



United Nations
Educational, Scientific and
Cultural Organization



International
Hydrological Programme

INTERNATIONAL SEDIMENT INITIATIVE [ISI]



International Hydrological Programme
Division of Water Sciences

THE CONTEXT

Sediment management is an important component of sustainable water resources management. Across the world, erosion, transport and sedimentation processes have significant social, economic and environmental impacts. Every year human lives are lost to erosion, landslides and debris flows. More than fifty percent of the original storage capacity of the world's reservoirs is likely to be lost within the next thirty years due to sedimentation. The sediment balance in catchments and river basins is altered by human activities, producing social, economic and environmental repercussions. The negative impacts of erosion and sedimentation are further exacerbated by global changes brought on by a rapidly growing population and increased vulnerability to severe climatic conditions, which increase soil erosion. However, there are significant gaps in baseline sediment data, knowledge about sediment transport and understanding of socio-economic and environmental impacts. Sediment management practices need to be improved if we are to overcome erosion and sedimentation problems.

Facts about Water, Erosion & Sedimentation

- Erosion is defined as the wearing away and transport of the land surface by running water, glaciers, wind or waves. Sedimentation is the process of settling and deposition of both suspended matter and coarse material in water under gravity.
- Water transforms landscapes and redistributes large amounts of both fine-grained and coarser material as sediment. Sediment is eroded from the landscape, transported by river systems and eventually deposited in rivers, wetlands, lakes, reservoirs, estuaries or the ocean.
- Material mobilized by erosion is transported when exposed to fluvial processes in streams and rivers. Deposition occurs on river beds, bars and islands in river channels, flood plains and deltas, and considerable amounts of sediment are trapped in lakes and reservoirs.
- Erosion, transport and deposition of sediment are natural processes and high sediment loads can occur naturally in arid and semi-arid areas where the vegetation cover is low and high intensity rainfall is common. However, disturbance of the natural system by land use change, agriculture and other human activities has greatly increased erosion and sediment transport in many areas of the world.

Information from the 2nd United Nations World Water Development Report, "Water, a shared responsibility" and from the "International Glossary of Hydrology".



MISSION STATEMENT

ISI: Linking Science with Policy & Management Needs

ISI promotes sustainable sediment management at the global scale in an effort to contribute to sustainable water resources management. The initiative assesses erosion and sediment transport by rivers to lakes, reservoirs and marine environments, aimed at the creation of a holistic approach for the remediation and conservation of surface waters.

The initiative focuses on sediment quantity and quality, as well as the economic, social and ecological aspects related to erosion and sedimentation. ISI aims to develop a decision support framework for sediment management, in order to provide guidance on legislative and institutional solutions, applicable to various socio-economic and physiographic settings, in the context of global change.

Supporting the Global Agenda for Sustainable Sediment Management

Within the framework of sustainable water resources management, ISI is a contribution to global sustainable sediment management. The initiative's outcomes contribute to the Millennium Development Goals (MDGs), the World Water Assessment Programme (WWAP), World Water Development Reports (WWDR) and other global efforts. The initiative will also help highlight the importance of sustainable sediment management within the context of the two United Nations Decades: "Water for Life" and the "Decade for Education for Sustainable Development".

Objectives: Monitoring, Analysis & Policy Advice

- ISI encourages international cooperation in managing regional sediment problems and in finding local solutions, such as better advice for policy development and implementation.
- ISI promotes the collection, analysis and interpretation of sediment data, as well as the exchange and use of appropriate methods and procedures for sediment management.

ISI at a Glance

The International Sediment Initiative (ISI) was launched by UNESCO's International Hydrological Programme (IHP) in 2004. The secretariat for the initiative is provided by the International Research and Training Centre on Erosion and Sedimentation (IRTCES) in Beijing, China.

ISI Activities:

- Global Evaluation of Erosion and Sediment Transport (GEST Project);
- Case studies illustrating the socio-economic and environmental risks caused by erosion and sedimentation processes;
- Comprehensive review of global erosion and sediment-related research;
- Education and capacity building for sustainable sediment management; and
- International cooperation within the UN system and with regional networks, NGOs and other international associations active in this field.

ISI ACTIVITIES

ISI activities aim to increase awareness of erosion and sedimentation dynamics and sediment issues in all spheres of water management. The initiative promotes sustainable management of soil and sediment resources at local, regional and global scales.



Global Evaluation of Erosion and Sediment Transport (GEST Project)

The GEST Project entails the development of a global repository for data, information and documentation on soil erosion, sediment transport and sediment-related issues, which will serve as the basis for a global assessment of erosion and sedimentation problems, and their social and economic implications. The data and information base will be developed in existing international institutions, such as IRTCES (International Research and Training Centre on Erosion and Sedimentation) in China, GEMS/Water (Global Environment Monitoring System) in Canada, the ISIDE Observatory (Italian Seismological, Instrumental and Parametric Database) in Italy, etc.

The ISI Information System provides

- **Information access:** through the creation of a global information resource portal;
- **Information repository:** through the establishment of a global repository for data, information and documentation.
- **Information development:** through the implementation of strategic training activities.

Case Studies of River Basins as Demonstration Projects

Case studies are an effective means of raising awareness about erosion and sedimentation problems in different regions. These will provide examples of monitoring and data processing techniques, procedures and methodologies for analysis of environmental, economic and social impacts, and evaluation of management practices. Case studies of the Danube, Mississippi, Nile, Rhine, Volga and Yellow River basins have been prepared. Other case studies will follow. The data available from the case studies will be incorporated into the global database.

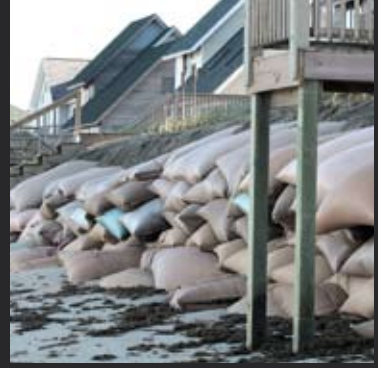
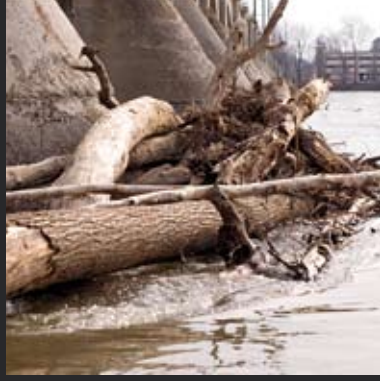
Review of Erosion & Sedimentation-Related Research

A survey of ongoing research is an important contribution to the development of sustainable sediment management, given the lack of knowledge concerning many aspects of erosion and sedimentation needed to address key sedimentation problems. Associations such as the International Coordinating Committee on Reservoir Sedimentation (ICCORES) and the World Association for Sedimentation and Erosion Research (WASER) could play substantial roles in this endeavor.

Education & Capacity Building for Sustainable Sediment Management

ISI promotes scientific conferences, workshops and seminars focusing on important issues relating to erosion and sediment transport, and deposition at the local, regional and global scale. International and local experts discuss problems at these meetings and develop proposals for solving them.

Within the medium term, the initiative will focus on identifying the modes of education at all levels while also taking into account regional priorities and interests in different socio-economic, ecohydrological and physiographic settings. This activity should take into account the information assembled by the GEST Project and the survey of sedimentation-related research. In line with its commitment to education and capacity building, ISI will encourage young scientists to become involved in its activities.



Networking

ISI is open to collaboration with all interested institutions – international, regional or national associations – in the interest of promoting sound and sustainable sediment management policies. ISI is eager to establish close working relationships with international, regional and national projects, programmes and networks, such as IAHS, WASER, ICCORES, ICOLD, GEMS/Water, IAHR, FRIEND, HELP, IFI, G-WADI, GEOSS and SedNet among others.



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