



Design and Implementation of Integrated Water Resources Management (IWRM) in Vietnam

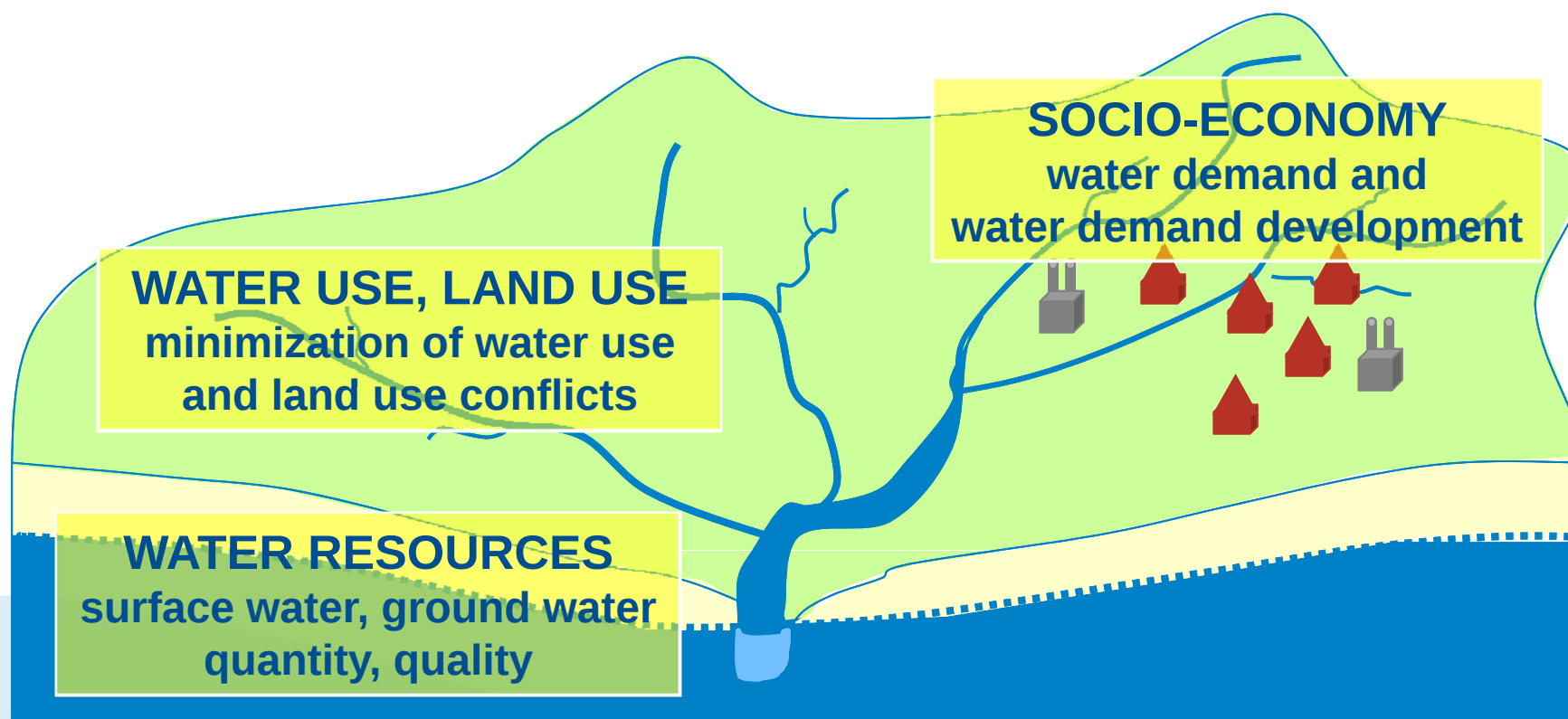
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Federal Ministry
of Education
and Research

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IWRM means integration of ...





IWRM is seen as ...

a way of avoiding or resolving conflicts over water resources and of achieving three key goals: equity, efficiency and sustainability.

IWRM is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. (Global Water Partnership, 2000)

The spatial unit of IWRM is a river basin, not divided by administrative boundaries.



Project Objectives

Development of a Planning and Decision Support System (DSS) for Integrated Water Resources Management (IWRM) in Vietnam:

- ☐ **Development of a method for the identification of present and future water related problems and deficits on the basis of river basins**
- ☐ **Development of a method for finding planning and decision alternatives for IWRM by combination of measures (water allocation, waste water treatment, water protection etc.)**



Project Structure

Part Project I

Development of a DSS for IWRM in Vietnam
Project Coordination

Part Project II Can Tho

IWRM/DSS for
Cuu Long part basin

Local
IWRM projects:
web-based monitoring,
waste water treatment
(rural)

Capacity building /
strengthening

Part Project III Lam Dong

IWRM/DSS for
Dong Nai part basin

Local
IWRM projects:
rural water supply and
sanitation

Capacity building /
strengthening

Part project IV Nam Dinh

IWRM/DSS for
Song Hong part basin

Local
IWRM projects:
waste water treatment
(industrial, urban)

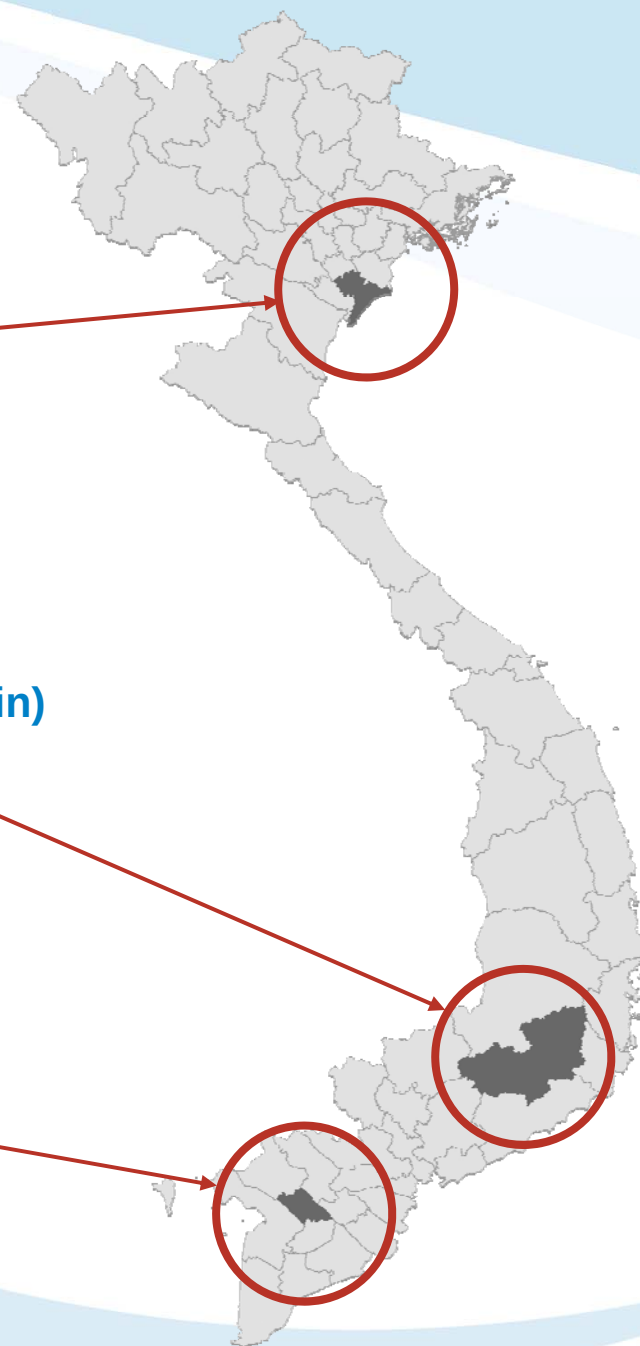
Capacity building /
strengthening

Project Structure

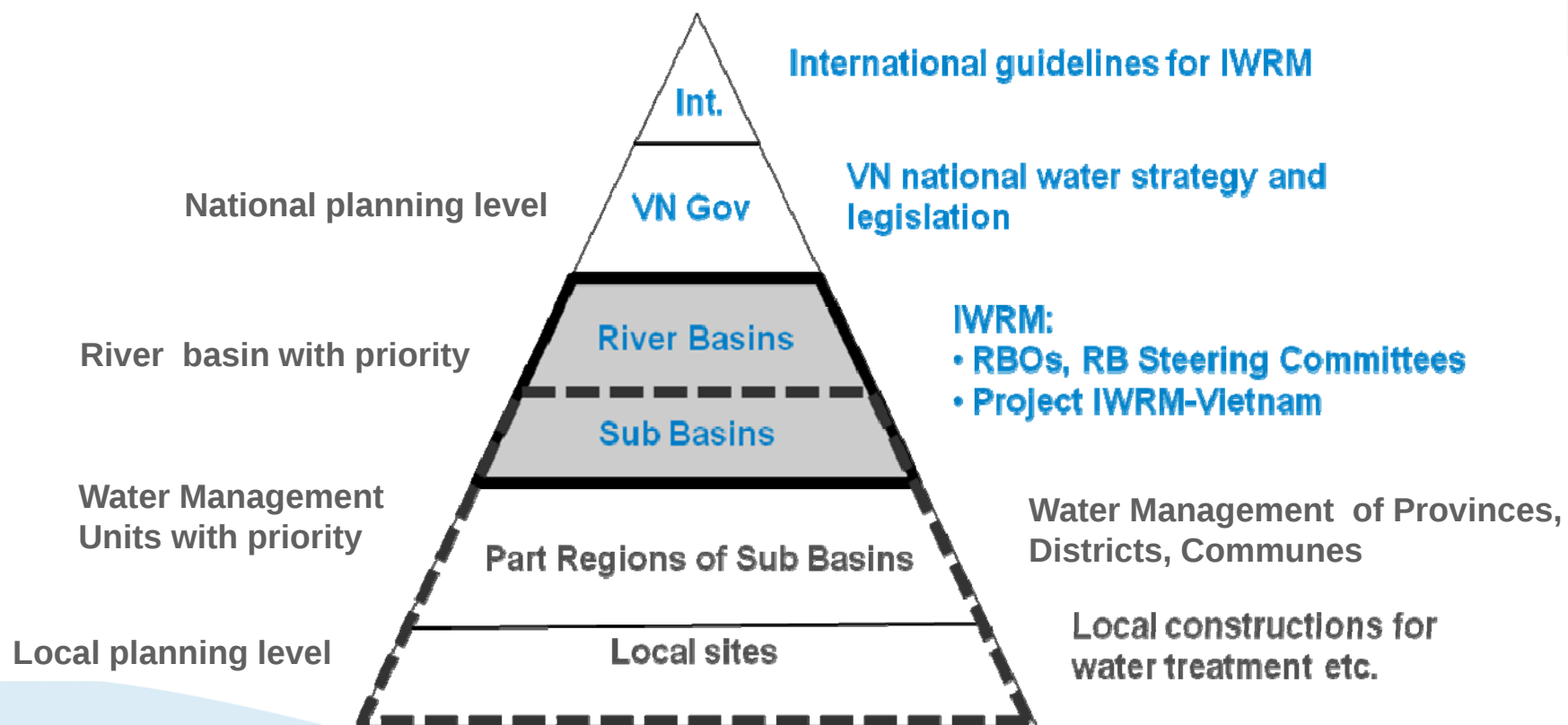
- ❑ **Nam Dinh Province**
 - Red River Delta (Song Hong part basin)
 - University of Greifswald

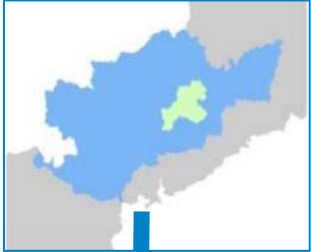
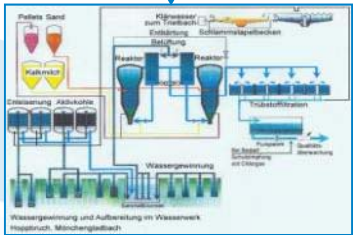
- ❑ **Lam Dong Province**
 - Southern Highlands (Dong Nai part basin)
 - University of Bochum

- ❑ **Can Tho City**
 - Mekong Delta (Cuu Long part basin)
 - University of Bonn

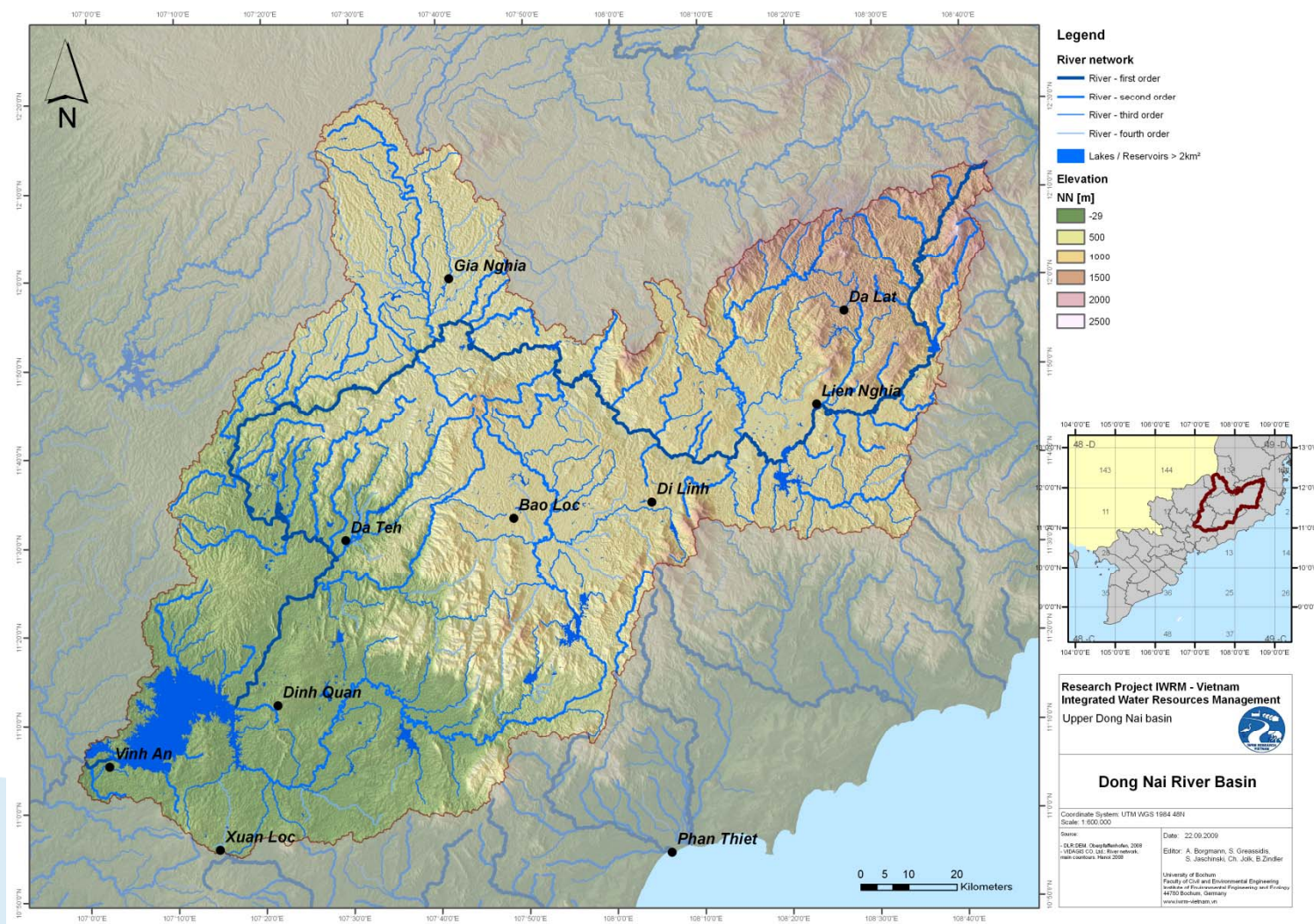


Water Management Planning Levels



Planning Level		Planning Objectives
1. National planning level		Identification of River Basins with higher problem intensity and need for measures with priority on water supply, waste water treatment, water body remediation etc. Scale ca. 1 : 1 000 000
2. River basins with priority		Identification of Water Management Units (WMUs) with higher problem intensity and need for measures with priority on water supply, waste water treatment, water body remediation etc. Scale ca. 1 : 300 000
3. Water Management Units (WMUs) with priority		Identification of most suitable locations for water management measures in the areas identified in planning level 2 (river basins) Scale ca. 1 : 50 000
4. Local planning level		Object planning for the locations and measures identified in planning level 3 (monitoring, waste water treatment and water extraction or water supply usw.) Scale ca. 1 : 1 000

River Basin Planning Level (Dong Nai)



Pressure - Intensification of Agriculture



deforestation



water demand



waste water non point sources

Pressure – Socioeconomic Development



water supply



domestic sewage



waste water point sources



Response

- ☐ forest planting and management
- ☐ reservoir construction
- ☐ pollution source management
- ☐ flood control
- ☐ irrigation development and management
- ☐ waste water management
- ☐ water environment protection
- ☐ salt control
- ☐ urban waste water drainage...

➔ Integrated Water Resources Management



Definition of Water Management Units

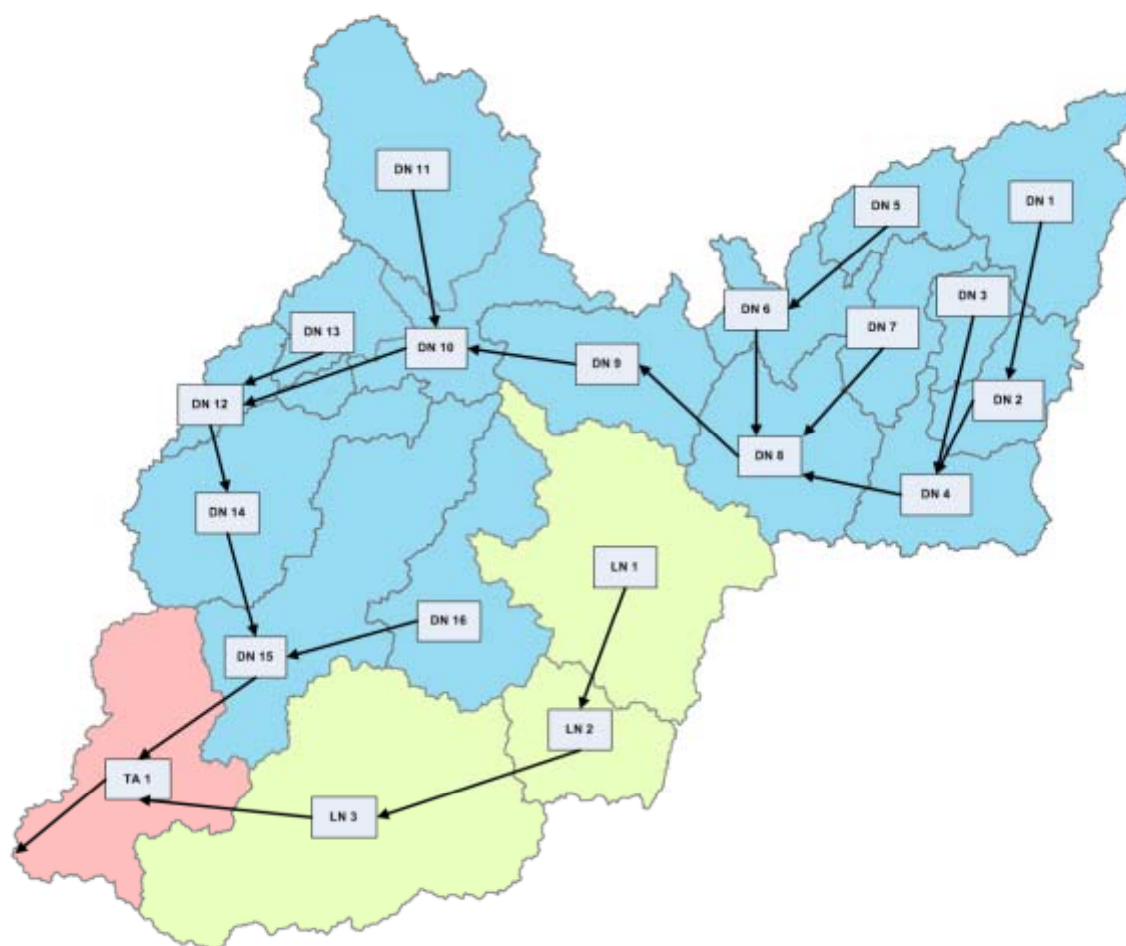
- ☐ Sub Basins of a river basin defined for the purpose of IWRM in the basin.
- ☐ Units should enable an effective management of both water quantity and water quality.
- ☐ Each WMU combines sub basins with similar management tasks that can be united appropriately.



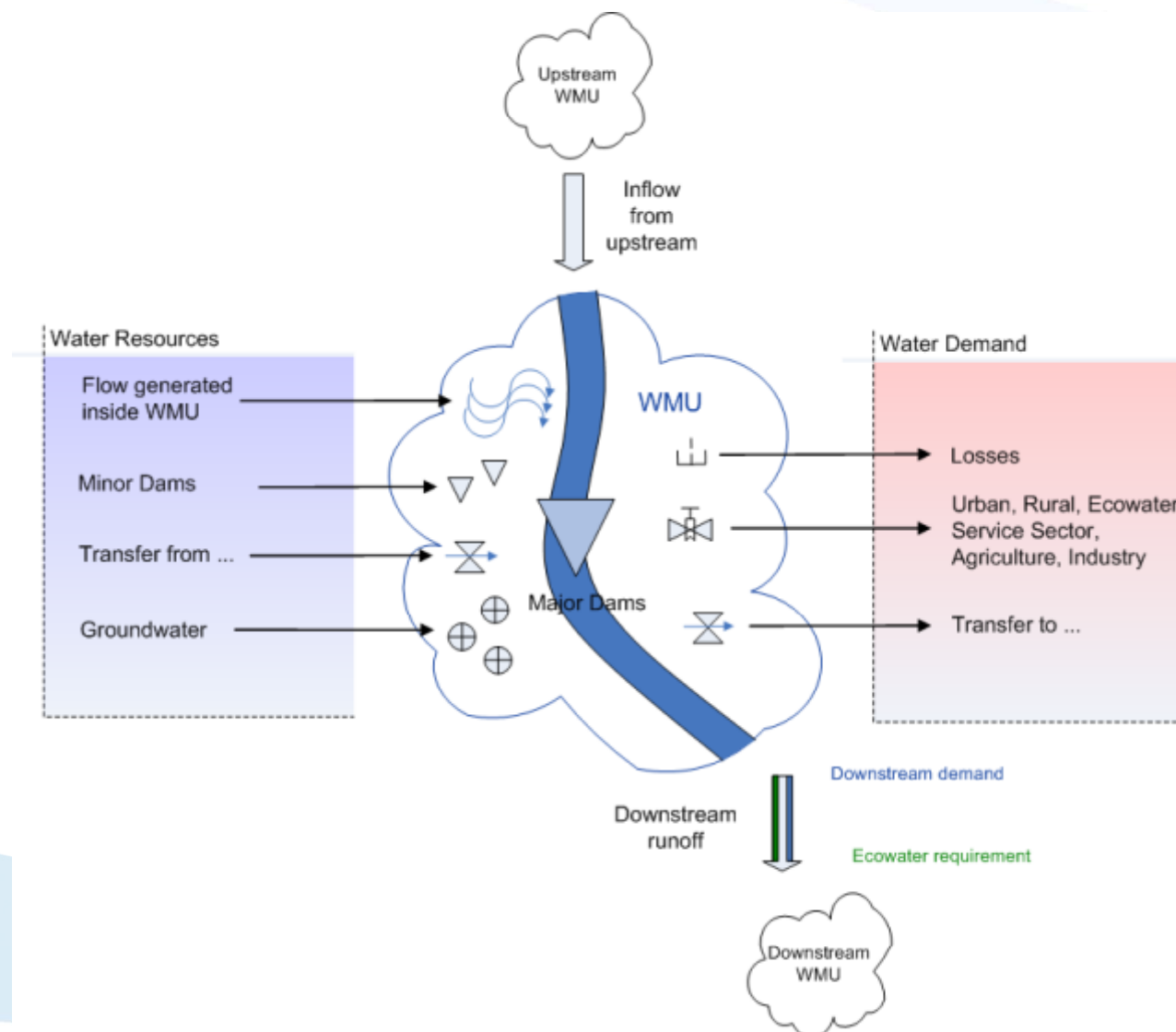
Criteria for the definition of Water Management Units

- ☐ Boundaries of the WMUs are defined along the natural river basins or sub basins for surfacewater and groundwater
- ☐ Natural river basins are subdivided at hydrologically significant points, and according to criteria of geomorphology and land use and administrative regions
- ☐ If natural river basins or sub basins do not exist (delta areas) the WMUs are divided along the main rivers or canals
- ☐ Each WMU is named using established local names (such as names of reservoirs, rivers or localities) and given a unique identity-number

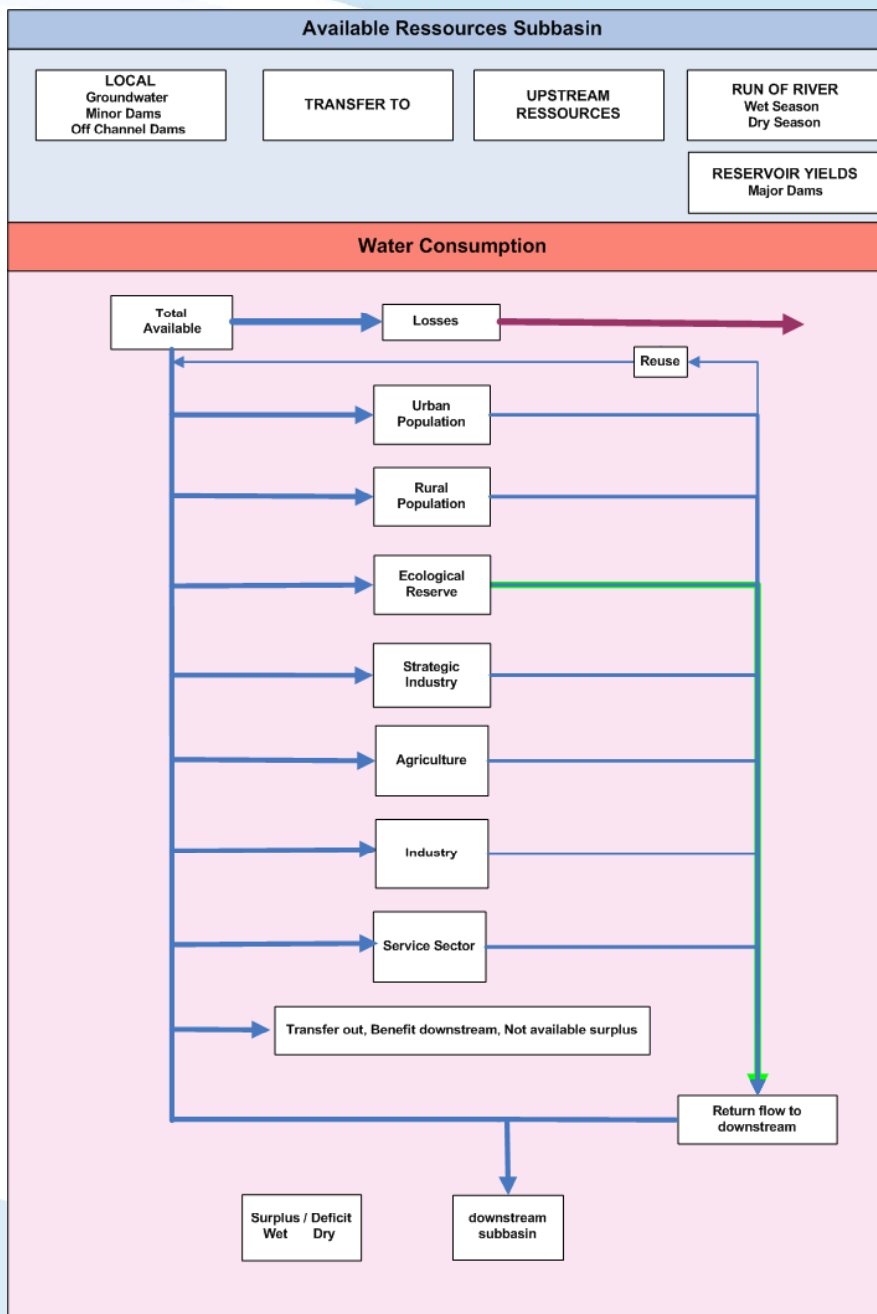
Water Management Units - Cascade



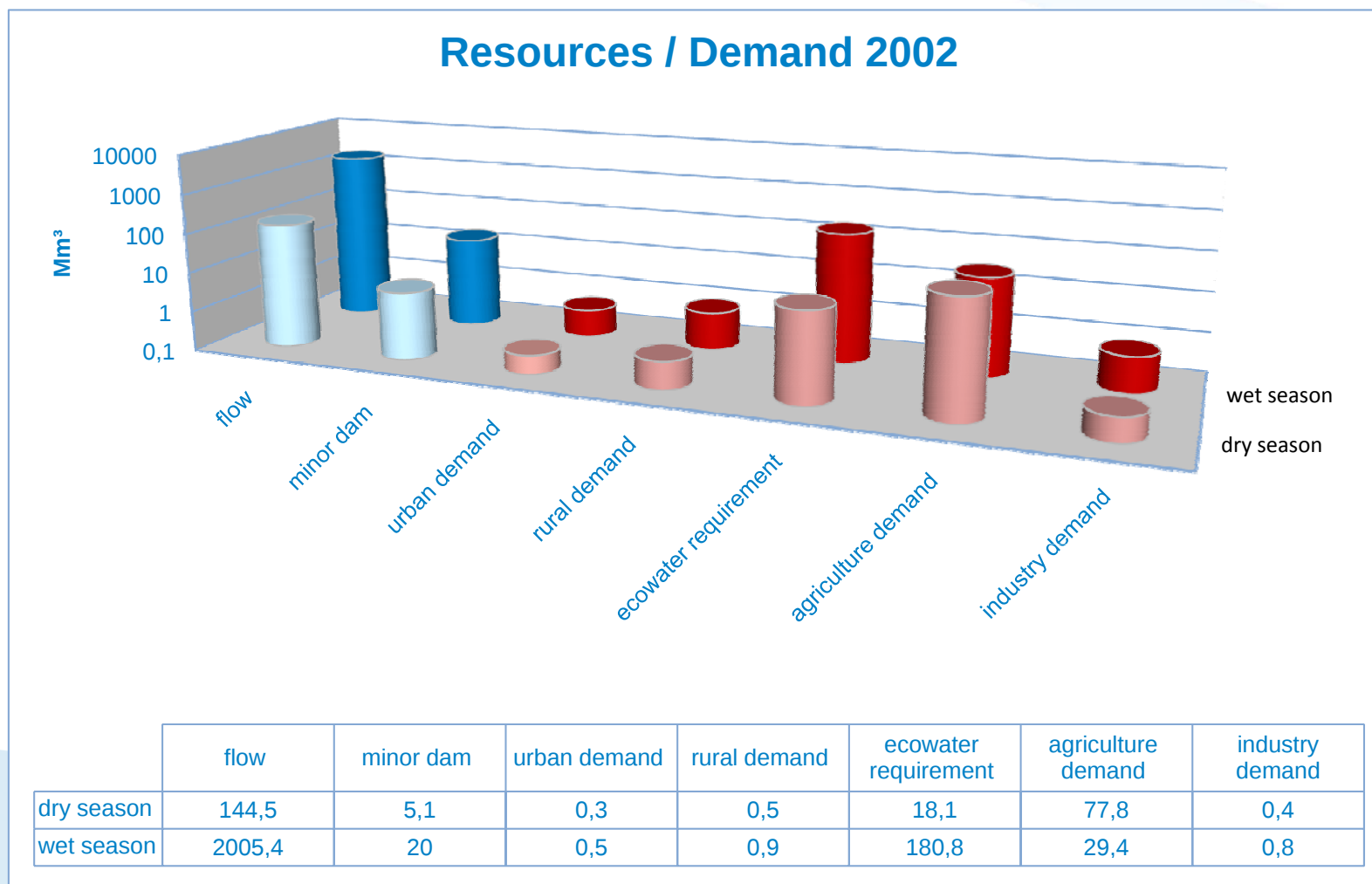
Water Balance Schema



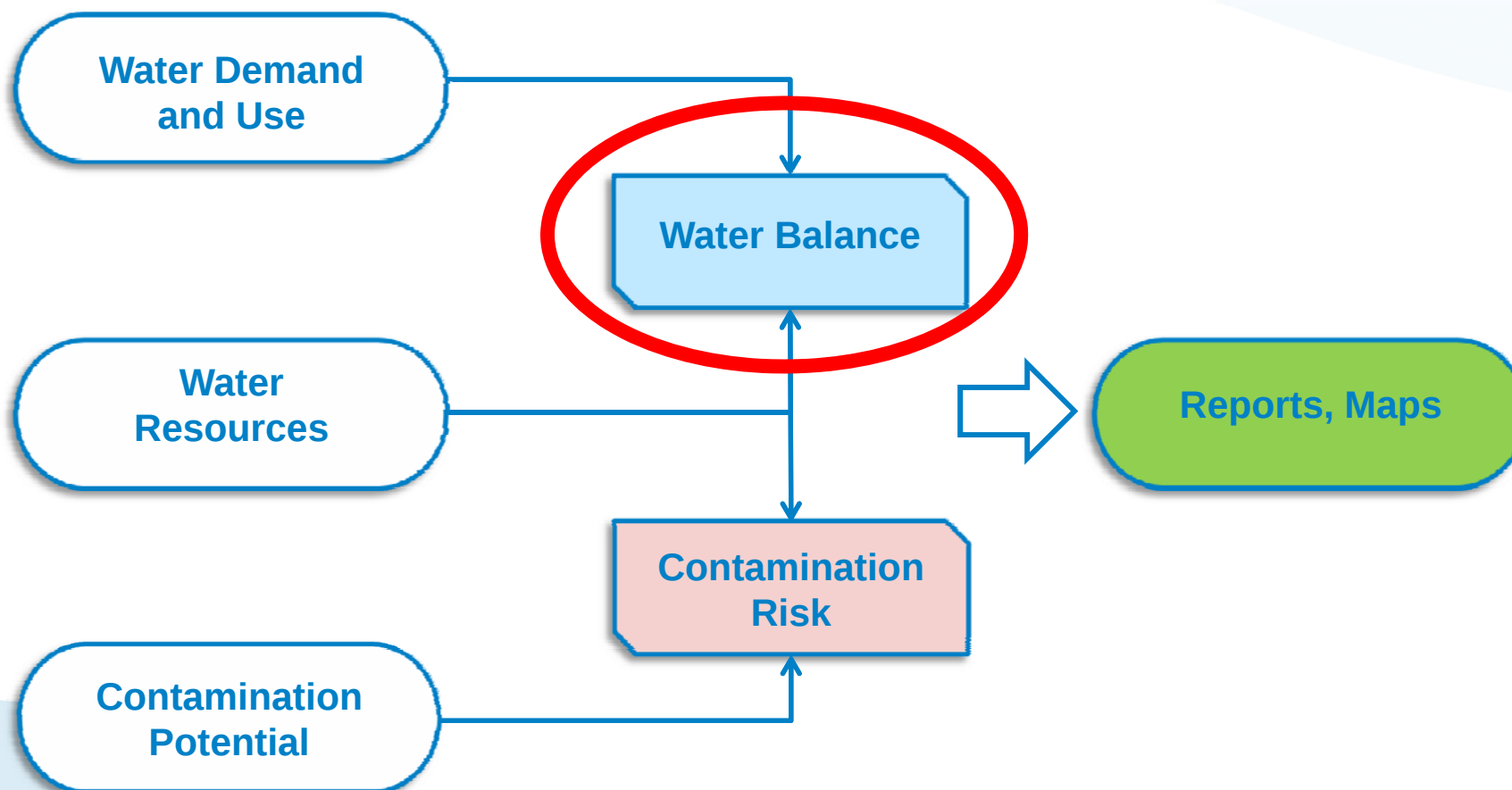
Water Balance



Water Balance Results - WMU DN11 - 2002



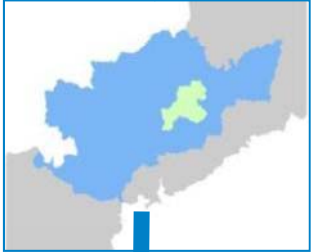
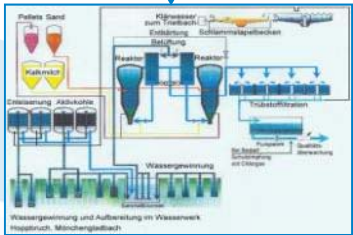
Evaluation, Aggregation



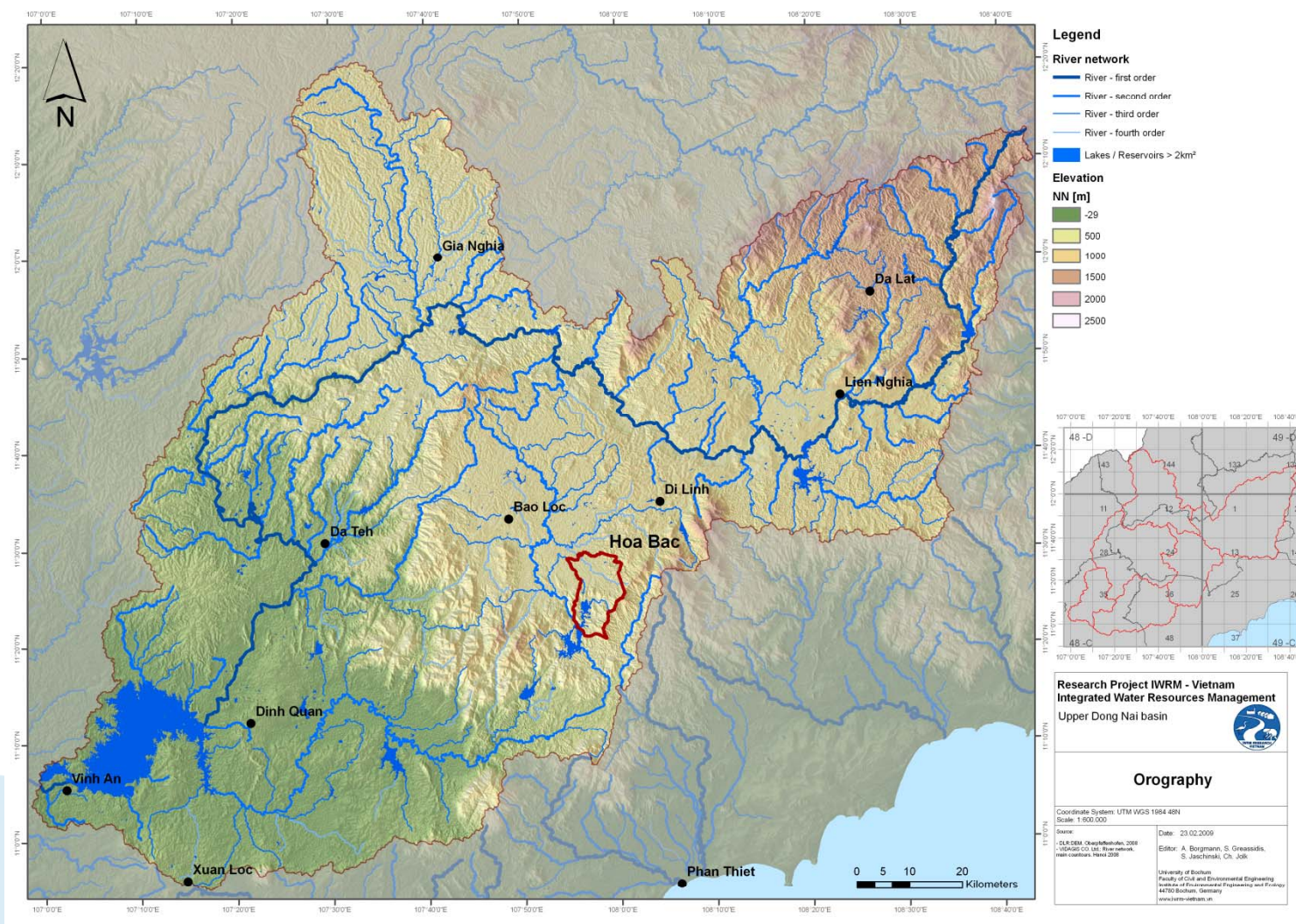


Conclusions

- ☐ Reports of the sub-basins: water demand, water resources, contamination, problem ranking, hot spots etc.
- ☐ Information about water allocation problems
- ☐ Measure proposals and cost estimates for IWRM

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Local Planning Level (Hoa Bac)

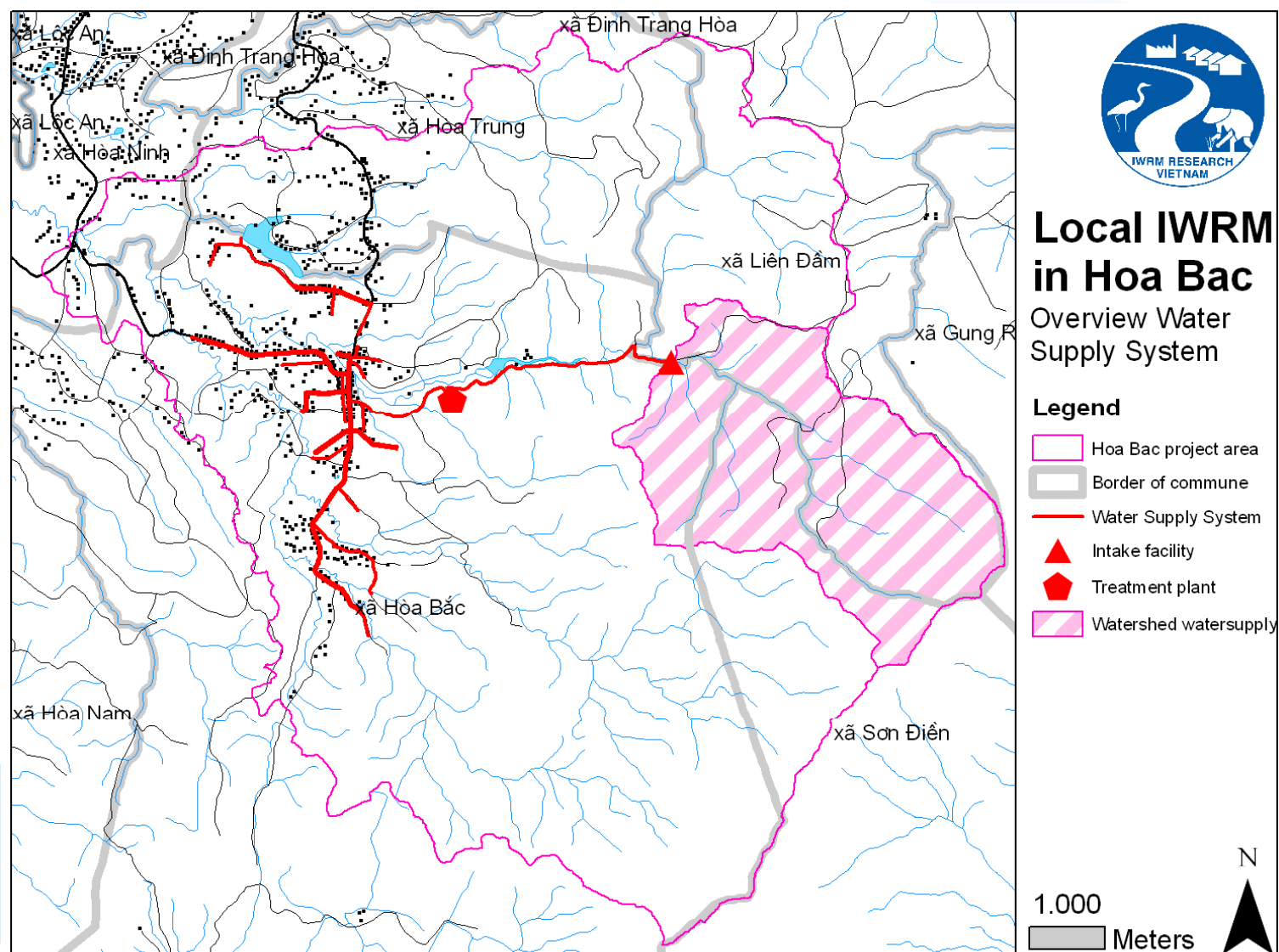




Local Planning Level (Hoa Bac)

- ❑ Objective: rural water supply and sanitation
- ❑ Supplies water to about 8000 people in Hoa Bac
- ❑ Water source is surface water from Dalahon stream
 - River water is abstracted by an intake facility
 - Water is treated by sand-filtration and chlor-disinfection
- ❑ The watershed of the water source covers an area of 13 km²
(Forest, rice and coffee cultivation)

Local Planning Level (Hoa Bac)



Local Planning Level (Hoa Bac)



February 17, 2010



Thank you for your attention !

www.iwrm.vn