Initiation of IWRM in Myanmar by River Basin Management and Ecological Status Assessment

Zaw Lwin Tun

Director

Irrigation and Water Utilization Management Department

NIVA

IWUMD

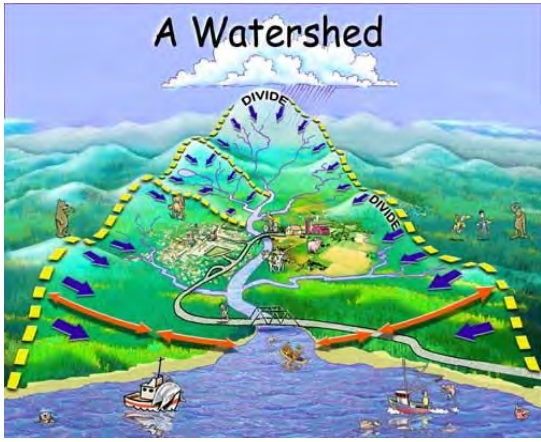
FOREST

IWRM, RBMA, RBMP

Integrated Water Resources Management (IWRM):

Good balance between water users, economy, and consideration of social issues as well as environmental issues taken care of

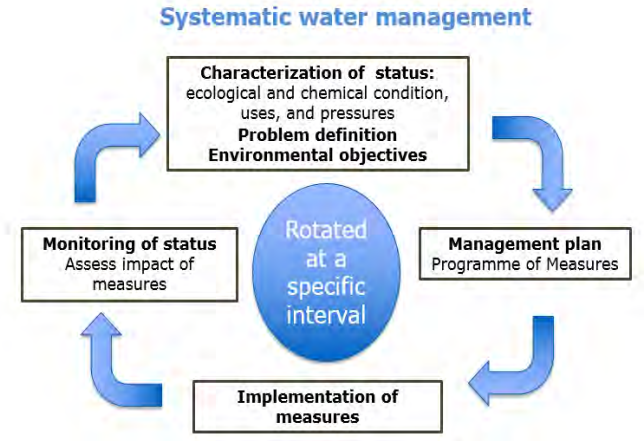
River Basin Management Approach (RBMA):



- 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 use of common thresholds as well as environmental standards
- For the preparation of holistic River Basin Management Plan RBMP

River Basin Management Plan (RBMP):

- A River Basin Area Committee (sector and environmental authorities within the river basin) is responsible for the production of RBMP
- The RBMP should be approved by national authorities



Ecological Status



SDGs

Safeguarding living oceans, rivers and lakes for the benefit, safety and enjoyment of present and future generations

Environmental objective / Chemical quality element

Environmental objective / Biological quality element

Environmental objective / Hydro-morphological quality element

GOOD ECOLOGICAL STATUS

No Eutrophication

Waters bodies free of contaminants

Healthy rivers, lakes and streams

Sufficient water flow

No soil erosion

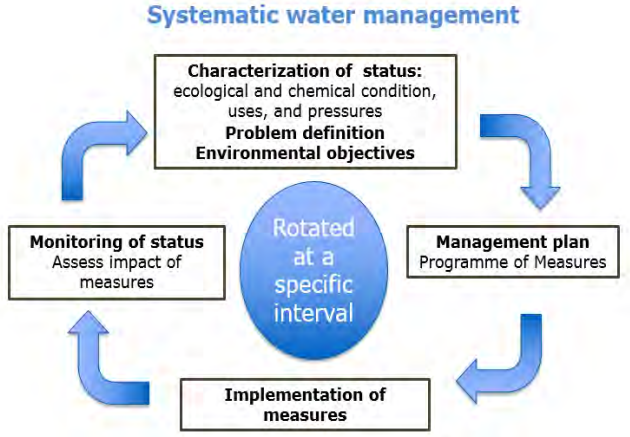
In Principle 3 (NWFD), ecological and chemical status refers to: (i) Biological quality (fish, benthic invertebrates, aquatic flora), (ii) Hydro-morphological quality such as status of river banks, river bank structures, river training works, river continuity or substrate of the river bed, (iii) Physical-chemical quality such as temperature, oxygenation and nutrient conditions and (iv) Chemical quality,

Objectives:

- Well-functioning IWRM System implemented for inland waters at the national level
- Management of Water Resources in line with NWFD

Pilot Case:

- Bago River Basin is considered as a Sub-basin Area of Sittaung River Basin
- Formation of Bago Sub-basin Area Governmental Stakeholders Committee and Non-governmental Stakeholders Group
- The aim is to develop a holistic Bago Sub-basin Area management plan for the improvement of the ecological status of waters



Performing Water Management Tasks

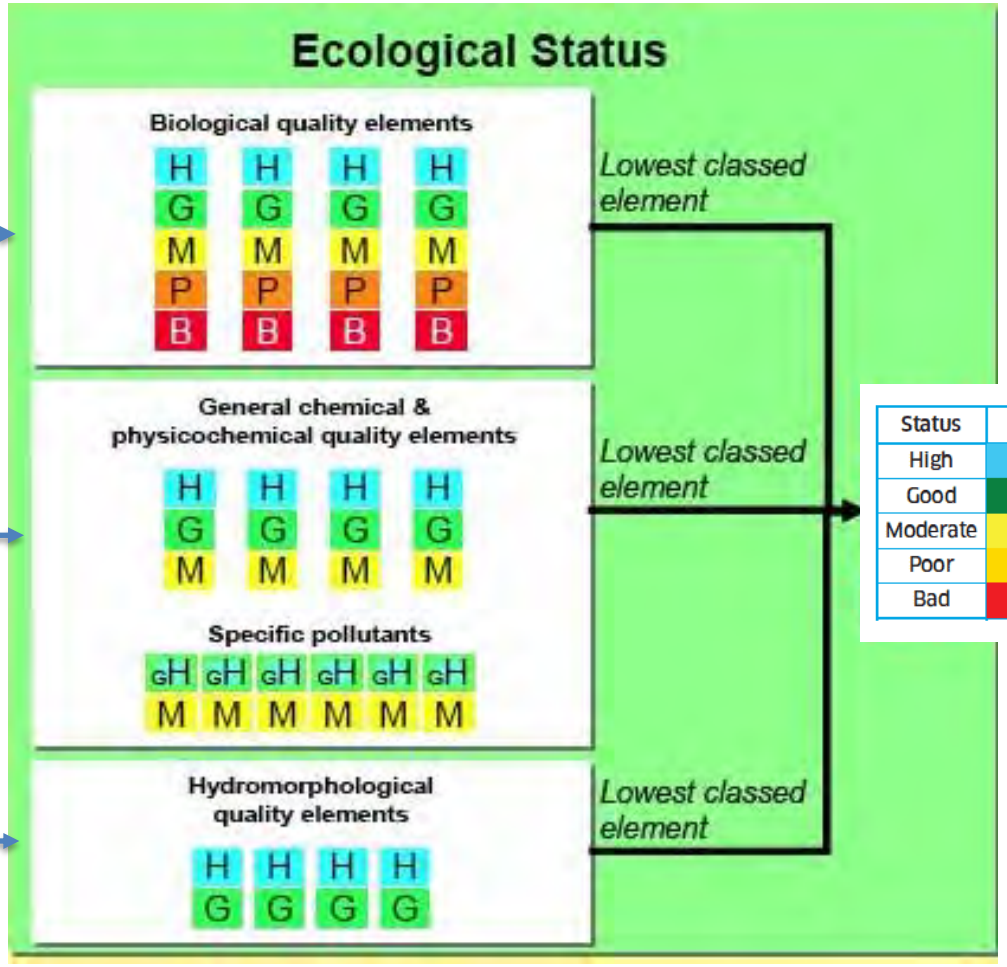
Performing Water Management Tasks in Bago R. Basin

Characterization of Bago Sub-basin

- Chemical, biological and hydro-morphological **monitoring** are undertaken in 35 water body stations
- **IWUMD** and **FD** are sampling in Bago River on monthly basis at 35 water body stations
- Samples are analyzed at IWUMD laboratory in Yangon, FRI laboratory in NPT, and at NIVA in Norway
- **Bago Sub-basin Area Characterization report** – an overview of water use, water users and pressure analysis as background for the assessment of ecological status of surface waters in Bago Riv
- Based on the ecological status, appropriate abatement measures are proposed and applied

Ecological Status

Ecological water quality criteria adapted to Myanmar conditions. Create an ecological status evaluation system that integrates antropogenic degradation of streams in Myanmar



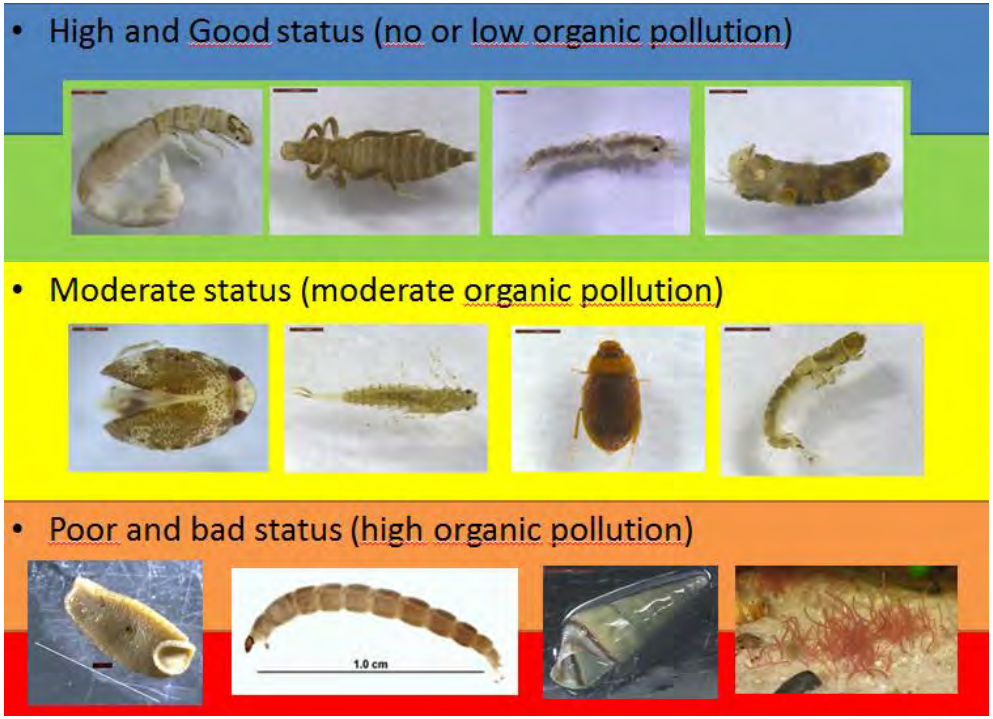
Ecological Status and Water Body Division

Ecological Status in-terms of Micro-invertebrates

Typically higher species diversity, and species sensitive to oxygen demand

Lower species diversity, loss of pollution sensitive species

Lower species diversity - species present low oxygen demand



Water Body Division Criteria:

- have similar geology/soil type, altitude and catchment area.
- not consider political boundaries.
- be exposed to similar types of pressures.
- have similar ecological status (*we do not know this yet*).

35 water bodies were created in the Bago River basin.

Conclusions

- Our monitoring suggest that nutrient enrichment (mainly phosphorous) possibly coming from agriculture (fertilizer), animals and humans (sewage inputs) is the main pressure in the Bago Sub-basin Area.
- This is especially so from Bago City and downstream. This finding is supported by both chemical and biological data (macro-invertebrates).
- We found a clear gradient in hydro-morphological degradation with the majority of water bodies being good/high condition: despite impact of dams this pressure are less significant in determining ecological status.
- So far, our monitoring data does not support metal pollution in the Bago River Basin.
- With these monitoring results appropriate abatement measures may be proposed and applied.
- It may be concluded that Initiation of IWRM by River Basin Management Approach and Ecological Status Assessment can be considered as Appropriate and Applicable Approach to implement the sound ecosystem management (good water cycle).

Thank you for your attentions

Zaw Lwin Tun
kozawlwin@gmail.com
IWUMD, MoALI