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

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Cooperation between Forest Department and NIVA – 2015-2018

Initiated with a visit by the Myanmar Minister, U Win Tun (MOECAF) 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.

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)
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
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

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 (PO4-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

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

- The objective will be reached
- The objective will likely be reached
- The objective will likely not be reached
- The objective will not be reached

Current status

Predication for 2020

Predication for 2030

Good Ecological status threshold

High status

Good status

Moderate status

Poor status

Bad status

Abatement measure

13.03.2017
Salar Valinia and Ingrid Nesheim
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

Aims:

- NWFD + Forest Policy + Fishery Policy + etc

Pressures:

- Deforestation
- Slash and burn
- Overfishing

Up-stream Bago City

Deforestation
- Slash and burn
- Overfishing

Pressures

Aims

Examples
Upstream Bago City, some first suggestions of abatement measures

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