Issue 2
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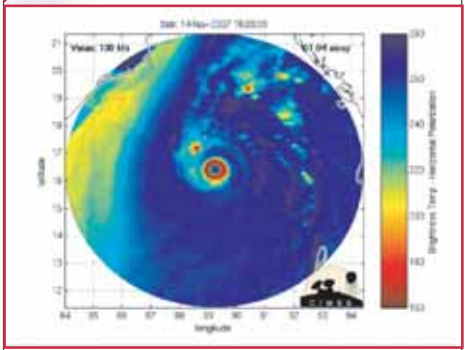


The Cyclone Sidr (see page 5 for details)

the CEGIS NEWSLETTER

Quarterly bulletin of the Center for Environmental and Geographic Information Services (CEGIS)

Inside

CEGIS
Center for Environmental and Geographic Information Services
(A PUBLIC TRUST UNDER THE MINISTRY OF WATER RESOURCES)

House 6, Road 23/C, Gulshan-1, Dhaka-1212, Bangladesh
Phone: 8817648-52, 8821570-1
Fax: 880-2-8855935, 8823128
Email: cegis@cegisbd.com, Web: www.cegisbd.com

Certificate awarded to Planning Commission officials for GIS training

- Ehsan Hafiz

A certificate award ceremony was held on 21 January, 2008 at the NEC auditorium of the Planning Commission. CEGIS provided a number of training to different high-level officials of SICT and the Agriculture Division of the Planning Commission for the project 'Setting up GIS facilities in Agriculture Division of the Planning Commission and e-Government Survey'. It is a sub-project of the Support to Information and Communication Technology (SICT) Program.

The training was given in six major categories on Desktop ArcGIS, ArcView, GPS and advanced training on ArcGIS using Spatial Analyst, 3D Analyst and Image Analyst. The development and maintenance of the GIS database was also part of the training program for GIS database query, tabular data manipulation, editing and data representation.

The photo shows Mr Md Shah Alam, Member, Agriculture, Water Resource and Rural Institution Division handing over the certificate. Also seen in the photo Mr Md Rafiqul Islam, Project Director, SICT Project (extreme left), Mr Muhammad Habibur Rahman, Division Chief, Agriculture Division of the Planning Commission (second from right), and Mr Giasuddin Ahmed Choudhury, Executive Director, CEGIS.

The training aimed at helping the officials of the Agriculture Division learn how to use the Agriculture Resource Information System (ARIS) software in their day-to-day work and thereby enhance their overall performance. It will help them scrutinize projects and facilitate easy sectoral prioritization and allocation through analyzing information in the ARIS.

CEGIS embarks on research project with Vietnam, Cambodia & the UK

- Mominul Haque Sarker

CEGIS is engaged in a research project on 'Sustainable Management of River Bank Erosion along the Mekong River and Gangetic Plain in Bangladesh, Combodia and Vietnam'.

The project comes under the framework of the Partnership of Higher Education (DelPHE) program. The British Council and DFID are funding this three-year project partnered by Vietnam, Cambodia, Bangladesh and the UK. The partner organizations from Bangladesh are the Institute of Water and Flood Management (IWFM) of BUET and CEGIS.

The goal of the project is to ensure cost-effective use of internationally available technology and local knowledge in sustainable development of riverbank protection and zoning policies for rural communities.

The inception meeting of the research project was held in Ho Chi Minh City, Vietnam during 28 January - 30 January 2008. Mr Maminul Haque Sarker, Head of Morphology Division, attended the meeting on behalf of CEGIS.

CEGIS holds training on EIA application to Indian River Linking Project

A four-day long on-the-job training "Environmental Impact Assessment (EIA) Training and its application to the Indian River Linking Project" was held at CEGIS from 17 to 20 February 2008. The training was provided to the officials of WARPO under the project called "Impact Assessment of the proposed Indian River Linking Project for Inter Basin Water Transfer, component 2: Environmental Support". The objective of the training was to transfer knowledge and technical know-how, and share up-to-date data & information on socio-economic and environmental assessment. The training was organized by CEGIS in co-operation with WARPO.

Mr Mohammad Inamul Haque, Director General, WARPO is seen (left) distributing the certificate to a participant

Mr Giasuddin Ahmed Choudhury, Executive Director, CEGIS inaugurated the training program. Mr Mujibul Huq, Environmental Expert; Mr Abu Mohammed Ibrahim, Senior Soil and Agriculture Expert; Mr Md Waji Ullah, Head Water Resources Division, Mr Malik Fida Abdullah Khan, Head Database Division, Mr Sultan Ahmed, Head, Business Development Division and Mr Md Sarfaraz Wahed, Project Leader of IRLP participated as resource persons.

Twelve officials attended the training, eight senior professionals from WARPO and four junior professionals from CEGIS. The topics included *Introduction to the Course, EIA Process - IRLP Context, IRLP Project Description, Baseline Situation of the Water, Land & Agriculture, Fisheries, Ecosystem and Socio Economic Resources, Projection of these Resources till 2050, Water Demand Estimation of these Resources till 2050 and Legal Aspects of IRLP.*

Mr Mohammad Inamul Haque, Director General, WARPO conducted the feedback session. He also distributed certificates among the participants at the closing ceremony on 20 February, 2008. Mr Md Arzel Hossain Khan, Director, Planning, WARPO; Mr Saiful Alam, Project Director of IRLP, WARPO and resource persons from CEGIS were present at the certificate awarding ceremony.

CEGIS at WatSan Expo-2008

CEGIS recently participated in WatSan Expo-2008. The event was organized by WaterAid Bangladesh at the Bangladesh-China Friendship Centre (BCFCC), Dhaka during March 4-5, 2008. The event aimed to create an opportunity for the sector actors to participate and contribute towards the commitments of the International Year of Sanitation 2008 and to enhance sharing of inter-sectoral learning.

The various activities and achievements of the Water Supply and Sanitation Sector of Bangladesh were highlighted at the event through seminars, a rally, WatSan exhibition and cultural shows. The exposition was inaugurated by the Honorable Adviser, Ministry of Local Government, Rural Development and Cooperatives.

Visitors at the CEGIS stall

CEGIS displayed its reports and GIS/RS maps at the stall. At the seminar, CEGIS presented papers on 'Sustainability of WSS and Hygiene Program', 'Water Supply and Sanitation Technologies' and Poverty, Equity and Gender in WSS.

UNSGAB meeting on Water and Disaster

- CEGIS presents Bangladesh report on Cyclone Sidr

Mr Giasuddin Ahmed Choudhury, Executive Director, CEGIS recently attended the second 'High-Level Expert Panel Meeting on Water and Disaster' of the UN Secretary General's Advisory Board (UNSGAB) in Seoul, South Korea. Mr Choudhury presented the Bangladesh report on the Cyclone Sidr at the meeting held during January 28-29, 2008.

Describing the disastrous effects of Sidr, which hit Bangladesh on 09 November 2007, Mr Choudhury presented the government estimation of over 3000 human lives lost along with the fact that more than two million families have been affected by the event. He further presented the impact on different sectors, informing that more than 8.9 million people have been affected in 30 districts that a total damage of around USD 2.3 billion has occurred.

Mr Choudhury however also pointed out that the early warning system put in place by the Bangladesh Meteorological Department (BMD) worked well enough to confine the damage to less than it could have been. As many as 44 thousand volunteers were mobilized to implement a community based warning system and 3 million people were evacuated with more than 1.5 million accommodated in cyclone shelters. Mr Choudhury also presented the details of the responses by the Government, UN agencies, and national and international NGOs who acted swiftly in the recovery phase. He concluded his presentation with the lesson learnt from the recovery phase that called for a comprehensive framework to consolidate localized small scale and targeted activities with the longer-term reconstruction and redevelopment activities.

Dissemination Workshop at CEGIS

A workshop was held at CEGIS on 24 February, 2008 for disseminating study findings on the 'Evaluation of the Performance of Hardware Facilities Installed under the Post Flood Rehabilitation Project' in the Sadar upazila of Sirajganj district and Sundarganj upazila of Gaibandha district. The event was organized by the study team with support from the Social and Economic Division of CEGIS.

Dr. Dilruba Ahmed, Team Leader of the study, presented a 20 minute-long power point presentation on the study methodology, findings and recommendations. A question-answer and discussion session followed which provided comments and issues for incorporation in the Final Report before submission to DPHE.

There were seventeen participants at the workshop. The participants included two professionals from UNICEF, three from DPHE and 12 from CEGIS. The participants were Mr John Richard Johnston, Project Officer, and Mr Kamrul Alam, Project Officer of Water and Environmental Sanitation (WES) Section, UNICEF; Mr S. M Ihteshamul Huq SE, GWC and Project Director, Flood Emergency Response Project (FERP), Mr Sirajul Islam, SE, Dhaka Store Circle, and Mr Sudhir Kumar Ghosh, Executive Engineer, Research and Development and Ground Water Division of DPHE. The participants from CEGIS included Mr Mujibul Huq, Mr Abu Mohammad Ibrahim, Mr Mominul Haque Sarkar, Mr Md Waji Ullah, Mr Sarfaraj Wahed, Ms Iffat Huq, Mr Mollah Md Awlad Hossain, Dr Dilruba Ahmed, Mr Mohhammad Hossen, Mr A T M Shamsul Alam, Mr Subrata Kumar Mondal and Mr Nandan Mukharzee. The workshop was chaired by Mr Mujibul Huq, Team Leader, Social and Environmental Studies.

The participants of the workshop are seen discussing the study findings.

CEGIS was assigned by the Superintending Engineer, DPHE Ground Water Circle to conduct the two-month evaluation study project as a follow-up to the Evaluation of Flood Emergency Response Project awarded by UNICEF in February, 2007. The study project was conducted during 1 November - 31 December, 2007. An Inception Report and the Draft Final Report were submitted to DPHE on 22 November, 2007 and 3 January, 2008 respectively.

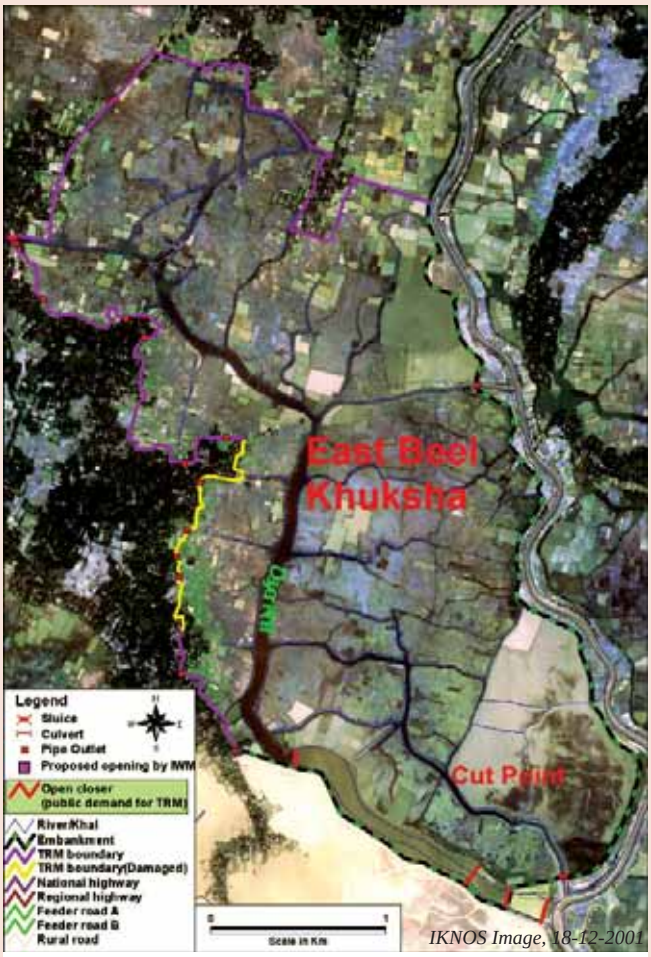
Workshop on compensation mechanism for a TRM basin in KJDRP

A Workshop on "Compensation Mechanism for a Tidal Basin during operation of Tidal River Management (TRM) for Removal of Drainage Congestion from the beels adjacent to Bhabadah area" under Jessore district was held on 11 March, 2008 in the BWDB conferance room, Dhaka.

Mr. Jalaluddin Md. Abdul Hye, Additional Director-General, Planning, BWDB chaired the session. Mr. Md. Habibur Rahman Additional Director-General O & M-II, BWDB was the Chief Guest and Mr. Ghiasuddin Ahmad, Chief Engineer, South-Western Zone, BWDB, Faridpur was present as Special Guest at the workshop.

Mr. Sheikh Nurul Ala, Project Director gave the welcome speech while Mr. Giasuddin Ahmed Choudhury, Executive Director of CEGIS delivered the inaugural speech. The keynote presentation on compensation mechanism for affected stakeholders was made by Mr. Mujibul Huq and Mr. Nityananda Chakravorty of CEGIS.

A total of 60 officials and experts from different government and non-government organizations such as BWDB, WARPO, DAE, DOF, DMB, DOE, LGED, DPHE, IWM, BELA including professionals from a number of ministries such as Ministry of Water Resources, Ministry of Land, Ministry of Law, IMED and Planning Commission, and the study team of CEGIS participated in the



TRM:East Beel Khuksha

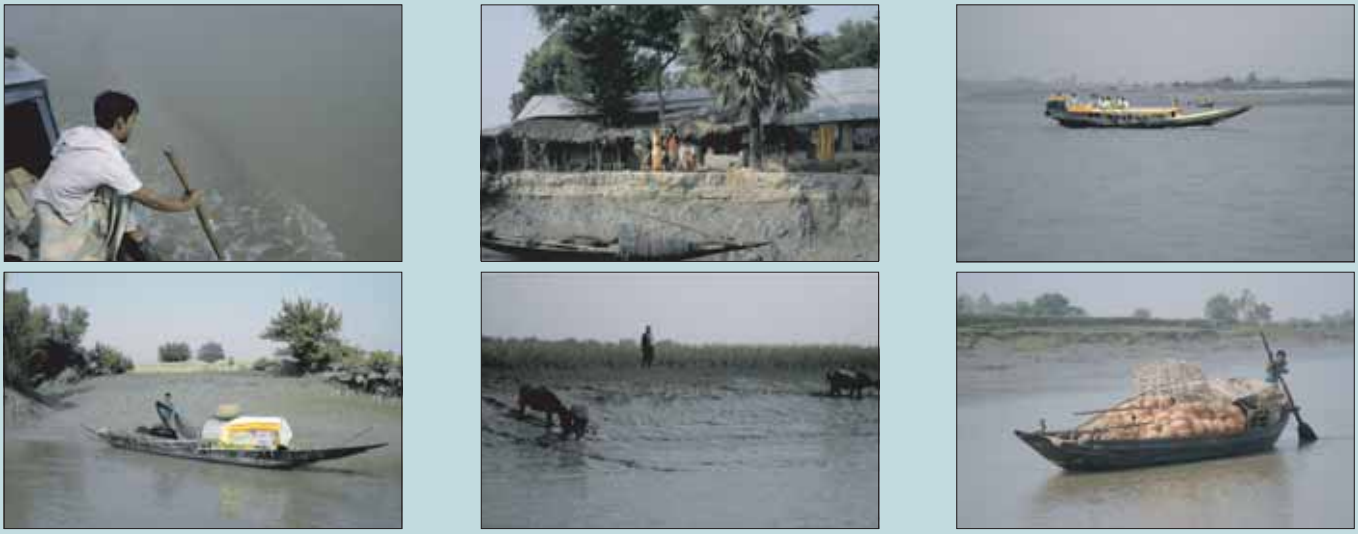
Joint field visit to the southwest river system of Bangladesh

Mr Md Wazi Ullah

On 1st January 2008, CEGIS participated in a joint field visit to the country's southwest region with the Executive Engineer, BWDB, Jessore, UP chairmen, teachers, local elites and members of WMO. The team visited the river reaches from Kharnia Bridge to Bara Aurier Bazaar. The objective of the visit was to see the physical and ecological health condition of the river system of that region. The other objective of the visit was to see the impacts of operating the TRM in Beel Khuksia under KJDRP on the downstream river system. The team checked out the local people's report that the river functionality was gradually improving due to implementation of TRM in East Beel Khuksia.

During the visit the team observed that the depth of the river had increased up to 15 feet during neap tide. The river bank had eroded along Telikhali River with sediment deposited in the downstream of Ghangrail River due to entry of a low volume of tidal water. The team also found that the river had been encroached at many places by local musclemen through construction of shrimp ghers, fish traps (Kuma/Jhail) and sand dumped along the riverbank. This had facilitated the acceleration of river sedimentation. However, water dependent birds, Gangetic dolphins and marine fishes were found to be comparatively more available than in previous years.

The findings of the visit led the team to conclude that conducting regular environmental and hydrological monitoring and ensuring operation of multiple TRM will yield proper functioning of the river system and increase its sustainability.



Some photos (taken during the visit) on river depth, bank erosion, navigation, fisheries, agriculture and silt deposition

CEGIS-WARPO team evaluates EMIN project performance in Daulatpur, Manikganj

Pia Afreena Khaleda Huq

CEGIS in association with RTi, USA developed a GIS based tool to generate flood warning in local language and local context. Using the tool, flood warning was disseminated in parts of Nagarpur and Daulatpur upazila under Tangail district and Manikganj district respectively covering about 266 km_2. The tool was thus used to help the local community reduce flood risk.

Tool development was done under the CFIS and EMIN project with support from USAID, CIDA and partly under a project of WARPO (EMIN). BDPC participated in training the community to understand the implications of the flood warning messages that were sent through SMS, flag, bulletin boards and fax to the community and local administration.

During the 2007 flood, the local people received flood information and were able to reduce damage caused by the event. This was greatly appreciated by the beneficiaries at the local and administrative levels. The EMIN project ended in April 2007 and CFIS will end this year.

Mr Mohammad Inamul Haque, Director General, WARPO and a team from CEGIS recently visited Dualatpur upazila of Manikganj on 26 February 2008, to evaluate the EMIN project performance in risk reduction. The visit of CEGIS-WARPO team to Dulatpur confirms that the community desire for receiving flood warning still remains high in that area.

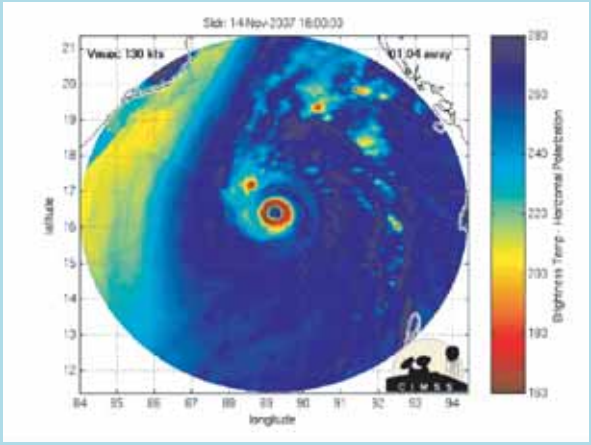
Mr Mohammad Inamul Haque, Director General, WARPO (left) at a briefing during the field trip

The team visited the community during the field trip

The Cyclone Sidr: impacts & some recommended measures

- Syed Ahsanul Haque

The geographical setting of Bangladesh makes it vulnerable to natural disasters. The cyclone 'Sidr' struck Bangladesh on 15 November 2007. It ripped through the southwestern coast with a wind speed of up to 240 km/h (150mph) and a tidal surge of several meters, leaving thousands of people dead and thousands of sq km devastated in its wake. Cyclone Sidr has severely affected all environmental components viz forests, soil, agriculture, livestock, aquatic resources and the overall ecosystem.



The government estimation of the damage has revealed that over 3000 human lives were lost and more than two million families were affected by the event. More than 8.9 million people were affected in 30 districts with over 55 thousand people injured resulting in damage of around USD 2.3 billion. In terms of impact on water and sanitation, around 13 thousand mechanized water sources and another 6000 ponds used as safe water source in coastal areas were affected. The cyclone also severely affected forest resources (around 4 million trees affected and more than 20% of the Sundarbans destroyed/severely damaged), agriculture resources (1 million ha of crop land damaged fully or partially), fisheries resources (inundation, oxygen depletion, salinity intrusion, loss of fish stock etc), livestock resources (1.7 million lost), infrastructure (1.5 million houses damaged in 26 districts, 17 thousand educational institutions fully or partially damaged in 19 districts, 8 thousand km of roads damaged in 11 districts and 1,700 bridges and culverts damaged in 3 districts). The cyclone affected nearly two thousand km of embankment in 15 coastal districts worth USD 70 million and had severe impacts on inland water transport. In terms of its impact on the country's industry, the cyclone caused a national grid failure that led to a countrywide power blackout for several days resulting in considerable loss to industrial production.

In order to be ready to mitigate the effects of future cyclones of similar magnitude, appropriate initiatives are essential. A joint assessment of the damages by the Forest Department (FD), Department of Environment (DoE), Space Research and Remote Sensing Organization (SPARRSO) and CEGIS have led to the following recommendations:

1. Collaborative and comprehensive monitoring and evaluation should be activated at FD;
2. Sustainable alternative livelihood opportunities should be ensured for the poor resource users;
3. Cyclone/surge resilient model village (habitation) should be developed;
4. Fresh water bodies inside and outside the Sundarbans should be restored;
5. Awareness program should implemented;
6. Indigenous fish fry release program should be undertaken in open water fish habitats;
7. Capacity enhancement of FD (rehabilitation of damaged infrastructure and facilities) should be undertaken;
8. Green belt program should be initiated;
9. Sustainable land zoning/management program should be established;
10. Marine, estuarine and riverine protected areas should be established;
11. Ban on shrimp post larvae collection by harmful nets such as Fixed Bag Net, Current Jal and others should be banned.

Affected homestead vegetation

Collapsed house

CEGIS installs GIS facilities at the Planning Commission

CEGIS has recently completed the task of setting up GIS facilities at the Agriculture, Water Resources & Rural Institution Division of the Planning Commission. The Agriculture Division deals with the country's planning and policy issues of the agriculture, water resources and rural development sectors. The project was undertaken for internal capacity building as well as to accelerate the decision making process for fulfilling the immediate and long term objectives of the three sectors.

The overall objective of the project "Setting up GIS Facilities in Agriculture Division of Planning Commission" was to computerize and accelerate the process of integrated decision making by setting up a cutting edge technological information base using GIS and a geo-spatial database system. The tasks performed to fulfill the project objective were i) Development of a GIS-based web application software; ii) Pertinent classroom training for planners; and iii) A well-furnished GIS Lab.

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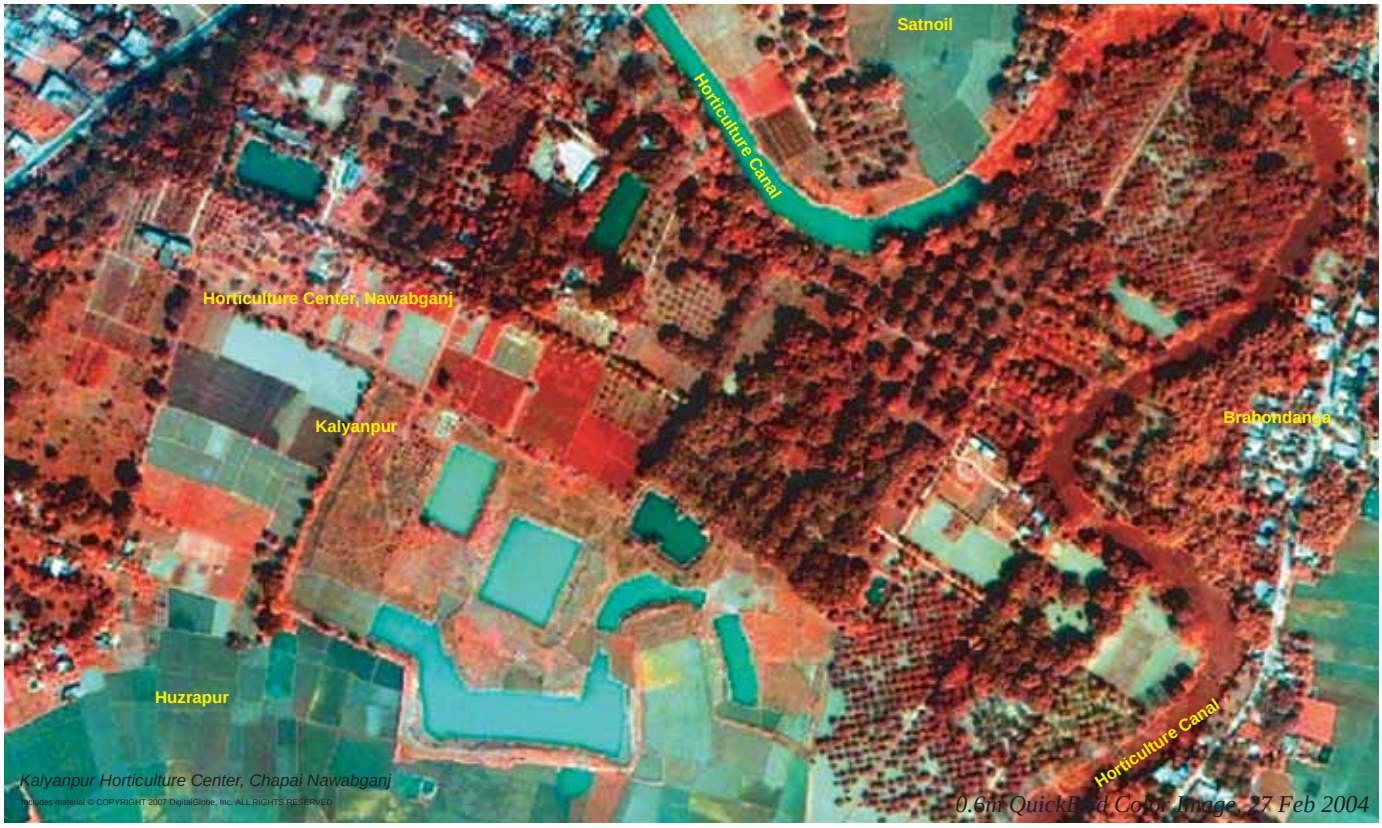
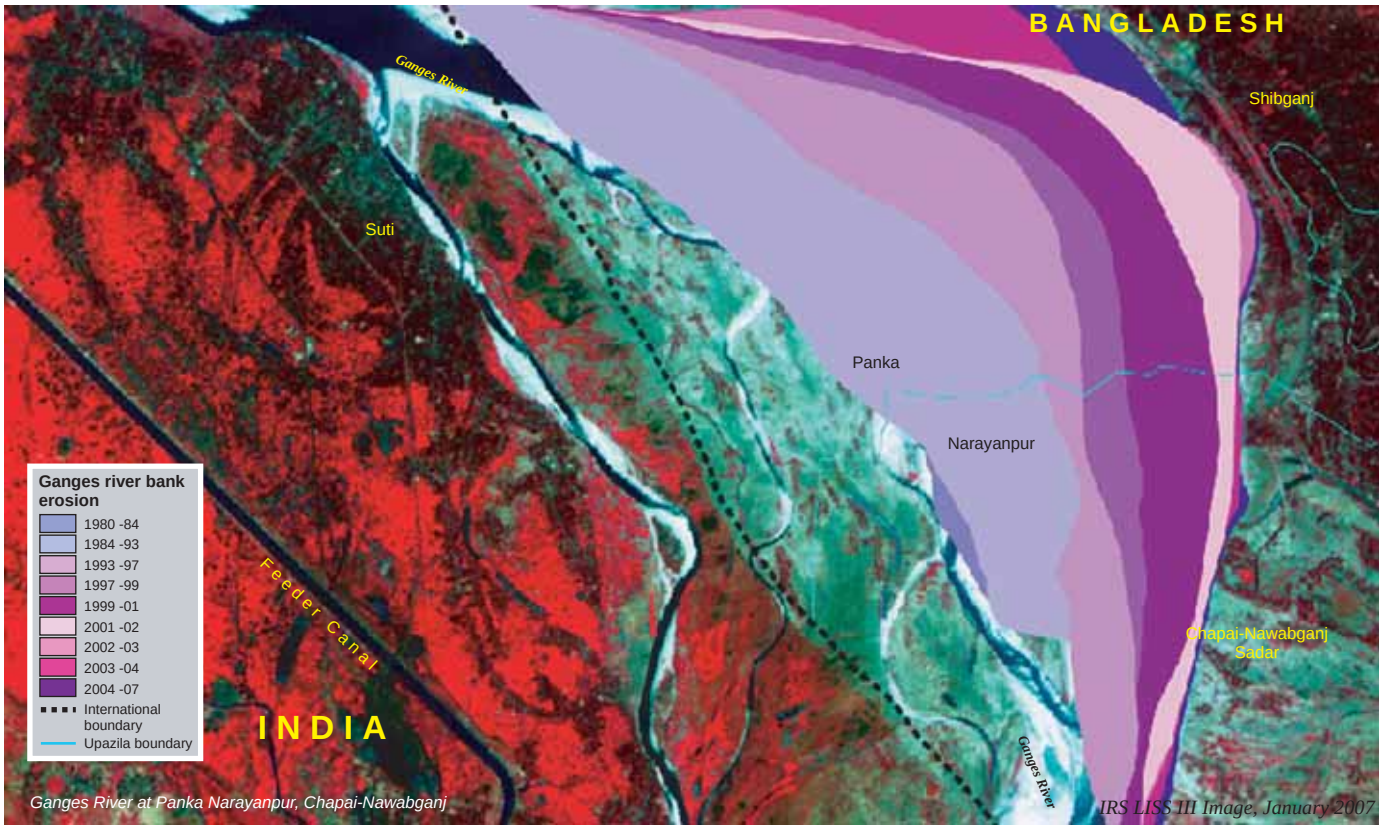
Satellite images processed by CEGIS



Map of Mango Orchard: Mangoes grow widely all over Bangladesh especially in the northern districts and there are innumerable varieties. Chapai-Nawabganj, the hotbed of mango production in the country is highly suitable for large mango orchards. The Kalyanpur Horticulture Center in Chapai-Nawabganj, working under the Department of Agricultural Extension, is engaged in various agricultural and fruit research works including mango research. Mango trees of different species of local and hybrid variety at different stages of growth in the Horticulture Center are seen in the high resolution QuickBird satellite image above.



Erosion Monitoring: Remote Sensing technology is used to monitor bank erosion of the Ganges, Padma, and Jamuna rivers. In the early 1980s an active meandering bend on the left bank of the Ganges River at Shibganj and Chapai-Nawabganj Sadar upazilas near the border with India, started eroding at a very high rate. So far approximately 10,000 ha of land has been eroded at this bend. This includes a vast area of mango orchard in Nawabganj district.

GIS-based Application Software

A GIS-based web portal called the Agriculture Resource Information System (ARIS) has been developed under the project. Its major components include a GIS based Project Information Management System, a web-based customized GIS application software, and a Metadata System.

GIS based Project Information Management System (PIMS): This system has been developed to explore project details (using spatial and non-spatial queries) for facilitating project-planning exercises. It consists of two modules: PIMS Viewer and PIMS Editor. The web based PIMS Viewer provides facilities to view, query and generate project reports, while the PIMS Editor's job is to edit and update information.

Web-based customized GIS application software: This software has been developed to plan, evaluate and monitor the projects undertaken by the Agriculture Division. Separate modules of the software were developed for each of the five wings of the Agricultural Division based on the different functions of each wing.

Each module has been designed not only to perform the necessary analysis but also to act as a key to GIS based decision support for respective tasks.

Metadata System: Metadata is "data about data" and it is the background information that describes the content, quality, condition, and other appropriate characteristics of data. A web-based customized metadata model has been developed following the international (ISO) and national standard set up by the National Water Resources Database (NWRD).

Training –Technology Transfer

Training for capacity building was one of the most important assignments under the project. Around 40 officials were trained during the project period for knowledge dissemination as well as technology transfer. The following types of training were provided:

Project launching ceremony

- Entry-level training in Desktop ArcGIS
- Advanced level training in ArcView
- Advanced level training in ArcGIS with Spatial Analyst, 3D Analyst, Image Analyst,
- GPS training
- Entry-level training in Desktop ArcView and Customized Application Software
- Training in development and maintenance of GIS Database

Setting up GIS Lab

A GIS Lab has been set up at the Agriculture Division furnished with hardware e.g. a server, 4 workstations, UPS, a scanner, printers, GPS, a digital camera and furniture. While installing the lab, software support was provided through Oracle 10g and ArcGIS 9.2 software with extensions. A local Area Network (LAN) has also been established at the GIS lab.

(News source: Database & IT Division)

Arsenic mitigation in Bangladesh: National screening data and case studies in three upazilas

Since 2000, Bangladesh has conducted one of the largest water quality screenings ever made. On the basis of national random surveys made in the late 1990s by the British Geological Survey and the Department of Public Health Engineering, geological units prone to arsenic contamination were identified. Two hundred and seventy upazilas within these geological units were then identified and selected for blanket screening: testing of every single well. Over 5 million wells have been tested to date during which the testers provided information about arsenic to tubewell owners and painted the wells red (for above the permissible limit of 50 parts per billion) or green (for within the limit) as per the test results. Well testers also recorded basic demographic information, which is recorded in the national database.

The massive dataset of field test kit results (of 2006) maintained by the National Arsenic Mitigation Information Centre (NAMIC) indicates that the nationwide prevalence of arsenic above 50 ppb in tubewells is approximately 20%, which is significantly less than reported in 2001. The data show that some 20 million Bangladeshis have ready access to a contaminated well and as such are at risk of arsenic exposure. Many of these people at risk have switched their water source following the tubewell screening, and are now taking water from a more distant, safe water point. Re-sinking of red tubewells has also significantly lowered the risk of exposure for this population.

After several years of intensive mitigation in three arsenic-affected upazilas (Bhanga of Faridpur district, Muradnagar of Comilla district, and Serajdikhan of Munshiganj district), awareness is high but water-seeking behaviour, as evidenced by spot checks of household water quality, is only changed where there are large numbers of green tubewells, where red tubewells can be resunk to a deeper

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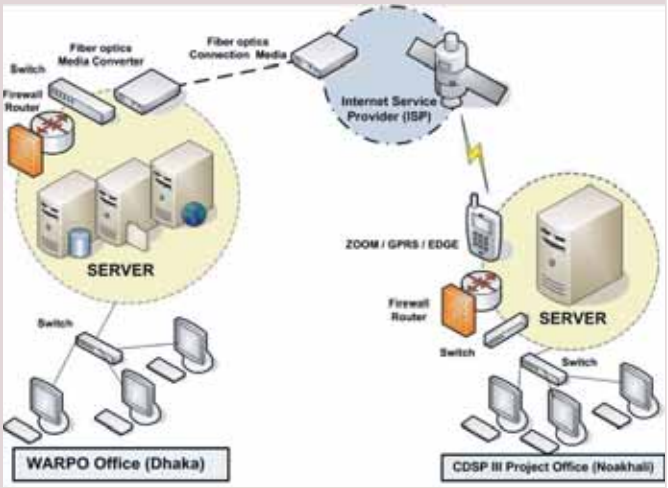
layer, or where deep tubewells are being installed. In these upazilas, significant differences in tubewell water quality were found between the 2001 and 2005 surveys, with significantly fewer tubewells in the second survey found to exceed the national standard of 50 ppb. These differences highlight the importance of repeated testing, especially of tubewells having moderate contamination (10-100 ppb). These upazilas represent only a small portion of the arsenic-affected areas in Bangladesh, but the experience here may be extrapolated to other areas.

Brief summary of the paper by Richard B. Johnston, UNICEF Bangladesh and Motaleb H Sarker, CEGIS, published in the Journal of Environmental Science and Health, Part A, Volume 42, Issue 12, October 2007. The paper analyzes and summaries data from the NAMIC dataset and presents case studies of arsenic mitigation in three highly affected upazilas.

Development & implementation of inter-office connectivity between CDSP-III and WARPO

As part of the continuing cooperation with WARPO and BWDB, CEGIS has recently worked for establishing inter-office connectivity between WARPO and CDSP-III (Noakhali). The aim was to keep all CDSP database and information up-to-date using ICRD database developed under ICZMP project of WARPO. CDSP III is the third phase of a project that has been implemented since 1994 under the Ministry of Water Resources. The overall objective of this project was poverty reduction through socio-economic development in the coastal areas of southeastern Bangladesh.

CEGIS has configured one of the database servers of WARPO and registered it as a web server to establish online connectivity between WARPO and the CDSP-III Noakhali office. Online connectivity has been provided through broadband Internet connection and some special security devices (e.g. Firewall Router, Network Switch, etc) have been installed at WARPO to prevent unauthorized access from outside. Other than this, a Web portal for accessing ICRD database has been furnished with various interfaces to share, view and download information based on the data sharing protocol signed between CDSP III and WARPO. The server at WARPO has been configured in such a way that only the server of CDSP-III Noakhali office can access the web server.



WARPO-CDSP III Connectivity Diagram


CDSP III Project office (Noakhali)

In the CDSP III Noakhali office, the same types of security devices (e.g. Firewall Router, Network Switch etc) and technologies have been introduced. These servers can connect through EDGE/GPRS/ZOOM modem to access WARPO's web portal and can view different information from the databases. Authorized personnel from CDSP III Noakhali office using a secured user ID and password provided by WARPO can also download different layers of data from the approved data list.

(News source: Database & IT Division)