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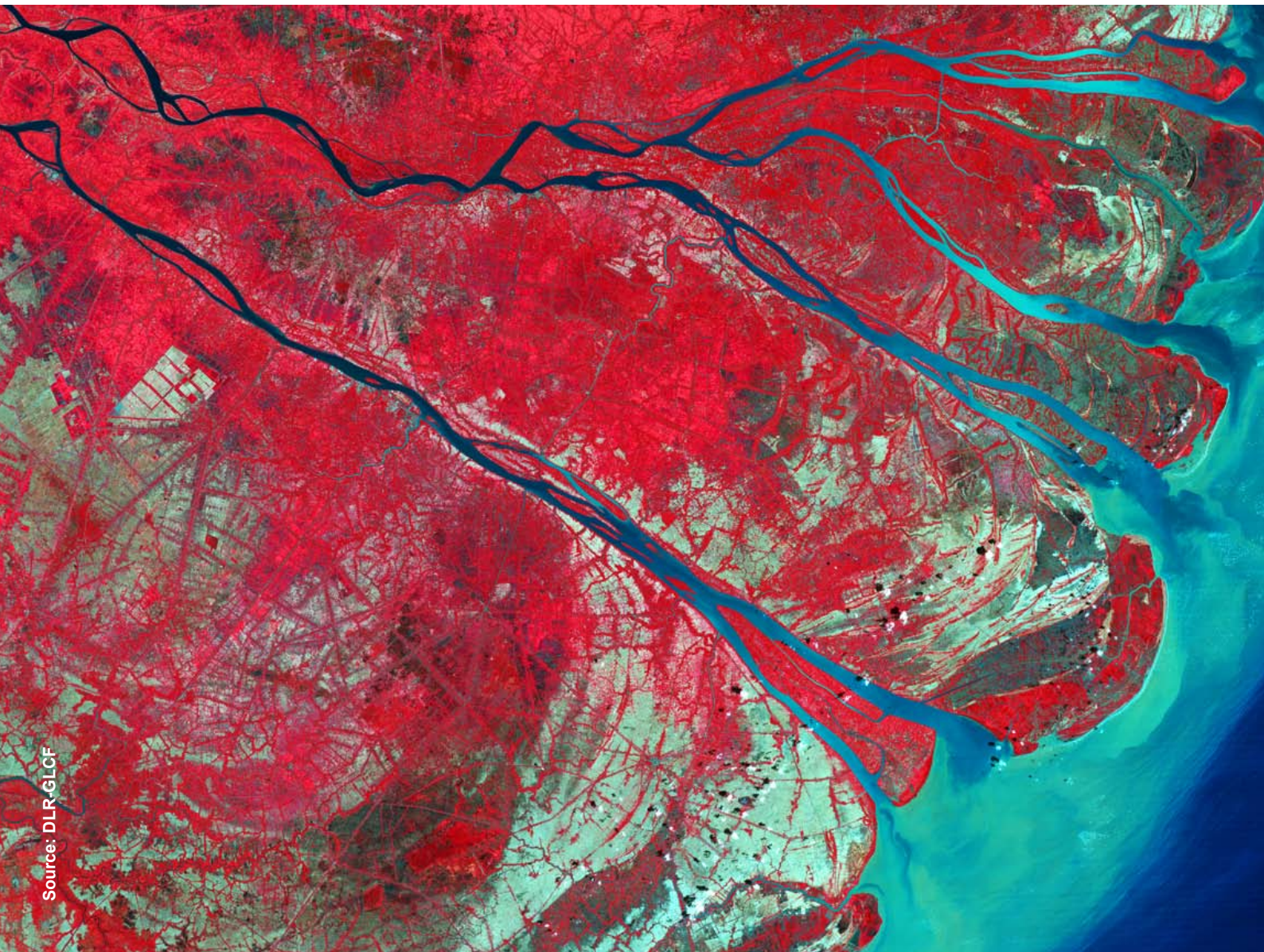
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# Vietnamese-German Scientific-Technological Cooperation in the Field of Water and Environmental Technology

Ministry of Science and Technology of the Socialist Republic of Vietnam (MOST)  
and German Federal Ministry of Education and Research (BMBF)



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**Hanoi, Viet Nam, September 2009**

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## VN-GER Cooperation in the Field of Water and Environmental Technology

The Vietnamese-German cooperation in science and technology was resumed in 1996. Environmental research already was an issue of the first visit of a delegation of the Federal Ministry of Education and Research in Hanoi. The first minutes on cooperation in science, research, and technology between the Ministry of Science and Technology of the Socialist Republic of Vietnam (MOST) and the German Federal Ministry of Education and Research (BMBF) was signed in 1997.

Since then, the bilateral cooperation has developed dynamically, particularly in the field of environmental research and environmental technology. These good relations are based mainly on the many Vietnamese specialists, who completed their studies or vocational training in the former German Democratic Republic. As a result, an unique bridge between Germany and Vietnam was built in the Asian region, associated with a traditional appreciation of German technologies.

Since 2002 bilateral activities of the Ministry of Science and Technology of the Socialist Republic of Vietnam (MOST) and the German Federal Ministry of Education and Research (BMBF) have been increasingly directed to the topic of „Water and Environment“. This partnership is in the strategic interests of both countries. BMBF's international orientation of water research is aimed at contributing to reaching the millennium development goals and at internationalizing water research. Water research in Vietnam shall contribute to reaching the ambitious goals in establishing a sustainable water management.

Both ministries, MOST and BMBF, accounted for the growing significance of the field of water and environment by signing several minutes in the past years. The first minute of the meeting of MOST and BMBF about bilateral cooperation in the field of water and environmental research and technology was signed in October 2005.

It was agreed on the following focuses of research cooperation:

- Sustainable handling of water resources (development, transfer and adaptation of drinking water and waste water technologies, IWRM)
- Remediation of contaminated sites, particularly sustainable development of postmining landscapes
- Sustainable development of urban and rural areas

On the occasion of the 10th anniversary of cooperation in science and technology, MOST and BMBF agreed on the establishment of a joint committee for scientific-technological cooperation. The minute of the inter-ministerial work group of MOST-BMBF was signed in Hanoi 28th of September 2006.



The focuses of the cooperation are:

- Water/environmental research and technology
- Biotechnology
- Research management

In the field of water and environmental research and technology, a strategic partnership “Water” was concluded. The agreement aimed at including economy (particularly technology transfer and adaptation), coordinating the activities with the ministries responsible for infrastructure development, and cooperating with international financing institutions. A bilateral work group “Water and Environmental Technology” was established.

The bilateral work group “Water and Environmental Technology” was ordered to draft a strategy paper. Furthermore, it was agreed to establish a joint office for continuous support of the growing cooperation.

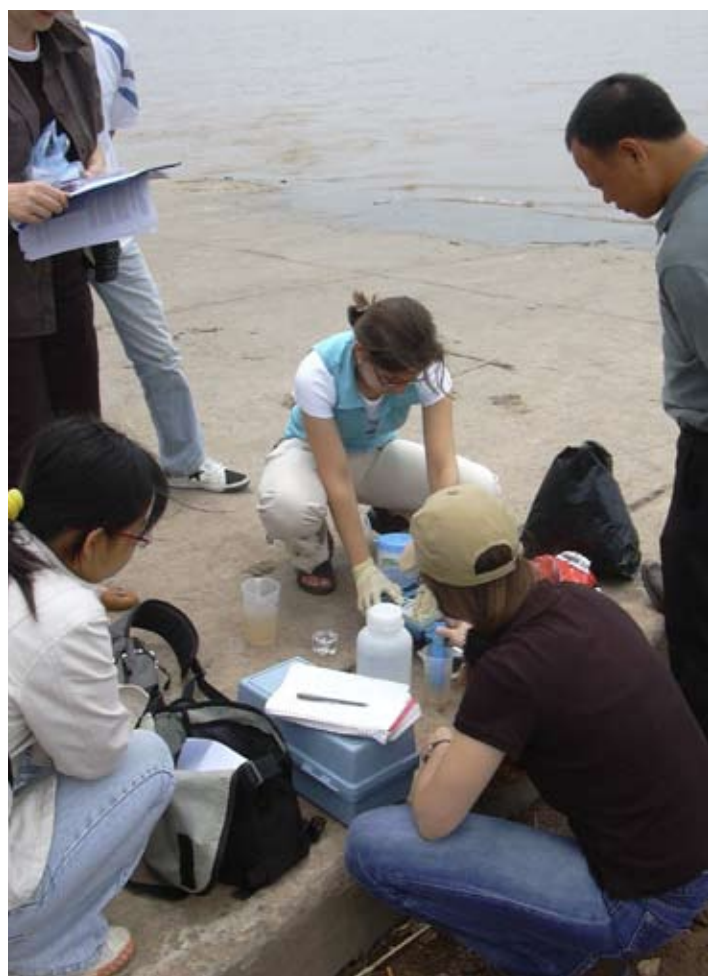
A Strategy paper of the joint water and environmental technology work group was composed on October 3, 2006 in Hanoi according to the actions needed in Vietnam and the knowhow existing in Germany, the strategy paper defined the following priority fields of cooperation relating to water, waste water, and environmental technology:

- Integrated water resources management (IWRM)
- Water technologies for urban and rural areas (drinking water supply, waste water disposal)
- Management of water usage (supply and disposal)
- Industrial waste water treatment and water reuse (industrial parks, handicraft villages)
- Flood forecast and flood protection
- Remediation of contaminated sites (for example, postmining landscapes)
- Further development of environmental legislation, rules, and standards
- Advanced training and qualification

On date 2nd April, 2008 in Berlin in the minutes of the interministerial work group, both sides expressed their satisfaction with the cooperation in the field of water and environmental research and agreed on continuing this successful cooperation.

The result of the various bilateral meetings and discussions are in the following fields:

- Water- and Environmental Technology:  
9 joint projects since 2005, of which one is a sub-project under the joint project IWAS (International Water Research Alliance Saxonia) and 4 individual projects. They are focusing on Water resources management, water information system, supply and disposal (drinking water supply, sewage treatment, industrial waste water treatment / decentralised and semicentralised systems), contaminated sites, lake restoration, sewage treatment in conjunction with artificial recharge.
- Megacities of Tomorrow – energy- and climate-efficient Structures in Urban Growth Centers:  
1 joint project, focusing on urban planning strategies of adaptation to global climate change.



## Vietnamese-German Scientific and Technological Cooperation Office for Water and Environmental Technology (MOST-BMBF)

funded by MOST and BMBF

### Introduction

On the occasion of the 10th anniversary of the scientific cooperation between Ministry of Science and Technology of Vietnam (MOST) and German Federal Ministry of Education and Research (BMBF), the two ministries decided to establish a bilateral work group on water and environmental technology on October 11, 2006.

The main tasks of the bilateral work group are to coordinate and speed up the bilateral cooperation of MOST and BMBF on water and environmental issues. To support the objectives of the bilateral work group as well as the MOST and BMBF, the Office for Water and Environmental Technology was established in Hanoi 27th October, 2007 at 25 Le Thanh Tong street, Hoan Kiem District, Hanoi according to the Decision 2893 of the Minister of the MOST on December 29, 2006.



### Tasks and functions

The VN-GER Office for Water and Environmental Technology

- supports the Ministry of Science and Technology of Vietnam (MOST) and the German Federal Ministry of Education and Research (BMBF) to manage and coordinate projects and tasks of the Vietnamese-German scientific cooperation
- supports the project management agencies of the German Federal Ministry of Education and Research (BMBF) to manage bilateral projects
- supports Vietnamese and German delegations
- supports the Vietnamese-German bilateral work group on water and environmental technology
- provides important and essential information in the field of water and environmental technology for the both sides, Vietnam and Germany
- organizes events and PR on water and environmental technology: training courses, seminars, workshops, scientific conferences, exhibitions, fact finding missions
- is a contact point of MOST and BMBF to the other related ministries: Ministry of Natural Resource and Environment (MONRE), Ministry of Agriculture and Rural Development (MARD), Ministry of Construction (MOC), Ministry of Industry and Trade (MOIT) as well as agencies, institutes and companies

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# Integrated Water Resources Management (IWRM) / Provinces Nam Dinh, Lam Dong and Can Tho

**Duration:** 07.2006 - 12.2010

## Project abstract:

The project is aimed at developing an IWRM concept for an integrated assessment and analysis of water management in river and subriver basins (water demand, water resources, water and land use) and for problem analysis, planning, and decision making.

The project has two project levels:

1. Comprehensive tasks for the development of a planning and decision support system for IWRM (DSS for IWRM) and its application in the provinces of Lam Dong, Can Tho, and Nam Dinh
2. Adaptation of water technologies to the regional conditions (drinking water, sewage, and industrial waste water)

Exemplary technological fields covered:

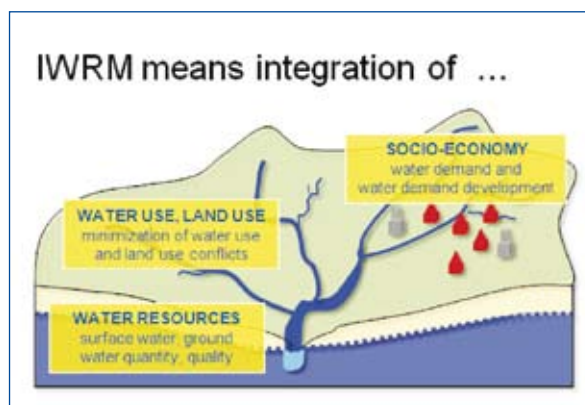
- In the Lam Dong Province in the highlands of Vietnam: Drinking water supply and sewage disposal in rural areas
- In the Lam Dong Province in the north of Vietnam: Treatment of industrial waste water and municipal sewage
- In the Can Tho Province in the south of Vietnam: Monitoring of surface water and reduction of discharges from industrial livestock farming

## Project areas in Vietnam:

Nam Dinh, Lam Dong and Can Tho Province

## German partners:

University of Bochum, University of Bonn, University of Greifswald, Mosquito GIS GmbH, IAKS GmbH, FhG-UMSICHT, DLR-IB



## Vietnamese partners:

Department of Water Resources Management, Southern Institute of Water Resources Research (SIWRR) Department of Natural Resources Environment, Lam Dong (DONRE), Center of Rural Water Supply and Sanitation (CERWASS), Western Highlands Hydraulic Engineering Consultant Construction Co. Ltd. (WHECC), Can Tho University (CTU), College of Technology, Department of Environmental Technology, Department of Natural Resources Environment (DONRE / Provinces Can Tho, Vinh Long, An Giang, Hau Giang, Soc Trang), SoHa State Farm, Nam Dinh: People's Committee Nam Dinh Province, Department of Science and Technology, Nam Dinh, Vietnamese Academy of Science and Technology (VAST): Institute of Geology, Institute of Biotechnology

## Coordination:

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# Water Information System for a Sustainable Development of the Mekong Delta (WISDOM)

**Duration:** 04.2008 - 03.2010

## Project abstract:

Due to a strong population increase, changing climatic conditions and regulatory measures at the upper reaches of the Mekong, the delta is subject to severe changes. Therefore, decision makers, planners and local authorities have to face new challenges. Extreme flood events occur more frequently, drinking water availability is increasingly limited, soils show signs of salinization or acidification, species and complete habitats diminish. All these problems call for an optimized, integrated resource management. For this purpose detailed knowledge and hydrologic, hydraulic, ecologic and sociologic factors must be available. Furthermore, the cooperation of national institutes as well as national, regional and local authorities needs to be strengthened. It is the goal of WISDOM to jointly (Vietnamese and German partners) design and implement an Information System for the Mekong Delta, containing information from the fields of hydrology, sociology, information technology and earth observation. The integration of such data will enable the enduser of the system to perform analyses on very specific questions; and thus will supply the enduser with a tool supporting regional planning activities.



The design of the system puts the focus on the constant integration of available and newly generated data from all different disciplines. This enables useroriented analyses and custom designed querying to develop sustainable solutions in the field of resource management. Possible applications of the system are (1) the monitoring of floods and droughts, (2) evaluation of flood and drought risk, damage potential and actual damages, (3) analyses of water quality, pollution and sediment load, (4) the improvement of flood prediction via remotely sensed precipitation information,

(5) detailed adaptation of surface and subsurface discharge models, (6) information of landcover- and landuse changes, (7) observation of settlement development, surface sealing and population growth.

## Project area in Vietnam:

Can Tho Province, Tam Nong District and Tra Cu District

## German partners:

DLR-DFD - German Aerospace Center - German Remote Sensing Data Center, UNU-EHS - United Nations University, ZEF - Center for Development Research, Bonn, University of Bonn, GFZ - GeoForschungszentrum Potsdam, University of Würzburg, University of Karlsruhe, DHI - DHI Water & Environment, 2Wcom GmbH, Eomap GmbH

## Vietnamese partners:

SIWRR - The Southern Institute of Water Resources Research, VAST-GIRS - Vietnamese Academy of Science and Technology - Division of Remote Sensing and GIS, UIT - University of Information Technology, Sub-NIAPP - Sub-National Institute for Agricultural Planning and Projection, SISS - Southern Institute of Social Sciences, CTU - Can Tho University, The College of Technology and the Mekong Delta Development Institute, SRHMC - Southern Region Hydro-Meteorological Centre, IDR - Institute of Development Economics Research, University of Economics

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# Scientific Fundamentals for the Management of Contaminated Sites in Vietnam (Register of Contaminated Sites in Vietnam)

**Duration:** 03.2005 - 02.2009

## Project abstract:

In Vietnam, former industrialization and today's industrial production have caused contaminated sites. A successful remediation requires a systematic registration of the contaminated sites. It is the aim of the project to develop application oriented scientific fundamentals for the design of a register of contaminated sites. By way of example, two sites are investigated, a pesticide dump and the location of textile industry in the Nam Dinh province.

The main topics of the project are:

- Development of methodological fundamentals and applicable guidelines for the compilation of a contaminated sites register
- Sustainable transfer of the methodological fundamentals of register technology to the administrative level
- Consulting for the development of the legal basis of application of register systems

The project outcomes will be disseminated by guidelines "Management of Contaminated Sites":

- Manual 1: "Fundamentals of the Register of Contaminated Sites"
- Manual 2: "Practical Instructions for Recording Contaminated Sites"
- Manual 3: "Archives: Practical Instructions for Opening up Sources of Information for Contaminated Sites"
- Manual 4: "Fundamentals of Risk Assessment"

## Project area in Vietnam:

Nam Dinh Province

## German partners:

Independent Institute for Environmental Concerns (UfU), Federal Environmental Agency (UBA), International Centre for Soil and Contaminated Sites (ICSS) in UBA, State Office for Environment North Rhine-Westphalia (LANUV), Dr. Mark, Dr. Schewe & Partner GmbH (MSP)

## Vietnamese partners:

Vietnam Environmental Protection Administration (VEPA), Environmental Administration (DONRE) of Nam Dinh Province

## Coordination:

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# Mining and Environment Vietnam (RAME) / Quang Ninh Province

**Duration:** 06.2007 - 12.2010

## Project abstract:

The project on mining and environment in Vietnam is carried out by the Research Association Mining and Environment (RAME) in close cooperation with Vietnam Nation Coal – Mineral Industries Group (VINACOMIN). The main task of the project is to develop and adapt environmental technical and management concepts for the coal mining areas in Quang Ninh Province and to carry out capacity building in the following fields:

- Environmental planning for a sustainable landuse in mining areas
- Environmental management in the coal mines
- Stabilization and recultivation of waste rock dump sites
- Water management in mining areas, especially treatment of different kinds of waste waters caused during the coal production
- Dust monitoring and mitigation in and around the mining areas



## Project area in Vietnam:

Quang Ninh Province

## German partners:

University of Bochum, University of Aachen (RWTH), Helmholtz-Centre for Environmental Research (UFZ), LMBV international GmbH, eta AG, GFI GmbH, Brenk Systemplanung GmbH, BioPlanta GmbH, CBM GmbH

## Vietnamese partners:

VINACOMIN, Vietnam National Coal - Mineral Industries Group, VINACOMIN Information Technology and Environment (VITE), Nui Beo und Van Dang Coal Company, VAST, Institute of Chemistry, and Institute of Environmental Technology



## Coordination:

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# Closing nutrient cycles in Decentralised Water Treatment Systems (SANSED II) / Mekong-Delta

**Duration:** 05.2005 - 07.2009

## Project abstract:

Subjects of the project in the field of sewage are investigations relating to the development of decentralized sewage treatment and the reuse of nutrient-rich and hygienically harmless fertilizers in agriculture and in the field of drinking water studies for the development of decentralized water treatment plants.

The project focuses on:

- Biogas extraction (gas yield and utilization)
- Separation techniques (urine separation) and sewage partial flow treatment (yellow water: Struvite precipitation / black water: Use in a biogas plant or composting)
- Agricultural production (fertilizers / fertilization capacity and hygienic innocuousness)
- Sewage sieving and soil filtration
- Drinking water treatment and supply (surface water and groundwater / sand filtration and disinfection)



## Project area in Vietnam:

Can Tho City

## German partners:

University of Bonn, University of Bochum, gewitra GmbH, Ingenieurbüro für technische Hydrologie und Bodenschutz, BioenergieBeratungBornim GmbH, Sachsen Wasser GmbH, Hans Huber AG, Bioreact GmbH, IBAU, GSan GmbH

## Vietnamese partners:

Can Tho University (CTU), College of Technology und College of Agriculture, Can Tho Water Supply and Sewerage Company (CTWSSC), Center of Rural Water Supply and Environmental Sanitation Can Tho, Environmental Monitoring Station

## Coordination:

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# International Water Research Alliance Saxony (IWAS) – Management of Water Resources in Hydrologically Sensitive World Regions: “Regional Project Vietnam for the Conception of Sewage Treatment in Conjunction with Artificial Recharge”

**Duration:** 08.2008 - 12.2010

## Project abstract:

The internationally oriented project has four superordinate aims:

- Improvement of the transdisciplinary system knowledge of the hydrological cycle, including its adjacent systems (material flow, soil, regional climate, economic water use)
- Development of location adapted technologies for overcoming or mitigating existing water problems
- Development of location adapted water management concepts
- Capacity building

The main objective of IWAS project in Vietnam is development of a sustainable drainage concept based on the existing master plan for the Long Bien district and its integration into existing local water cycle in respect to: supporting further urban development, flood avoidance and minimization, and improvement of the quality of surface and groundwater. The specific objectives of the project include:

- Proposing a sustainable drainage concept adapted to local requirements and circumstances mainly based on new innovative ideas
- Wage system consisting of network, pumping stations and treatment facilities for domestic sewage and for the pretreatment of industrial wastewater
- Conceptual development of a sustainable rain-water drainage system consisting of network, infiltration ponds, canals, open ditches, pumping stations etc.
- Analyzing methods for artificial groundwater replenishment to overcome problems related to lowering of the groundwater level due to over-exploitation of groundwater
- Methods for an environmentally sound sludge treatment and reuse



- Documentation of the results achieved in a handbook describing the conceptual design and supplemented by specific examples of existing solutions
- Human capacity building in the fields of management / maintenance of sewage systems and groundwater replenishment
- Development of guidelines for wastewater management with transferability to similar regions from Vietnam and other South-East Asian countries)

## Project area in Vietnam:

Long Bien district, Hanoi capital.

## German partners:

Technical University of Dresden, Stadtentwässerung Dresden GmbH, Berlinwasser International AG

## Vietnamese partners:

Hanoi Sewerage and Drainage Company (HSDC), Hanoi University of Science (HUS), Duc Minh Consulting Hanoi (DUC)

## Coordination:

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## Treatment of Tapioca Processing Industrial Wastewater and Sustainable Water Pollution Control Management of Key Economic Zones in Southern Vietnam

Duration: 03.2009 - 02.2012

### Project abstract:

The treatment of tapioca wastewater is the main task of the experimental component in the project. A pilot plant will be installed, operated and optimized in a midsize tapioca company in the Tay Ninh province. The wastewater treatment plant consists of an innovative combination of anaerobic and aerobic treatment steps. All schemes will be adapted to and optimized for the specific tropical and environmental conditions of the region.

### Project area in Vietnam:

Tay Ninh Province, Saigon River basin

### Project partners in Germany:

Technical University of Braunschweig, Hochschule Ostwestfalen-Lippe, enviplan Ingenieurgesellschaft mbH, Hager + Elsässer GmbH, Ingenieurbüro Blumenberg

### Project partners in Vietnam:

Institute for Environment and Resources, Vietnam National University of HCMC



At the same time a sophisticated yet robust numerical modelling system will first be developed for the small Tay Ninh basin which contains the pilot plant. The system will consist of interacting modules for the water balance (hydrological model), the transport of pollutants into the rivers and the water quality of the rivers and reservoirs. The model will be highly distributed in time and space and be embedded into a GIS. The model will consider the experimental results enlarged to an operational scale, as well as other treatment plants. The calibrated and optimized model will then be extended to the Saigon river basin upstream of HCMC. The system will consider untreated waste water and treatment facilities of different types at relevant locations. In doing so, the interaction of the measures and the overall impact on the river water quality can be quantified at any location of the river system, and suitable planning variants will be elaborated. This model system will form the basis for a comprehensive and scientifically based pollution management of the whole river basin.

### Coordination:

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## Development of Strategies and Methods for a Sustainable Restoration, Stabilisation and Management of the Hoan Kiem Lake, Hanoi

**Duration:** 10.2007 - 06.2010

### Project abstract:

The Hoan Kiem Lake - lake of the returned sword - is situated in the center of the capital Hanoi and connected with one of the most famous legends from the 15th century. A turtle of the lake handed over a sword to the king Le Thai To. This sword helped the king to gain the victory over invaders. After the victory parade, the turtle retrieved the sword and disappeared in the lake. Due to this relation with Vietnamese history, the lake is of national importance. In addition, it attracts many tourists. As a result of its central location, the lake was exposed to strong pollution. The lake is seriously silted up and water quality decreased.



The project is aimed at the development of the scientific/technical fundamentals for a sustainable restoration and management concept to improve and stabilize the water quality of the Hoan Kiem Lake. Focuses of the project are:

- Characterization of the lake sediments and registration of the sediment distribution by geo electrical exploration and spatial signal allocation
- Determination of the water quality
- Development of a technology for selective and controlled sediment removal
- Dewatering of lake sediments, sediment treatment and utilization
- In situ sediment and water treatment
- Derivation of concepts for the restoration, monitoring, and management of the lake

### Project area in Vietnam:

Hoan Kiem lake, Ha Noi

### German partners:

Technical University of Dresden, HGN Hydrogeologie GmbH, GSan GmbH, Herbst Umwelttechnik GmbH, Ingenieurbüro Dr. Frank Panning

### Vietnamese partners:

People's Committee Hanoi, Department of Science and Technology, Hanoi Sewerage and Drainage Company (HSDC), Vietnamese Academy of Science and Technology (VAST), Institute of Environmental Technology (IET), Hanoi University of Science (HUS), Hanoi University of Mining and Geology (HUMG), Research Center for Geological Environment, Duc Minh Ltd.Co, Vietnam Investment Services GmbH (VIS)



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## Urban.Network HCMC – Integrative Urban and Environmental Planning for Ho Chi Minh City for the Adaptation to Global Climate Change

**Duration:** 07.2008 - 06.2013

### Project abstract:

It is the aim of the project to develop adaptation strategies and planning systems for the climate efficient development of HCMC.

Main objectives of the project:

- Development of strategies for adapting urban development concepts to climate changes
- Implementation of specific aspects of a comprehensive adaptation policy to different spatial levels
- Improvement of the ability of decisionmakers to manage the information relevant to adaptation and to evaluate the range of technological options for adaptation in urban planning and urban design

### The project is divided into two fields of action:

Action field 1:

Urban environment – evaluation of the local impacts of climate change and their special manifestations

Action field 2:

Urban development – development of strategies for adapting urban settlement structures

Action field 1 encompasses four selected fields: Urban flooding, climate, energy and transport. Action field 2 encompasses the work packages: Precaution and adaptation strategies to climate change impacts on regional and city levels, livable city - urban regeneration and community-based adaptation and energy- and climate-efficient housing typologies

### Project area in Vietnam:

Ho Chi Minh city

### German partners:

Brandenburg University of Technology (BTU), Cottbus, Freie Universität Berlin, Braunschweig University of Technology, Darmstadt University of Technology, University of Hamburg, Wien University of Technology, Leibniz Institute of Ecological and Regional Development (IOER) Dresden, The Company for Traffic Engineering, Regionalization and Infrastructure Planning (GRI) Berlin, AG Goedecke und Welsch, Berlin

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