

4.8. IMRR Project

Project	IMRR Project – Integrated and sustainable water management of the Vietnamese Red-Thai Binh River System in a changing climate
Organisation	Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB) at Politecnico di Milano
Research location	Milan, Italy
Cooperation partners	Institute of Water Resources Planning (IWRP), Ministry of Agriculture and Rural Development (MARD) in Vietnam
Team	Three senior researchers, four post-docs and five Ph.D students and three expert consultants
Funding sources	Italian Development Cooperation Agency; Institute of Water Resources Planning; Ministry of Agriculture and Rural Development
Websites	http://www.deib.polimi.it http://xake.elet.polimi.it/imrr

ORGANISATIONAL BACKGROUND ●●●

The research is coordinated by the [Planning and Management of Environmental Systems](#) group of the Dipartimento di Elettronica, [Informazione e Bioingegneria at Politecnico di Milano](#). The goal of this research group is to develop mathematical models for quantitative analysis and management of environmental systems, thus promoting more efficient and sustainable use of natural resources and contributing to the adoption of transparent, shared decision-making procedures. The main partner in Vietnam is the Ministry of Agriculture and Rural Development's Institute of Water Resources Planning ([IWRP](#)). The participatory modelling approach adopted is representative for the group's standard approach to modelling for integrated resource management. Three Ph.D and four MSc scholarships at Politecnico di Milano have been granted to Vietnamese students as part of the project and all of them are working for the Vietnamese Government in the water management domain.

FUNDING ●●●

Three funding sources are mentioned: Italian Development Cooperation, the Institute of Water Resources Planning, and the Ministry of Agriculture and Rural Development.

PROBLEM BEING ADDRESSED ●●●

The IMRR project aims to develop and promote strategies for the sustainable and participatory management of water resources in the Red-Thai Binh River (RTBR) system, also referred to as the Red River, the largest river basin in Vietnam. This river region includes the Hanoi capital and other 25 provinces, with a total population of 26 million. This region is experiencing rapid

GRAND CHALLENGE BEING ADDRESSED ●●●

Water resource management is a key issue in the path toward sustainability, especially in a fast-developing country like Vietnam, which relies on water resources for many economic activities. Water availability can create conflicts between different users at various times and under a variety of conditions.

The main issues to be tackled and addressed by the project are:

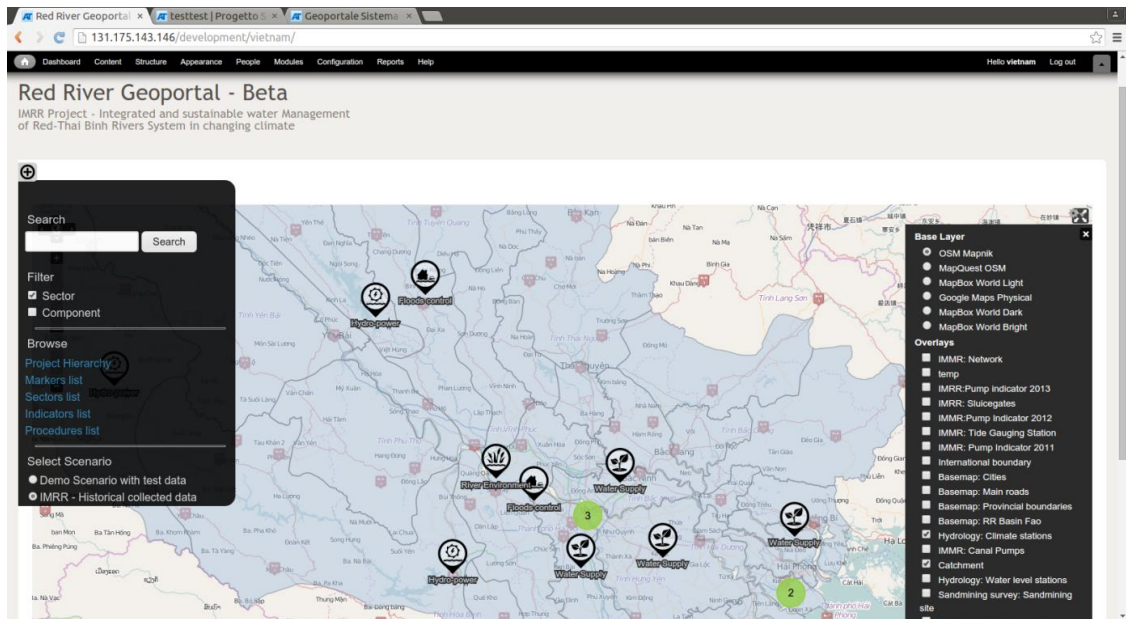
- Improved handling of water allocation and distribution conflicts between the varying water needs of private and public actors;
- Minimisation of economic losses (for agriculture and hydropower sectors), reduction of the risk of flooding and enhancement of environmental quality through more effective and sustainable water allocation and distribution.

RESPONSIBLE RESEARCH AND INNOVATION ●●●

The IMRR Project adopts a participatory approach which is intended to include all relevant stakeholders in the planning process, thereby integrating distributed and field-specific expertise at every stage in the project. The stakeholders represent diverse organisations: four different Ministries (Agriculture, Natural Resources and Environment, Industry, Transport), the Central Commission for Storms and Flood Control, the National Power Company, Provinces and Irrigation Districts, Vietnamese universities and research centres. The project aims not to provide a single, closed solution for water resource planning and management in the Red River basin but to equip Vietnamese institutions with tools and capacity.

The integrated water management approach allows actors to share knowledge and information. The IMRR project supports this process at various levels through the provision of various different tools:

- Ongoing research has been discussed at annual public meetings (the so-called “Basin Meeting”), which are open to all relevant stakeholders and chaired by the Vice-Minister of MARD (Ministry for Agriculture and Rural Development);
- Data collection and indicator definition has been supported by the project website, which is powered by MediaWiki technology and promotes continuous review and sharing of the knowledge base;
- Project reports, providing descriptions of all technical aspects and implementation details, have been published on the website throughout the duration of the project;
- Several training courses have been systematically provided at the IWRP offices on a regular basis throughout the duration of the project, addressing specific topics (e.g. climate change impact assessment, participatory water management);
- The Red River Geoportal, a web based, open source, spatial data infrastructure, has been developed to share, visualise, analyse and compare different strategies for the management of the Red River water system. At the last Basin Meeting, Red-TwoLe was officially delivered by Italian Ambassador to two Vietnamese Ministries, MARD and MoNRE (Ministry of Environment and Natural Resources), and it has been installed and configured on the server of the Vietnamese partner. A demo version of the Geoportal has also been installed on a [server](#) at Politecnico di Milano.



Stakeholder participation has benefited the research through:

- Consideration of aspects not included in the original proposal, such as the analysis of geomorphological changes, the implementation of additional software tools, or direct involvement of MoNRE in project development and delivery of outputs.
- An annual focus group, called the Strategic Group, comprising experts in all sectors. This group defined a set of meaningful indicators and evaluation criteria, through which the experts identified possible compromise management strategies to be recommended to the water authorities for adoption and implementation. Input from the Strategic Group was used to adapt the research where needed, for instance, in developing new scenarios and indicators.
- A politically sensitive line of inquiry was further developed in the project focusing on illegal sand mining in the river. This was done in response to feedback from the stakeholders.

The researchers were aware that they were operating in a political environment; for example, they encountered corruption and had to consider how to deal with this in an ethical way.

EVALUATION AND DISSEMINATION ●●●

The team is relatively small but well embedded in the Vietnamese stakeholder context and builds upon extensive experience with participatory modelling. The methodology and results developed during the project represent state-of-the-art techniques and valuable scientific findings, as demonstrated by the 24 publications in international scientific journals and the 49 contributions to several international conferences. Journals in which the research team published include *Water Resources Research*, *Journal of Water Resources Planning and Management*, *Environmental Modelling & Software*, *Geomorphology*, *Water Resources Research and Hydrology and Earth System Science*. The findings are also presented to governmental organisations and ambassadors and there has been a national television appearance in Vietnam. The methodology and research approach of Red-TwoLe has been designed to be adaptable and flexible, in order to replicate the planning process in other Vietnamese water systems.