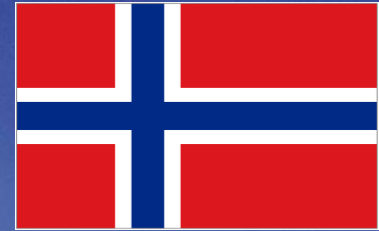




Myanmar World Water Day 2017



Pilot Testing the River Basin Management Approach in Bago Sub-basin

Nay Pyi Taw
March 13, 2017

Toe Aung, Forest Department and Ingrid Nesheim, Norwegian Institute for Water Research, NIVA,

Cooperation between Forest Department and NIVA – 2015-2018

Initiated with a visit by the Myanmar Minister, U Win Tun (MOECA) in Oslo 2012.

The IWRM project was developed as a collaborative effort during the project pre-phase – where a project steering group came to consist of representatives from FD / MONREC, IWUMD/MOALI, DWIR / MOTC and NIVA.

Project Facebook a platform for two-ways communication

Overall objectives of the project:

- ❖ Well-functioning IWRM system implemented for inland waters at the national level
- ❖ Management of water resources in line with National Water Framework Directive (NWFD)

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Two policy frameworks in Myanmar

- **National Water Framework Directive (NWFD)**
- **National Water Policy (NWP)**

have been published promoting Integrated Water Resources Management (IWRM); these are important reference documents in the project.

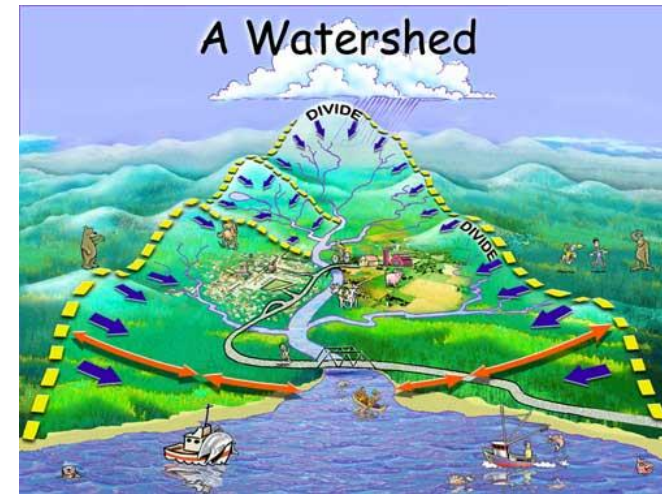
It has been decided to use the **EU Water Framework Directive (EU WFD)** as an important *international* reference framework for IWRM in the project.

The EU WFD focuses on:

- River Basin Management
- Coordination of sector and environmental authorities
- Stakeholder involvement

Pilot testing the river basin management approach in the Bago Sub-basin, a project component of the IWRM project

- Coordinated water management for surface waters, the marine influence area and ground waters within a *river basin*;
- Across administrative borders like states, regions, towns, and municipalities
- Integration of sector authorities, experts and disciplines, *involvement of stakeholders* - and the of use common thresholds and environmental standards



For the preparation of cyclic River Basin Management Plans

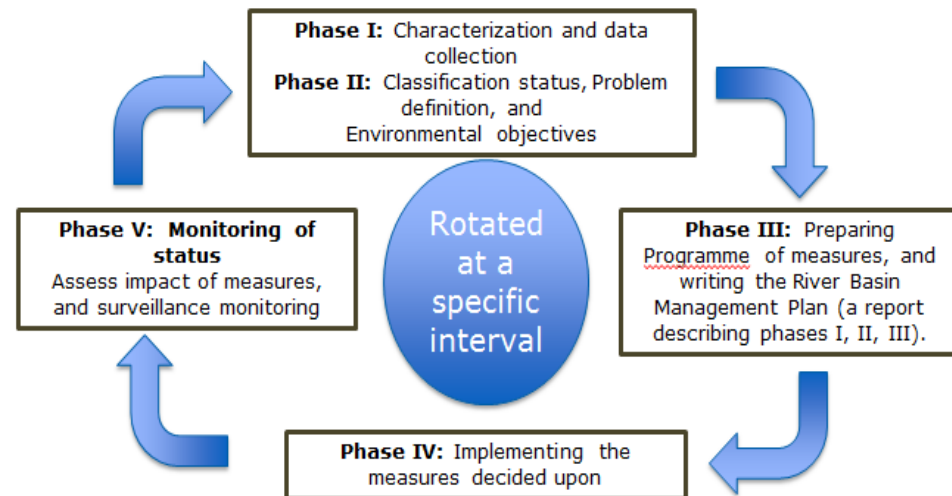
The River Basin Management Plan (RBMP)

1. Characterization of water bodies including; environmental status, water use and pressure impact analysis
2. Status classification, problem identification, and environmental goals
3. Programme of Measures

The plan sets the summary of actions to reach environmental goals:

Systematic water management

The above is followed by steps:
4. Implementation of Measures;
5. Monitoring and assessment



Delineation of Sittaung River Basin

Two workshops in Bago with 50 -60 attendants from different ministries were organized to discuss delineation of ***Sittaung River Basin Area, and Sub-basin Areas.***

Four alternatives were suggested, the figure shows the favored alternative.

This alternative considers the Bago-Sittaung canal combining the Sittaung River with the Bago River, an alternative also considering the political unity within the Bago District

A Bago Sub-basin management plan will be produced.



Bago Sub-basin Area Committee

embraces all relevant sector and environmental authorities within the administrative units of the Bago Sub-basin Area.

Non- Governmental Stakeholder Group

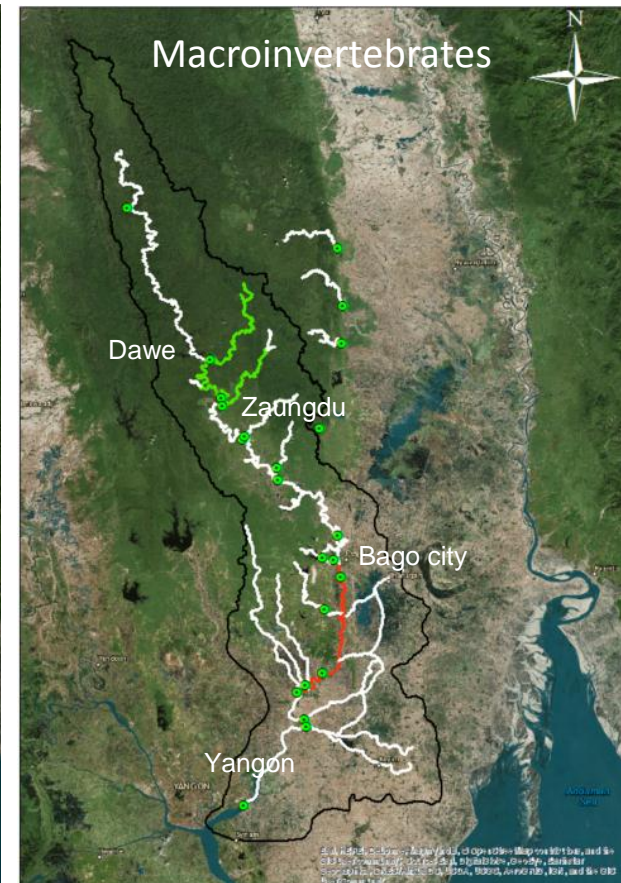
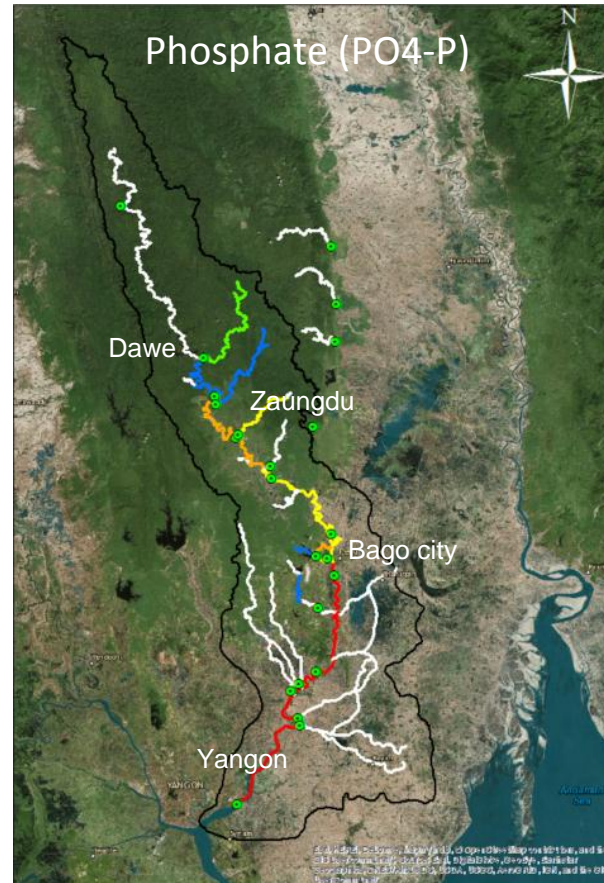
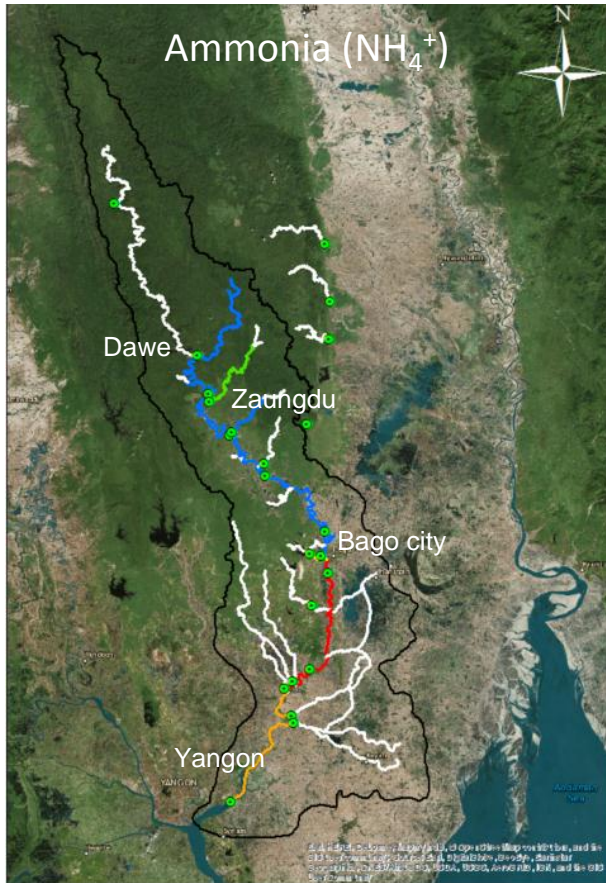
Embraces people from NGOs, CBOs, private actors, and civil society members.

The two groups meet regularly to discuss prioritized management issues, environmental objectives, the program of measures for the development of the Bago Sub-basin Management Plan.



Characterization in Bago Sub-basin

Status	Code	"Reference condition"
High		Acceptable ecological condition
Good		
Moderate		Action needed for achieving acceptable ecological status
Poor		
Bad		



Ammonia (NH_4^+) is a gas that is produced by bacteria and animals when they decompose organic matter. High levels are harmful to biology

Phosphate ($\text{PO}_4\text{-P}$) may enter the river from sewage (toilets), agricultural fields (fertiliser) and animals.

Macroinvertebrates show responses to organic pollution in Bago River

Prioritized management issues discussed in Bago Sub-basin area Committee, and Bago Non-governmental Stakeholder Group

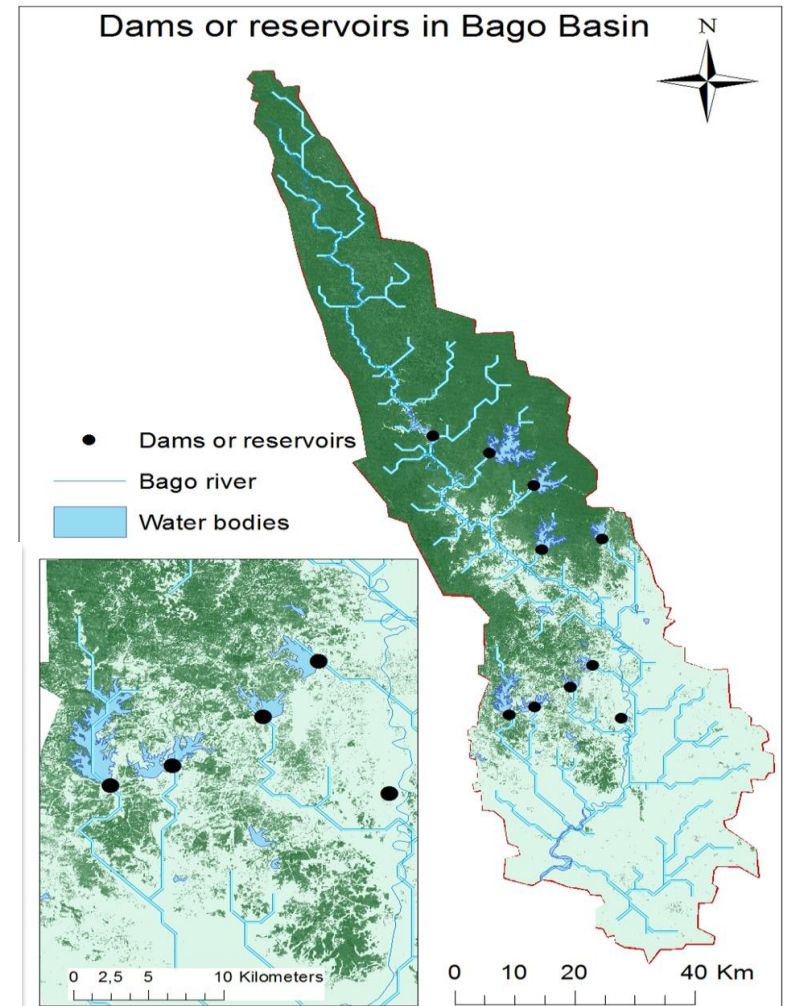
Bago township	Thanatpin ts	Kawa ts	Waw ts
<p>Sewage</p> <p>Garbage</p> <p>Sand mining</p> <p>Industrial waste</p> <p>River Bank Erosion and Sedimentation</p>	<p>Salt water intrusion</p> <p>Invasive shell species destroying the paddy fields</p> <p>High concentration of phosphorus and nitrogen</p> <p>Ground water pollution</p> <p>River Bank Erosion and Sedimentation</p>	<p>Salt water intrusion</p> <p>Invasive shell species destroying the paddy fields</p> <p>High concentration of phosphorus and nitrogen</p> <p>River bank erosion and sedimentation</p>	<p>Salt water intrusion</p> <p>Invasive shell species destroying the paddy fields</p> <p>High concentration of phosphorus and nitrogen</p> <p>River bank erosion and sedimentation</p>

Environmental objectives and Water body types (discussed in meetings Nov 2016 and 2017)

A water body is exposed to *similar pressure types* (factories, agriculture, towns, dams), and *it is linked to the same environmental objectives*

Five suggested water body types:

- Protected areas (wetlands and biodiversity)
- Dams for irrigation and drinking water
- Upstream Bago (deforestation)
- Bago city (sand mining, sewage, waste)
- Downstream Bago (sand mining , main pressure agricultural area)

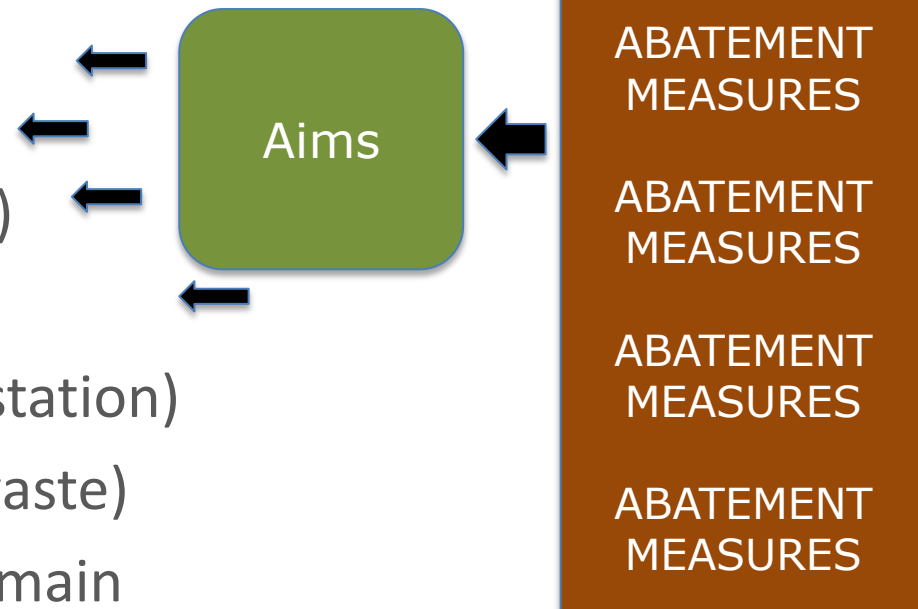


Abatement measures and water body types

A **water body** is exposed to *similar pressure types* (factories, agriculture, towns, dams), and it is linked to the same environmental objectives. Monitoring is ongoing in 35 samples sights in Bago.

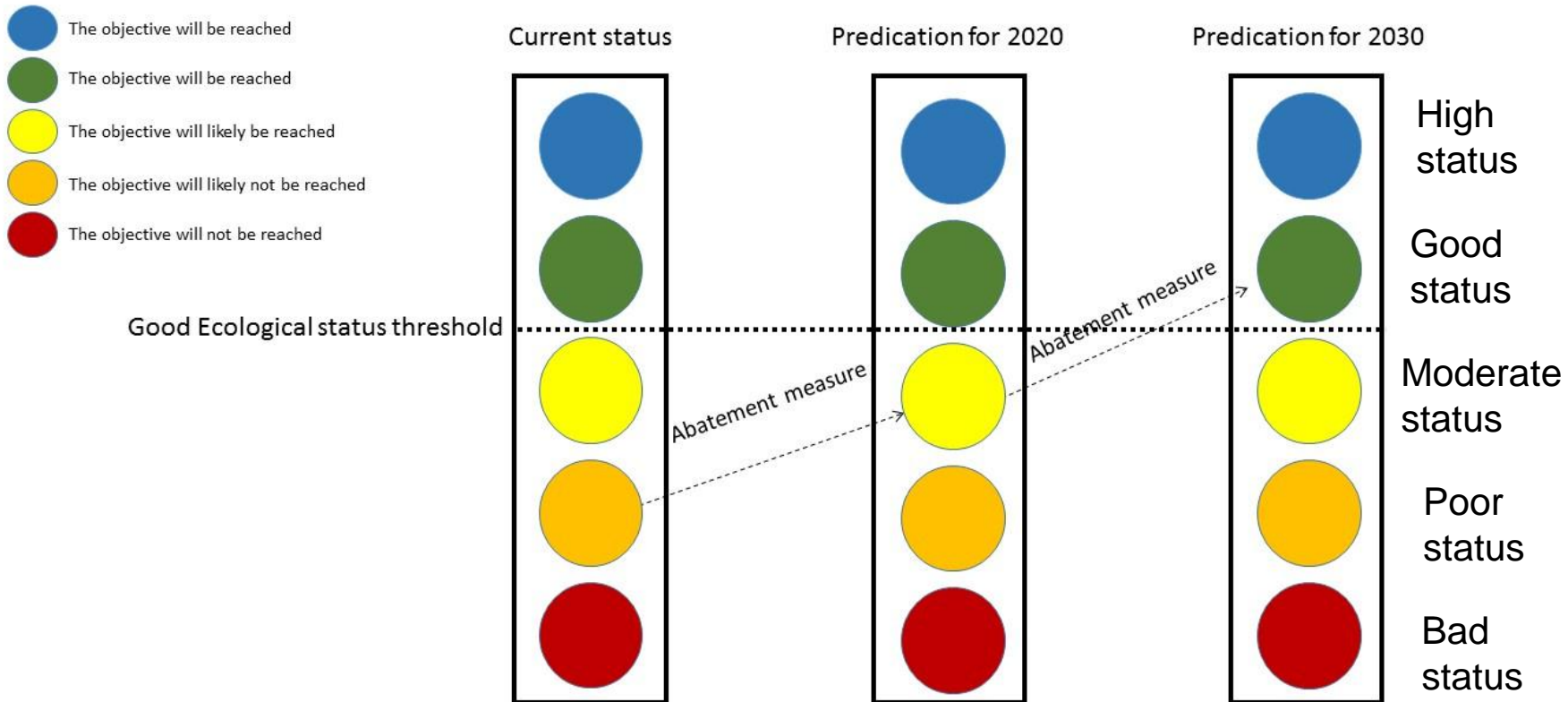
Five suggested water body types:

- Protected areas (drinking water ...)
- Dams for irrigation
- Land-use up-stream Bago (deforestation)
- Bago city (sand mining, sewage, waste)
- Down-stream Bago (sand mining, main pressure agricultural area)



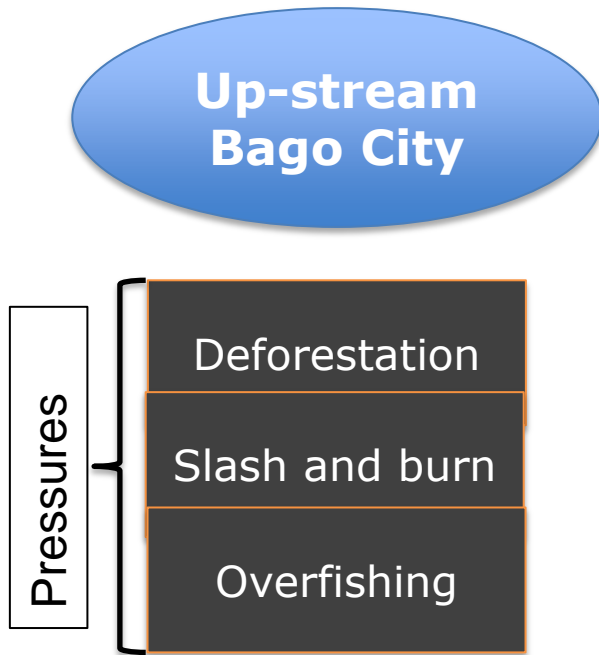
Environmental Goals and Abatement Measures

Environmental goals



Up-stream water bodies and abatement measures

Examples of possible abatement measures:



- Reforest along river banks/ Vegetated Buffer Strip along the river bank
- Reduce conventional plantations
- Resettlement of illegal settlement in critical watershed area
- Give no permit to the rubber plantations in the critical watershed area



Upstream Bago City, some first suggestions of abatement measures

Abatement Measures	Responsible Institutions	Regional/ District or Township Level
Reforestation and Rehabilitation (e.g. Kan Daw Gyi watershed area)	FD, GAD	Regional
Capacity Building and Training to local people how to use the pesticides and chemical fertilizers	Agriculture, GAD	Regional, District, Township
Establish watershed plantation, Community Forestry and River Bank wall construction to protect soil erosion	DWIR, FD, GAD	District, Township
Enforce rules and regulations, and public awareness to local people, not to dump near the river and in the river	GAD, ECD, Education Department, Health Department	Regional, District, Township
Sand mining (EIA/SIA, should permit and lincense rules and policy of current)	GAD, DWIR, ECD	Regional, District, Township

Major achievements

- Pilot establishment of Bago Sub-basin Area Committee and Non-governmental Stakeholder Group – with secretary and chair person.
- Monthly water sampling and analysis for water quality data in the Bago River.
- There is an ongoing process for the development of Bago Sub-basin management plan established which follows a systematic water management cycle reflecting the EU Water Framework Directive.

The plan is intended to deploy as a basic for RBMP of the whole country!

Thank you for your time and your attention!

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Myanmar: Pilot introducing the National Water Framework Directive

Ingrid Nesheim, Bente M. Wathne, Bo Ni, Zaw Lwin Tun

Myanmar, IWRM, Riv



Myanmar has an abundance of minerals and timber to damage related non-point source of pollution. The National Water Resources Committee work entitled, the National Water Framework Directive covers principles and stakeholder participation in the Sittaung River Basin. It is proposed to support the pilot in such a special sub-database, and water this pilot initiative.

Framework notes for Integrated Water Resources Management

RAPPORT L.NR. 7027-2016



A proposal for an administrative set up of river basin management in the Sittaung River Basin

By Zaw Lwin Tun, Bo Ni, and Sein Tun and Ingrid Nesheim

REPORT SNO 7013-

Norwegian assistance to Myanmar in the field of **Integrated Water Resources Management**
Institutional Building and Training

Policy Brief:

The River Basin Management Approach in the Sittaung River Basin



News Brief:

The National Water Quality Laboratory, Nay Pyi Taw

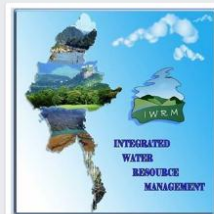


Introduction

Myanmar, previously known as Burma, has received international attention because of its rich natural resources including minerals, timber, and agricultural products. In the past as a colony, the country was ruled by the British and later by the military and is now a constitutional democracy. The country's economic and political situation in the 1980s led to the military government's National Reconstruction Council (NRC) regulations to open the country to the private sector in 2011 and alongside diplomatic sanctions on the country until 2011.



Integrated Water Resources Management - IWRM



Integrated Water Resources Management -

Integrated Water Resource Management – Institutional Building and Training
Norwegian Institute for Water Research in Norway & Forest Department in Myanmar

