet	Myanmar Environmental Rehabilitation-conservation Network (MERN)	Bogalay
15	U Tin Aye	Myanmar Forest Association	
16	U Aung Myint	Renewable Energy Association Myanmar (REAM)	Yangon
17	Daw Sane Sane	Renewable Energy Association Myanmar (REAM)	Yangon
18	U Hla Myint	Swanyee Development Foundation	Aung Lan
19	Rev Kyaw Naing Win	Wa Network Social Affairs	Shan
20	U Maung Maung Ko	Water, Research and Training Centre (WRTC)	Yangon
21	Robert Tizard	Wildlife Conservation Society (WCS)	Yangon
22	Anton Thorsen	World Wildlife Fund (WWF)	Yangon
23	UAZ	Theinni Lahu Bgitist Associate	NSS
24	Daw Nan Lat	Kwan Lone	Shan
25	U Hla Wai	Kwan Lone	Shan
26	Samara Yawnghwe	UNDP-PEI	Yangon
27	U Soe Min	Lashio	Shan
28	U Min Yar Soe	Thwe Chin Doe Myay	Rakhine
29	U Aung Aung	Thwe Chin Doe Myay	Rakhine
30	Daw Su Wai Phyoe	Gayunar Latt Myar Network	Pyay
31	U Pon Nya	Gayunar Latt Myar Network	Pyay
32	Maria Suokko	Ministry for Foreign Affairs of Finland	
33	Ah Lay Bo	Shan State Lisu Christian Associate	Narthern
34	Bo Bo	Dawei Development Associate (DDA)	Dawei
35	Daw Dai Wei Thant Zin	Myanmar Green Network	Yangon
36	Daw Pyi Pyi Thant	Mekong Energy and Ecology Network (MEE Net)	
37	Dei Dei	UKSY	Kayah
38	Daw Thiri Aung	UNDP consultant	
39	Salla Rantala	SYKE	
40	Jorma Jantunen	SYKE	
41	Mikael Hilden	SYKE	
42	U Maung Maung Than	SYKE consultant	
43	Raimo Lilja	SYKE	
44	Mikko Jokinen	SYKE	

Private sector workshop on Environmental Management in Myanmar 25.5.2015

Best Western Green Hill Hotel, Yangon

1) Experiences of the current regulatory system

Topics and questions for discussion:

1. Which regulations have you experienced to be of major importance for the environmental management of companies in Myanmar?
2. Which licensing or other procedures are of particular relevance for your activities?
3. What are the key challenges and difficulties in environmental management in Myanmar?, for example:
    a. availability of information on baselines
    b. unclear rules and regulations for licensing and/or EIA
    c. differences between regions
    d. lack of standards for emissions
    e. lack of standards for the state of the environment (ambient standards)
    f. unclear involvement of numerous different authorities
    g. lack of information on pollution prevention and control
    h. irregularities in the environmental procedures
    a. What is your experience of the role of public participation in the regulation of environmental impacts?

4. What is your experience of overlapping regulation? In particular in relation to:
    a. Inspections
    b. Monitoring and reporting
    c. Experiences of the appeal system
    b. Other, which?

Summary of outputs

1. **Regulations:**

- City level pollution regulations (Yangon, Mandalay and NPT City Development Committee laws)
- Coastal beach directives (2004) issued by Ministry of Hotels and Tourism
- Constitution (2008)
- ECL (2012)
- Foreign investment law (2012)
- Forestry laws
- International standards (WB, IFC, IUCN)
- Law on protection of wildlife and conservation of natural areas (1994)
- Mining law (1994) and regulations (1996)
- Oil and gas laws

2. **Licencing or other procedures:**

- Production sharing contracts in the oil&gas and mining sectors
- MIC permits
- Registration of EIA consultants
- Fertilizer and Agricultural law regulates the import, trade and use of agrochemicals
- Registering procedure of agrochemicals
- EIA requirements (oil&gas, construction, infrastructure)

3. **Key challenges and difficulties:**

- Unclear rules and regulations, inconsistencies between laws issued by different ministries
- Unclear processes and accountabilities
- Inefficiency of EIA review process, required 90 day timelines are not met
- Lack of environmental standards (emission and ambient) – though Ministry of Science and Technology as national standardisation body is working with ECD
- Lack of publicly available information
    - o EIA reports are not published systematically, and for those that are available online the status is often unclear
    - o Environmental baseline data is very scarce and lack of baseline data for desk studies create need for resource-intensive field studies
    - o EIAs generate a lot of data that could be shared and used by other projects, but no

structured way to share data
  - Closed data policies also within UN organisations
- Lack of available laboratory services
- Lack of environmental guidelines e.g. in infrastructure, hotel, hydropower and other energy projects
- Unclear registration procedure for agrochemicals and online guidance is not available
- Lack of coordination and information sharing between authorities
- Government agencies not familiar with environmental management, low level of technical capacity and know-how especially at sub-national level
- Weak inspection and monitoring capacity
- Roles of various committees are opaque and often they are not functional
- Power struggles between different ministries
- Smuggling of illegal chemicals and fertilizers
- Lack of acknowledgement and assessment of cumulative impacts

4. **Public participation:**
- Many consultations are done with no prior preparation and communities are not in a position to express informed opinions when they hear about projects for the first time during consultations
- Language used in consultations is too technical and local (including ethnic) languages are not sufficiently considered in communications
- Consultations are not gender sensitive (women do not express their views in general consultations, their participation is low and separate consultations are not arranged for them)
- Lots of variance in consultation processes across projects, depending on project proponent
- Community consultations are very formalistic ("companies come and go") and companies fail to engage at other than village level
- Unclear if consultations have influenced project plans in anyway, possibly in the case of one pipeline of an offshore development
- Lack of community monitoring is a big problem
- There is a need to train government officials to work with local communities
- Indigenous knowledge of local communities is valuable
- Role of religious leaders (monks, Christian priests) is often important in communities
- Platforms are needed to encourage public participation
- Important to organise consultations using appropriate channels

5. **Overlapping regulations:**
- Biggest issue in the case of large joint ventures (government, public company, private company)
  - sector regulations (may or may not have environmental provisions) take over and power/reach of ECL is unclear
  - inspectors normally refer only to sector laws
  - difficulties in enforcement of standards and conditions, who decides when a company is in breach?
- Extent and details of overlaps of ECl and sector legislations is unclear and need to be analysed in detail
- ECL is an umbrella law so lawyers need to be very skilled in application, deficiencies of ECL cause problems (including lack of complete definitions (e.g. of 'conservation')
- Until rules were notified, ECL was only seen to concern about nature and wildlife → would be better without the word 'conservation' in the name or as EPL

6. **Appeal system:**
- Very few or no experiences so far
- Some cases of public resistance to projects

2) Expectations on future environmental policies in Myanmar

Topics and questions for discussion:

1. Which environmental policy areas need to be developed most urgently in Myanmar?
2. Which specific parts of the policies should be developed in particular?, for example
   a. The legal base (revising/introducing legislation)

   b. Detailed regulation on procedures
   c. Standards (which, for example Best Available Technology guidance?)
   d. Clearer specification of the responsibilities of different authorities
3. Development of and access to information. Which kind of information should be produced and made available and how it be made available?
   a. State of the environment
   b. Information on and availability of environmental services (laboratories, facilities for hazardous waste treatment etc.)
   c. Information on relevant laws for different types of activities
   d. Information on permits, permit conditions and other decisions by authorities
   e. Information on results of public consultations
4. How should costs of environmental licensing and monitoring be covered and collected?
5. Role and actions of authorities: how could the processes be improved
   a. Criteria for a "good" (acceptable) permit decision (model decisions)
   b. Monitoring, including the role of self-monitoring

Summary of outputs:

1. **Policy areas to be developed**

- Energy policy
- Land use, urbanization
- Land use rights
- Action plans for biodiversity, ecosystem services to be operationalized for specific sectors
- Benefit sharing guidelines >> Project benefits locally
- Social impact assessment
- Product policy, product security: fertilizers and pesticides
- Coastal zone management
- Off-shore standards

2. **Implementation related improvement needs:**

- Clarify procedures and rules >> ECL – EIA – IEE – EMP
- Moving from draft
- Stabilize processes across government branches – investment commission + coordination within government
- Sector specific guidelines
- Regional environmental plans/ Regional EC-D`s priorities
- Effective penalties
- Developing environmental guidelines for construction, energy-hydropower tourism
- Monitoring and inspection
- Role of committees

3. **Improving information:**

- Registry of laws and regulations
- Registry of activities: what has been granted, what conditions apply
- Publication of EMP and public access to EMP conditions
- Publication of EIA reports and status of EIAs
- Collecting and sharing baseline information from individual EIAs
- Translation <> language policy
- Openness <> CSOs as intermediaries
- Vocabulary development
- School level awareness
- Development of consultation process and procedure
- Stabilize public consultation requirements and processes
- Role of religious leaders in community consultation processes
- Special groups and equality issues
- Involvement of industry associations
- Disclosure of actions for the environment
- Create registry of services (Laboratories, Waste management, Hazardous waste)
- Capacity development at all levels – government, agencies, consultancies
- Community: Top down – Bottom up Process

4. **Financing aspects:**

- Polluter pays > part of profits for development
- Graded scale of payment for EIA – Review
- Environmental fines
- Local compensation funds
- Self – monitoring <> EMP
- Payment for ecosystem services? To be explored?
- Transition periods – balancing development

and environment
- Develop voluntary system as a route to mandatory
- Rewards and incentives

List of participants

#	Name	Organization
1	Ms. Anastacia Howe	MPRL EEP
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3	U Saw Win	Eguard Services
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7	U Min Aung Hein	Harmony Myanmar Agro
8	Robert Htun New	Harmony Myanmar Agro
9	U Htun Naing Aung	Myanmar Industries Association
10	Mr. Joern Kristensen	Myanmar Institute for Integrated Development
11	Mr. David Abrahamson	Myanmar Institute for Integrated Development
12	U Tin Than	Myanmar Survey Research
13	U Phone Myint Htun	Myanmar Survey Research
14	Mr. Ben Robinson	SMEC
15	Mr. Paul van Strijp	SMEC
16	Mr. Michael Clarke	SMEC
17	U Kyaw Naing	
18	Ms. Virginia Alzina	
19	Khaing Thant Sin Aung	PRIME Agri
20	Aung Kyaw Soe	MCRB
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24	Thiri Aung	UNDP
25	Maria Suokko	Ministry for Foreign Affairs of Finland
26	Salla Rantala	SYKE
27	Jorma Jantunen	SYKE
28	Kirsi Mäkinen	SYKE
29	Mikael Hilden	SYKE
30	Maung Maung Than	SYKE
31	Raimo Lilja	SYKE
32	Mikko Jokinen	SYKE

APPENDIX 3. DUTIES AND POWERS OF ENVIRONMENTAL AUTHORITIES IN ECL

The National Environmental Conservation Committee (NECC) and the Ministry (MOECAF)

Duty	ECL article	ER article	Organisation	Category
Advise urban environmental management such as land use planning, zoning, construction, waste management, urban pollution	17	40	MOECAF NECC	Advise urban environmental management
Cooperate with relevant departments and organizations on conservation of Natural Resources and Cultural Heritage	18-19	47-50	MOECAF other ministries	Contribute to the sustainable use of natural resources and protection of cultural heritage
sending suitable suggestions and encouragements relating to environmental conservation to the relevant Government departments and organizations;	6d	10-11, 23 a, b	NECC	Coordination
asking necessary proposals and suggestions from the relevant Government departments and organizations for conservation and enhancement of environment;	6e	16d	NECC	Coordination, advice
Facilitating the settlement of environmental disputes	7f	19	MOECAF Regional NECC	Dispute settlement
Polluter pays and compensation systems for ecosystem services and natural resource use	7o		MOECAF	Economic instruments
Contribute to the establishment of an environmental insurance system	27		MOECAF	Economic instruments
Report an environmental emergency	9	36	NECC	Emergency preparedness
Carry out measures relating to environmental emergency; emergency response plans; carry out these plans to prevent damage	10	37	NECC MOECAF ECD	Emergency preparedness
Contribute to the sanctioning of environmental offences; administrative fines, criminal sanctions; suspending of permit.	25, 35-36, 39 a.		MOECAF sector authorities, courts	Enforcement, Sanctions
carrying out organizational education and activities relating to environmental conservation;	6a	7b, 7c 8	NECC	Environmental awareness, studies and research
suggesting to enable to amend and insert, as may be necessary, the lessons on environmental conservation contained in school lessons after coordinating with the relevant departments;	6b	7 a, c, d, e 9	NECC	Environmental education
Establish, inspection and enforcement the system of environmental permitting	21-25		MOECAF GoM	Environmental permitting system, inspection and enforcement

Duty	ECL article	ER article	Organisation	Category
laying down and carrying out the Myanmar national environmental policies and other environmental policies for conservation and enhancement of environment with the approval of the Union Government.	6g	3-4	NECC	Environmental policy planning
Establishment of EIA/SIA system	7m		MOECAF	ESIA and environmental permitting
Promoting and carrying out the establishment of facilities for the treatment of solid wastes, effluents and emissions	7i	42	MOECAF	Facilitating the establishment of pollution abatement infrastructure
accepting donations, grants, materials and technological aids from local and foreign and managing and using such money, materials and technologies as may be necessary in environmental conservation works;	6c	12 c-f	NECC	Financing of environmental conservation, receiving technical assistance
The Ministry shall establish and Environmental Management Fund for implementation of environmental conservation	8	29-31, 35	MOECAF	Financing of environmental management
Negotiating international and regional agreements, programmes	7k		MOECAF	Implementing international agreements
Implementing international and regional agreements signed by Myanmar	7l	21, 27, 28	MOECAF ECD GoM NECC	Implementing international agreements
Guidance on global environmental issues (ozone layer, biodiversity, coastal environment, climate change, desertification, natural resources)	7n		MOECAF	Implementing international agreements
implementing environmental conservation policies; proposals to adopt or amend	7a	5-6	MOECAF	Implementing policies
Planning and laying down national or regional environmental management work plans;	7b	14, 15, 16 a,b	MOECAF	Implementing policies
Laying down, carrying out and monitoring programmes for enhancement of the environment, and control of environmental pollution; e.g. monitoring of the use of agro-chemicals, discharge of pollutants, waste management, construction, mineral use.	7c, 13	17	MOECAF	Implementing policies Monitoring environmental pollution
Submission of proposals to the Committee for economic incentive mechanisms	7e	18	MOECAF NECC	Proposing economic instruments
Provide necessary technologies to relevant departments in implementing the conservation of natural resources and cultural heritage	20		MOECAF	Provide governance instruments (information tools?)
Prescribing environmental quality standards (emissions, wastes, processes, products)	7d, 10-12	38	MOECAF GoM NECC	Setting environmental norms
Specifying categories and classes of hazardous wastes and use of hazardous substances; prohibition of import, export, production, storing, transport, trade.	7g	20	MOECAF	Setting environmental norms
Prescribing categories of hazardous substances that may affect the environment	7h	41	MOECAF	Setting environmental norms

Duty	ECL article	ER article	Organisation	Category
Prescribing the terms and conditions for effluent treatment and emissions of machines, vehicles and processes	7j	43	MOECAF	Setting environmental norms
prohibiting the relevant Government departments and organizations if the environmental damages arise or situations for damage arise and, if necessary, asking policy to the Union Government;	6f	16c	NECC	Supervision of environmental impacts from Government activities

The Environmental Conservation Department (ECD)

Duty	ECL article	ER article	Organisation	Category
Scrutinize and coordinate the work of other sectors related to sustainable use of natural resources and cultural heritage	18-19	47-49		Coordination
Proposals for economic instruments	7 o	24	ECD	Economic instruments
Issuing guidance on the EIA process	7m	26g	ECD	EIA
Establishing the EIA system	7m	26h	ECD	EIA
MOECAF may assign ECD to implement the EIA system	7m	51		EIA
MOECAF may assign ECD to review the EIA report or the prior permission application	7m, 21	60, 66		EIA
Dissemination of information and awareness	6a	26c	ECD	Environmental awareness
Environmental education in schools and promoting public participation	6b	26d	ECD	Environmental education
Prepare guidance on the management of hazardous wastes	7i	46 b		Environmental guidelines
Preparing the state of environment report and publishing it	6a	26i, j	ECD	Environmental information dissemination
Coordinate with relevant sectors on the management of hazardous materials and wastes (translation unclear)	7i, 7h	44	ECD	Environmental management
Implement development of solid waste management	7i	46 c		Environmental management
Preparation of control of hazardous substances	7g	25	ECD	Environmental norms
Coordinate with relevant sectors regarding environmental standards; monitoring of compliance	38	39	ECD	Environmental norms
Prepare emission norms for industrial areas, other point sources, machines and vehicles	7j	46 a	ECD	Environmental norms
Issue environmental permits	7m	26e	ECD	Environmental permitting
MOECAF can delegate the ECD to manage the Environmental Management Fund	8	32-34	MOECAF, ECD	Financing of environmental management
Negotiate, implement and monitor national and regional environmental management plans	7b, c	23	ECD	Implementation of environmental plans
Programmes for climate change policy	7l	26b	ECD	Implementation of policies

Duty	ECL article	ER article	Organisation	Category
Compiling data, research and training	6a	26a	ECD	Information management and dissemination
Inspect hazardous waste management of relevant businesses	7i	42c, 45	ECD	Inspection
ECD approval is required for small-scale enterprises before applying license from sector authorities	22	68		Prior permission to small scale enterprises
Monitor the application of cleaner production and waste recycling	7i	46 d		Promotion of environmental management
Giving comments to relevant departments on import, export & transport of hazardous substances	7g	26f	ECD	Regulating hazardous substances
Provide comments to MOECAF for advising urban environmental management	17	40	ECD	Urban environmental management

APPENDIX 4: SUMMARY TABLES OF MAIN FINDINGS, RECOMMENDATIONS AND PROPOSED ROLES FOR RELEVANT ORGANISATIONS FOR DIFFERENT THEMATIC AREAS

Thematic area: EIA and environmental licensing

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Regulation		
Regulatory instruments need to be finalized	EIA Procedure with Administrative Instructions and Guidelines for the ECC finalized and issued. Adjusting the thresholds for EIA / IEE activities and giving a transition period long enough for existing activities to submit their EMPs to MOECAF.	ECD
Coordination of environmental/sector licensing	One window procedures for investments. EIA to be integrated in the procedures. Time demands for EIA assessment must be realistic.	MIC, ECD, sector ministries
Appeal and sanction mechanisms are not clearly defined or are weak.	Regulations should include mechanisms of appealing the conditions of the environmental license. Mechanisms for enforcement should be strengthened for dealing with non-compliance with ECCs and environmental standards. Procedures for using administrative fines should be developed.	ECD Union General Attorney's Office Regional/State Governments Support from relevant sector ministries
Practical implementation		
Technical staff for EIA assessment and licensing is under huge pressure.	On the job support for EIA review, ECC conditions. 1. Sector Guidelines for the most important industries are needed to support effective and coherent implementation of EIA. Oil and gas, mining, dam and hydropower, industry and Industrial zones, special economic zones and Infrastructure have been identified as priority sectors needing EIA guidelines. 2. Gradually delegating the state/regional ECDs the mandate to process IEEs and EMPs of small and medium size activities.	ECD sector ministries Industrial associations
Practices for Social impact assessment are vague.	Strengthening SIA requires social and socio-economic expertise both at MOECAF and at consultant companies and also strengthening the possibilities of the civil society participation in the processes.	ECD. Resettlement and compensation: M. of Resettlement etc Consultants, CSOs, CBOs
The capacity for processing EMPs and for compliance monitoring is very limited.	Enforce the obligation of licensed activities to monitor their environmental impacts (self-monitoring practices). On the job support to Central ECD and selected Regional ECDs and Regional Environmental Committees in designing and implementing compliance monitoring plans. On-the-job training for Regional ECDs on water and air quality sampling and monitoring, including interpretation of results and dissemination of findings. 3. There is a need to create a learning process for developing EIA practice. Intensive EIA capacity building is needed especially within ECD and regional/state administration but also within authorities at all levels and within industries and consultants. Joint seminars and conferences between different actors involved in EIA could raise common understanding and coherent implementation of EIA.	ECD Support from relevant sector ministries
Information management, monitoring capacity and research		

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
EIAs, IEEs and EMPs are processed manually	ECD at central and regional level should be equipped with a computerized system for tracking the processing of environmental licenses. A compliance monitoring database is needed first for joint use by Central ECD and regional ECDs and in a second stage with linkages to the environmental inspectorates of the sector ministries and PCCDs of main cities. Organize the compiling and effective use of information accumulated from EIA and compliance monitoring reports, e.g. by conducting periodical sector wide benchmarking studies.	ECD
Public Participation and rule of law		
Unsystematic public participation and lack of capacity of local stakeholders to contribute to public consultations.	Development of Guidelines for the Public Consultation requirements. Good practices for solving environmental grievances at the local level. Strengthen collaboration between authorities and CSOs/ NGOs to utilize their capacity to express public concerns and grievances. Support to CSOs for capacity building of CBOs to enable their active participation in conflict resolution and reporting impacts.	ECDs at central and region/ state level CSOs INGOs

Thematic area: Pollution control

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Regulation		
The acceptable level of emissions from different activities is not legally defined.	Issue the emission standards and ensure coherence of standards issued by sector ministries.	ECD has a lead role. Collaboration with Ministry of Industry, Ministry of Mines, Ministry of Health, Pollution Control and Cleansing Department in major cities
Clarify the obligation for self-monitoring and reporting.	Ensure that the regulations related to ECCs include specific obligations to conduct self-monitoring and report to the monitoring authorities	ECD and inspectorates in relevant sector ministries.
Practical implementation		
Pollution control plans need to be followed by an investment program	Soft loans for central wastewater treatment facilities in existing industrial and special zones	Ministry of Planning and Investment CDCs of major cities
The capacity for processing EMPs and for compliance monitoring is very limited.	Develop sector specific technical guidelines for pollution control and compliance monitoring. On the job support to Central ECD and selected Regional ECDs and Regional Environmental Committees in designing and implementing compliance monitoring plans. On-the-job training for Regional ECDs on water and air quality sampling and monitoring, including interpretation of results and dissemination of findings. Field monitoring capacity at regional ECD and PCCD level in the major cities Training for industry in self-monitoring	ECD Support from relevant sector ministries

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Lack of services in environmental monitoring	Laboratory capacity for monitoring typical parameters in wastewater emissions, air pollution and toxic substances in wastes. Capacity building of local consultants and institutes in conducting voluntary cleaner production audits.	ECD and sector ministries Ministry of Industry
Information management, monitoring capacity and research		
ECD lacks the database of polluting industry.	Compliance monitoring database first for joint use by Central ECD and regional ECDs and in a second stage with linkages to the environmental inspectorates of the sector ministries and PCCDs of main cities	
Lack of national water quality monitoring program	Develop national water quality monitoring program On the job training for regional ECDs on water sampling TA to ECD on the interpretation and dissemination of findings	ECD, Watershed Conservation division of Forest Department, M. of Agriculture and Irrigation, M. of Health, Pollution Control and Cleansing Department of major cities
Public participation and access to information		
Unsystematic public participation and lack of capacity of local stakeholders	Good practices for solving environmental grievances at the local level. Support to CSOs for capacity building of CBOs to enable their active participation in conflict resolution and reporting impacts.	

Thematic area: Management of chemicals and hazardous substances

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Regulation		
The mandate of ECD is not recognized in the existing sector legislation on hazardous substances and their life cycle. Regulations on hazardous waste management are not based on ECL.	Preparation of hazardous waste strategy, Master Plan and HW regulations. Hazardous waste regulations should be issued taking into consideration both ECL and the chemical law, the mandates of respective Committees and Boards and the obligations of the international chemical conventions. Regulations for the prevention and control of health and environmental hazards from the production, transport, storage and use and for registration of chemicals in different fields of use should be synchronized between MOI, ECD and the other relevant sector Ministries. The notifications of regulated chemicals should be revised to take into consideration the international chemical conventions.	MOI has the coordinating role in chemical management. ECD has the duty of monitoring, assessing and regulating of the environmental hazards of chemicals in different sectors.
The concept of Environmental Emergency is not defined in ECL.	The roles of different authorities including NECC and ECD should be defined in the national disaster management plans. ECD could have a relevant role in regulating the environmental aspects of the mitigation and response actions in oil and chemical accidents, for example in providing guidelines for the management of wastes emerging from environmental emergencies.	
Practical implementation		
Non-existing facilities and services for hazardous waste management	The compiling of the Master Plan for HW management should be followed by an investment phase for establishing environmentally and economically sustainable treatment and disposal services.	ECD Ministry of Industry

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Low capacity in monitoring compliance with hazardous waste regulations.	ECD and DISI staff capacity building and on-the-job support for the inspection and enforcement of HW regulations in industry and service businesses.	
The role of ECD in HW management should be linked with the preparedness for chemical accidents.	Prepare guidelines for the management of oil and chemical spills and accidents and the management of the HW arising from the emergency response. This task should be performed in coordination with the Central Supervisory Board of the chemical law.	
Information management, monitoring capacity and research		
Limited laboratory capacity	Laboratory capacity for monitoring toxic substances in wastes	ECD, MOST, sector ministries, universities, companies
Information of defining and classifying hazardous waste	Regulations for identifying HW can be based on international guidelines and should be disseminated to the industry.	ECD sector ministries industrial associations
Hazardous waste inventory is lacking	National HW inventory should be performed using a sector specific approach. The effort should be linked to the establishment of a national HW generator database and reporting system.	ECD MOI other sector ministries

Thematic area: Urban environmental management

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Regulation		
National guidelines for urban environmental management have not been revised after the issuance of ECL.	Environmental concerns should be mainstreamed into the urban planning regulations and guidelines issued by the Ministry of Transport and other relevant sector ministries. The issues include zoning of activities, traffic planning, green area planning, water safety, waste and wastewater management.	ECD with MoT, City development committees, research institutes.
Practical implementation		
Poor level of municipal waste management and recycling.	The approval of the National Waste Strategy should be followed by an action plan. A waste management model for small towns should be developed and experiences from pilot towns disseminated throughout regions and states. Due to high organic content of municipal waste, biogas generation and production of organic fertilizers should be considered a priority option. The management of septic tank sludge should be included in the urban waste management plans. Low-cost, labor intensive technology is preferred, but to limit the number of dumping places regional level waste plans are needed. Develop effective systems for collecting service fees from house owners for ensuring sustainable environmental services.	The regional NEC could play a coordinating role in the regional development of urban waste management. Cooperation with private sector recycling businesses and environmental and social NGOs and CBOs is important for maximizing resource recovery and employment opportunities.

Main findings in gap and needs analysis	Recommendations to improve the implementation and enforcement of ECL	Proposed role of relevant organizations
Almost non-existing urban wastewater treatment.	Soft loans for central wastewater treatment. Affordable technology to reduce the emission of organic load, nutrients and fecal bacteria into the environment. Soft financing of the investments and capacity building for the operation and maintenance of the sewer network and the treatment facilities are needed. This work has already started in the big cities and the major regional/state level cities. More support is needed to expedite the development in the smaller towns, which lack financial resources, planning capacity and technical knowhow. Financing and TA for centralized industrial wastewater treatment facilities in industrial zones and TA for industrial wastewater treatment.	
Public participation and access to information		
Low awareness and poor access to information of the urban population	City development committees should cooperate with local NGOs and CBOs in raising environmental awareness (e.g. separation of wastes) and provide access to information about the state of relevant environmental indicators (e.g. water safety, air pollution).	

APPENDIX 5: INTERNATIONAL ENVIRONMENTAL CONVENTIONS / PROTOCOLS / AGREEMENTS SIGNED / RATIFIED BY MYANMAR (JULY 2015)

No.	International Environmental Conventions/ Protocols/ Agreements	Date of Signature	Date of Ratification	Date of Member-ship	Cabinet Approval Date	Remarks
1.	Plant Protection Agreement for the South-East Asia and the Pacific Region, Rome, 1956		4-11-1959 (Adherence)	4-11-59		MOAI
2.	Treaty Banning Nuclear Weapons Test in the Atmosphere in Outer Space and Under Water, Moscow, 1963	14-8-1963	15-11-1963 (Ratification)			MOD, MOST
3.	Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Sea-Bed and Ocean Floor and in the Subsoil there of, London, Moscow, Washington, 1971	11-2-1971				MOD, MOST
4.	Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction, London, Moscow, Washington, 1972	10-4-1972				MOD
5.	International Convention for the Prevention of Pollution from Ships, London, 1973		(Accession)			MOT (under par. 1&2 of Article 1 of the Protocol of 1978)
6.	Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, London, 1973		4-8-1988 (Accession)			MOT; Except for Annexes III, IV and V of the Convention
7.	United Nations Convention on the Law of the Sea, Montego Bay, 1982	10-12-1982	21-5-1996 (Ratification)			MOT
8.	United Nations Framework Convention on Climate Change, New York, 1992 (UNFCCC)	11-6-1992	25-11-1994 (Ratification)		41/94 9-11-1994	MOECAF(ECD), DMH(MOT)
9.	Convention on Biological Diversity, Rio de Janeiro, 1992	11-6-1992	25-11-1994 (Ratification)		41/94 9-11-1994	MOECAF, ECD
10.	Treaty on the Non-Proliferation of Nuclear Weapons, London, Moscow, Washington, 1968		2-12-1992 (Accession)			MOD, MOST
11.	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and their Destruction, Paris, 1993	14-1-1993				MOD
12.	International Tropical Timber Agreement (ITTA), Geneva, 1994	6-7-1995	31-1-1996 (Ratification)			MOCAF/FD

No.	International Environmental Conventions/ Protocols/ Agreements	Date of Signature	Date of Ratification	Date of Member-ship	Cabinet Approval Date	Remarks
13.	Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985		24-11-1993 (Ratification)	22-2-1994	46/93	MOECAF/ECD
14.	Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987		24-11-1993 (Ratification)	22-2-1994	46/93	MOECAF/ECD
15.	London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London, 1990		24-11-1993 (Ratification)	22-2-1994	46/93	MOECAF/ECD
16.	The Convention for the Protection of the World Culture and Natural Heritage, Paris, 1972		29-4-1994 (Acceptance)		6/94 9-2-94	MOCulture
17.	ICAO ANNEX 16 Annex to the Convention on International Civil Aviation Environmental Protection Vol. 1 Aircraft Noise		(Accession)			MOT,DCA
18.	ICAO ANNEX 16 Annex to the Convention on International Civil Aviation Environmental Protection Vol. II Aircraft Engine Emission		(Accession)			MOT, DCA
19.	Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies (Outer Space Treaty), London, Moscow, Washington, 1967	22-5-1967	18-3-1970 (Ratification)			MOST, MOFA
20.	Agreement on the Networks of Aquaculture Centres in Asia and the Pacific, Bangkok, 1988		22-5-1990 (Accession)			MOLFRD, DOF
21.	South East Asia Nuclear Weapon Free Zone Treaty, Bangkok, 1995	15-12-1995	16-7-1996 (Ratification)			MOD, MOST,MOFA
22.	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and / or Desertification, Particularly in Africa, Paris, 1994 (UNCCD)		2-1-1997 (Accession)	2-4-1997	40/96 4-12-96	MOECAF/FD
23.	Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, D.C., 1973; and this convention as amended in Bonn, Germany,1979 (CITES)		13-6-1997 (Accession)	11-9-1997	17/97 30-4-1997	MOECAF, FD
24.	Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, New York, 1994		21-5-1996 (Accession)			MOT, MOFA
25.	Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, Rome, 1973		8-9-1994 Acceptance)			MOLFRD
26.	ASEAN Agreement on the Conservation of Nature and Nature Resources, Kuala Lumpur, 1985	16-10-1997				MOFA

No.	International Environmental Conventions/ Protocols/ Agreements	Date of Signature	Date of Ratification	Date of Member-ship	Cabinet Approval Date	Remarks
27.	Cartagena Protocol on Biosafety, 2000	11-5-2001			13/2001 22-3-2001	MOECAF, MOAI
28.	ASEAN Agreement on Transboundary Haze Pollution	10-6-2002	13-3-2003 (Ratification)		7/2003 27-2-2003	MOECAF
29.	International Treaty on Plant Genetic Resources for Food and Agriculture, 2001		4-12-2004 (Ratification)	29-6-2004		MOAI
30.	Kyoto Protocol to the Convention on Climate Change, Kyoto, 1997		13-8-2003 (Accession)		26/2003 16-7-2003	MOECAF/ECD
31.	Declaration on ASEAN Heritage Parks	Dec 2003				MOECAF/FD
32.	Stockholm Convention on Persistent Organic Pollutants (POPs), 2001		18-4-2004 (Accession)	18-7-2004	14/2004 1-4-2004	MOECAF/ECD
33.	Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 as amended in 1982 and 1987		8-11-2004 (Accession)	17-3-2005	(31 / 2004) 12-8-2004	MOECAF/FD
34.	Establishment of ASEAN Regional Centre for Biodiversity	March 2005	8-7-2009 (Ratification)			MOECAF/FD
35.	International Tropical Timber Agreement (ITTA), Geneva, 2006	5-8-2011	12-9-2011 (Ratification)			MOECAD/FD
36.	Montreal Amendment, 1997 and Beijing Amendment, 1999 to the Montreal Protocol on Substances that Deplete the Ozone Layer, 1997	-	30-1-2012 (Accession)		32/2011 8-11-2011	MOECAF/ECD
37.	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Basel, 1989	-	6-1-2015 (Accession)	6-4-2015		MOECAF/ECD