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Network for
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In this Issue

Interview: Professor Amanat Ullah Khan	2
ICT in Disaster Management -Dr. Shakil Akther	2
Information and Communication Technology for Development (ICT4D) -A.H.M Bozlur Rahman	4
Earthquake Vulnerable Atlas : Am Attempt in Chittagong City -Dr. M. Shahidul Islam	5
Climate Change Modeling in Disaster Risk Management -Dr. A.K.M. Saiful Islam	6
Role of ICT in flood risk reduction through community empowerment -Moloy Chaki	7
River bank erosion prediction tools CEGIS -Nazneen Akter	8
Strategic Use of ICTs for Poverty Reduction -Rafiqul Alam	9
ICT, Digital Divide, and Disaster Risk Management in Bangladesh -PInr. Kazi Shahidur Rahman -Mokter Hossain -Sabkat kamal	10

EDITORIAL

ICT in Disaster Risk Reduction

Looking at the events of the last few years Natural Disasters and massive destruction to the lives and livelihoods it is evident that by no means natural or man made disasters can be fully reduced. Only the loss caused by these events can be prevented. Information and Communication Technology (ICT) can be used to minimize the impact and advance human development goals. Like all new and old technologies that are not just incremental but revolutionary in their impact, the spread of information and communications technology (ICT) has a mixed response. The fears of digital divide if not rightly expressed in the prospect of using this technology for effective disaster management is a burning question. However, the realization of development gains from ICT requires the rather widespread diffusion of the technology through a vertical, multi-level process that delivers access to the technology to disadvantaged communities and individuals.

With advancement in Information & Communication Technology in the form of Internet, GIS, Remote Sensing, Satellite-based communication links; it can help a great deal in planning and implementation of Disaster Risk Reduction measures. These technologies have been playing a major role in designing early warning systems, catalyzing the process of preparedness, response and mitigation. ICT tools are also being widely used to build knowledge warehouses using internet and data warehousing techniques. These knowledge warehouses can facilitate planning & policy decisions for preparedness, response, recovery and mitigation at all levels. Similarly, GIS-based systems improve the quality of analysis of hazard vulnerability and capacity assessments, guide development planning and assist planners in the selection of mitigation measures. Communication systems have also become indispensable for providing emergency communication and timely relief and response measures.

Considering the overall perspective and the pitfalls and importance of ICT, NIRAPAD decided to cover ICT and Disaster Risk Reduction in this issue. It presents several articles, expert opinion, a case study, brief summary of an ICT project, and the digital divide. We hope our publication will be succeeded if it can contribute in generating further knowledge and meeting up the gap between reached to and unreached people. I would like to acknowledge authors, our colleagues, and member NGOs for their contribution.

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Interview 

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1. Why have you become interested in GIS?

Geographical Information System (GIS) is a tool for a modern geographer. GIS technology has successfully computerized and automated the map making procedures. As you are aware a geographer uses maps to express his views about the world and its environment. GIS technology has enabled the modern geographers to deal with enormous quantities of spatial data, understand large scale environmental processes as well as conduct advanced spatial analyses including environmental modeling.

2. How fruitful is GIS in ICT?

As a discipline, GIS technology actually represents the high-end of what is known as ICT. All over the world government departments and agencies are acquiring this technology to get the advantage of enhanced decision-making capability. It has become equally popular to the International Agencies and Multinational Corporations. The technology has found its place in environmental monitoring, climate change study, natural resource appraisal and monitoring, environmental health, energy resources monitoring, natural disaster management and monitoring etc.

3. Which disaster phase can we use GIS and the importance of ICT/GIS in Disaster Management?

GIS can be part at all stages in natural disaster management and

mitigation and the analyses and modeling of the same to attempt at predictions of disaster occurrences. During disasters the GIS data will help monitor the area and the population that are vulnerable to incoming disaster. Once the disaster is over the database helps in damage assessment and provide insights into decisions about recovery and rehabilitation efforts. ICT/GIS is very important as it enables very quick assessment of the disaster situation so that the responses can be swifter.

4. How can this be coordinated in ICT?

The Centre for Environment and GIS (CEGIS), Local Government and Engineering Department (LGED), Institute of Water Modeling (IWM), Water Development Board, Survey of Bangladesh (SOB), and the various Universities are some spatial data producing organizations. The spatial data that are being produced by different organizations are of different level of quality and accuracy as no standard found. I would suggest the main map and spatial data producing organization of the country the Survey of Bangladesh (SOB) should take the initiative to standardize the spatial data producing framework.

5. Do we need any separate ministry for ICT?

No. For coordinating the activities of the GIS and RS personnel using an organization called Bangladesh Society of Geoinformatics (BSGI). The BSGI intends to take up the coordination and standardization activities in this field. At present the Comprehensive Disaster Management Project (CDMP) has been implementing a project to coordinate the GIS database activities. BSGI is contributing to this project

6. What are your future plans?

To continue to pursue the technology, teaching, developing courses in advanced and analytical GIS at the University. May be try to set up a separate fully fledged Department at the Faculty of Earth and Environmental Science at the University of Dhaka.

ICT in Disaster Management

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Disaster management is an imperfect science. It is impossible to predict accurately when and where a disaster will occur. It can cause massive destruction to the lives and livelihoods of large population and hence, to the national economies. It is experienced that the least developed and developing

countries are impacted more severely by large scale natural disasters. The consequences of natural and man-made disasters and the vulnerabilities to which populations are exposed can be mitigated if they are targeted pro actively. Though one must always remember that it is not always possible to completely eliminate a risk, extensive experience and practice in the past few decades have demonstrated that the damage caused by any disaster can be minimized largely by careful planning, mitigation and prompt action. With

advancement in Information & Communication Technology in the form of Internet, GIS, Remote Sensing, satellite-based communication links; it can help a great deal in planning and implementation of disaster risk reduction measures. These technologies have been playing a major role in designing early warning systems, catalyzing the process of preparedness, response and mitigation.

The disaster management cycle involves four key phases:

▪ Mitigation	▪ Preparedness
▪ Response	▪ Recovery

These four phases usually overlap. ICT is being used in all the phases, but the usage is more apparent in some phases than in the others. However the new paradigm put more emphasis on pre-disaster (i.e. preparation) than post-disaster (i.e. recovery). The first important steps towards reducing disaster impact are to correctly analyse the potential risk and identify measures that can prevent, mitigate or prepare for emergencies. ICT can play a significant role in highlighting risk areas, vulnerabilities and potentially affected populations by producing geographically referenced analysis through, for example, a geographic information system (GIS). By utilizing a GIS, agencies involved in the response can share information through databases on computer-generated maps in one location. Without this capability, disaster management workers have to access a number of department managers, their unique maps and their unique data. Most disasters do not allow time to gather these resources. GIS thus provides a mechanism to centralize and visually display critical information during an emergency. There is an obvious advantage to using a map with remote sensing or GIS inputs instead of a static geographical map. A static map is mostly analogous and is not interactive. On the other hand, a vulnerability map with GIS input provides dynamic information with cause and effect relationship. GIS and Remote Sensing is widely used for disaster management.

▪ Planning	▪ Mitigation
▪ Preparedness	▪ Recovery

The importance of timely disaster warning in mitigating negative impacts can never be underestimated. There are many new communication technologies that allow warning providers not only to reach the people at risk but also to personalize their warning message to a particular situation. Opportunities are available right now to significantly reduce loss of life and potential economic hardship if disaster warning systems can be improved. It is important to note that disaster warning is indeed a system, not a singular technology, constituting the identification, detection and risk assessment of the hazard, the accurate identification of the vulnerability of a population at risk, and finally, the communication of information about the threat to the vulnerable population in sufficient time and clarity so that they can take action to avert negative consequences. This

final component underscores the importance of education and creating awareness in the population so that they may respond with the appropriate actions. Both traditional and new – that can be effectively used for disaster warning purposes. Some may be more effective than the rest, depending on the nature of the disaster, the regions affected, the socio-economic status of the affected communities and their political architecture. However, it is not a question of one medium against another. All are means to a common goal of passing along disaster warnings as quickly and as accurately as possible. Some of the major media that can be used for early warnings are

▪ Sirens	▪ Short Messaging System
▪ Radio	▪ Fixed and Cellular Phone
▪ Television	▪ Internet
▪ Satellite, Amateur and Community Radio	

The most difficult period of a disaster is the immediate aftermath. This period calls for prompt action within an exceptionally short period of time. In the aftermath of any disaster, a significant number of individuals will be injured and/or displaced. Many of them may still be living with the trauma they have encountered, including loss of loved ones. Affected individuals may also be without food or other essential items. They might be waiting in temporary shelters, with no idea what to do next. Some might need immediate medical attention, while the disaster aftermath environment also creates ideal breeding grounds for possible epidemics. To tackle this Information Technology is widely use. Some of the major uses of ICT in post-disaster management are

▪ Tracing missing person	▪ Co-ordinating different agencies involve in disaster management
▪ Planning and locating different temporary shelters	

While the role of ICT in the long-term disaster recovery process is not as apparent as it is in disaster warning, there is no doubt that ICT is being used widely to disaster recovery. ICT tools are being used to gather, store and analyse data related to disasters, not only in post-disaster conditions, but also as a long-term measure to mitigate the risk of the disasters.

The challenge is to determine the role of ICT in addressing priorities in disaster management. It should be bear in mind that ICT is only a tool and it should not be treated as a panacea for all issues arising in disaster management. As is the case with any other tool, the effectiveness of ICT in reducing disaster risk depends on how it is used. The use of ICT for disaster management should not be a choice between these medium technologies against that medium/technology. The very reason for the existence of so many channels is that none of them is suitable for every situation. One medium that might fit best under a certain set of circumstances might be of little use under another. Thus, what is require is not a competition between different media and technologies, but instead, using the best combination depending upon the circumstances.

Information and Communication Technology for Development (ICT4D) - Role of Amateur Radio in Developing Communication

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1. Now a days the world is differentiated in two groups. One part receiving technological advantage and another is deprived of updated technology. At present those who are deprived of any ways of such information and technology are moving backward. Recently use of advanced information and technology is playing an important role in poverty reduction. Therefore it is big challenge for us to establish Information and Communication Technology as human right.
2. One of the renowned ways of ICT is amateur radio or Ham radio. Amateur radio is a hobby of science. All Ham's receive government license through Radio transceiver and maintain contact with worldwide Ham. At any national disaster, emergency treatment or other public service Ham's play an important role. Especially when normal telephone, mobile, satellite communication is disrupted, amateur radio holders set substitute communication system as volunteer. Developing country like Bangladesh can play an important role in establishing amateur radio as part of improved Information and communication technology because;
 - By introducing amateur radio, a good number of Information Communication expert and manpower can be built without any extra cost.
 - Amateur Radio holder can utilize electronic and modern communication skill for poverty reduction and other works of public importance.
 - Amateur Radio holder can provide lends a hand of public interest at minimum time, those not possible by government to provide such information in smallest possible time.
 - The skill, knowledge and experience of Amateur Radio holder can help people to be self dependent and motivated.
3. In 1992 first approve to introduce Amateur Radio service in Bangladesh. Ministry of Postal and Telecommunication act as the focal ministry for Amateur Radio through T&T board. T&T examining the first grade give license through general grade that means, High Frequency (HF). At present there are at least 60-70 license holders in Bangladesh, comparing Japan of 1350127, Australia 22965 and India 15000 Amateur Radio holders. T&T board without any notification stopped the transmission of Amateur Radio. It is to be mentioned that BNNRC motivated T&T to introduce Amateur Radio.
4. In developing communication Amateur Radio can play an important role. Especially during disaster periods it can work as substitute communication system in 16 coastal districts. Recently BNNRCs has established radio network as substitute ways in Dhaka-Chittagong, Dhaka- Cox's bazaar, Dhaka- Barishal, Dhaka-Bhola.
5. Cyclone, tidal surge, earthquake, tornado etc. are natural hazards but if Amateur Radio is installed it can assist in measuring damage, reducing damage and public protection to people.
6. Constraint and way out to Amateur Radio are;
 - Amateur radio is renowned in whole world as Information and Communication technology. More over Government announced Information and Communication Act 3.2.7 illustrates, use of information and communication technology and availability should be in terms of people's welfare.
 - Also it is not used in commercial basis and Amateur Radio Holder work voluntarily, the all direct and indirect tax should be reduced to 5%.
7. Bangladesh is a disaster prone area. At any Disaster situation Amateur Radio can play a major role. Amateur radio should be introduced to the people and as an important means of information and communication can help to reduce poverty. All the constraints concerning transmission should be removed to introduce Bangladesh to the entire world.

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Earthquake Vulnerable Atlas : An Attempt in Chittagong City

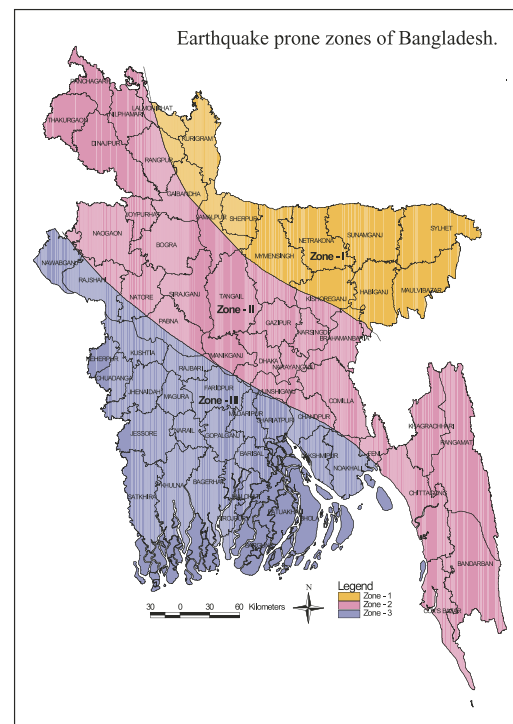
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Bangladesh is considered to be most disaster prone nation of the world. Except volcanic eruption and snowfall, Bangladesh witnesses the experiences of nearly all major disasters. Bangladesh is vulnerable to earthquake disaster because of two major reasons: one is its geographical location and other is the socio-cultural setting. Off-course geographically Bangladesh is not as much vulnerable as many other countries, such as Japan, Indonesia, the Philippines, USA and other. Physical vulnerability largely depends on the location of the country from major geological activities, mostly tectonic activities, and such activities are predominated along the major plate boundaries of the earth. Bangladesh is not exactly located on the plate boundary, but not far from the Indian-Eurasian subduction zone (plate boundary). There is thus always a threat of moderate to strong earthquake tremors along this belt and the hilly areas of the country, particularly Chittagong and Sylhet region is geologically more vulnerable. Bangladesh is mostly vulnerable to earthquake disaster because of its poor and unplanned infrastructure and very complicated and indiscipline socio-cultural behavior. It is a very densely populated county and in urban areas population density is so high and buildings are so poor that even a medium intensity earthquake may cause huge death tolls. Particularly Dhaka and Chittagong city is the death trap for earthquake disaster. If these cities are hit by a strong earthquake of magnitude more than RS-6, there would be a huge death tolls, may be million; many fold higher than 1970 or 1991 cyclone disaster. Does Bangladesh want to be the witness of such mass graveyard? Like many other disaster earthquake disaster is also manageable. Japan is an example to manage earthquake of any magnitude. The management of earthquake disaster requires both hardware engineering solution as well as management of software socio-cultural behavior. Bangladesh needs to address both the solutions simultaneously, but may be under short-, mid- and long-term plan. Earthquake vulnerability Atlas is a tool to be used in earthquake disaster management. But we need to know what is an earthquake vulnerability Atlas? Earthquake Vulnerability Atlas (EVA) is a compilation of series of map to show the level of vulnerability of any part of the country, region or city based on certain criteria, say physical or social conditions. It is not a new concept and has been used in many countries, including Japan. However, after the Barkol earthquake it was initiated by the author to prepare the earthquake vulnerability Atlas for Chittagong city area. ActionAid Bangladesh, with financial support from DIPECHO comes forward to support him.

The work has been done in three phases. In the initial phase a grid based survey was conducted throughout the city to collect major physical and socio-cultural information. The data was analysed using GIS platform and finally the EVA was prepared to locate spatial earthquake vulnerability of the city. In the second phase of the survey high resolution plot-to-plot information of 23 selected wards were collected and a very detail vulnerability mapping was made. The third and final phase, which just has been completed, included all the major life-lines, such as gas, electricity, water supply system of the city and shows how these life-lines are linked to the vulnerability assessment of the city.

The Atlas so far been prepared to assess earthquake vulnerability of Chittagong city has been disseminated among the stakeholders, including at policy level in Dhaka. It has created a sensation and motivation about the need for such earthquake vulnerability Atlas among stakeholders. Government as well as many NGOs has expressed their interest to continue such mapping activities in other major cities, including Dhaka city. Bangladesh has succeeded to manage cyclone disaster, but before that the country had to witness thousand of dead bodies. We do not have time to spare and wait for dead bodies from earthquake, but immediate need to take necessary measure to manage earthquake disaster, before we count mass dead bodies. It could be any one at any time approaching toward the grave. Among many other options, earthquake vulnerability Atlas could be one of tools that can be used to stop our such a tragic journey.



Source: NWMP

Climate Change Modeling in Disaster Risk Management

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Variability and change of climate will certainly affect on disaster preparedness and management. Bangladesh is a country vulnerable to many kinds of natural disaster such as floods, cyclones, river erosion and drought etc. It is evident from the forth assessment report of Intergovernmental Panel of Climate Change (IPCC) that the magnitude and frequency of some of these natural disasters will be enhanced in future. The occurrences and magnitude of cyclones will be increased in future. On the 15th of November 2007, a category four Cyclone "SIDR" hit Bangladesh which killed around 3500 people, destroyed trees and vegetations, damaged houses and road networks and polluted ponds and other fresh water bodies. Cyclone SIDR exhibited unusual characteristics by traveling wide and long area inside the country. In future, there will be many changes in the natural disasters due to climate change. In order to enhance our preparedness for future disasters, it is also required to predict future changes in the climate system.

Climate change modeling can help to predict future climate using various possible future scenarios. Climate change models are nothing but solving a sets of mathematical equations which describes the interactions of the atmosphere, oceans, land surface, and ice. More than twenty famous organizations have developed their own climate change models. Some of the famous General Circulation Models (GCM) are HADCM3 developed by the Hadley Center of UK, NCAR-PCM by the NASA of USA, and MRI-CGCM by Japan etc. Climate change models can predict many environmental parameters such as temperature, rainfall, wind speed and atmospheric pressure etc. for the whole globe. These predications are normally in a monthly scale starting from 1800 up to 2100. Results from the GCM models are then used to simulate future climatic conditions using Regional Climate Change Models (RCM) such as PRECIS by Hadley Center of UK. The advantage of using RCM over GCM relies on the spatial resolution of the model. Normally GCM models predict for every 250 km area of the globe whereas RCM models can predict for every 50 km of the globe. In the Bangladesh University of Engineering and Technology (BUET), PRECIS regional model has been installed and simulated future climatic conditions over Bangladesh until 2100.

The changes of future climate depend on the economic growth, technologic growth, social changes and political conditions. Considering these uncertainty and variability of future predictions, the Special Report on Emissions Scenarios (SRES) was a report prepared by the Intergovernmental Panel on Climate Change (IPCC) for the Third Assessment

Report (TAR) in 2001, on future emission scenarios to be used for driving global circulation models to develop climate change scenarios. These scenarios can be described into four major families-

- A1 scenario family: a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and rapid introduction of new and more efficient technologies. Its three sub groups are: fossil intensive (A1FI), non-fossil energy sources (A1T), or a balance across all sources (A1B).
- A2 scenario family: a very heterogeneous world with continuously increasing global population and regionally oriented economic growth that is more fragmented and slower than in other storylines.
- B1 scenario family: a convergent world with the same global population as in the A1 storyline but with rapid changes in economic structures toward a service and information economy, with reductions in material intensity, and the introduction of clean and resource-efficient technologies.
- B2 scenario family: a world in which the emphasis is on local solutions to economic, social, and environmental sustainability, with continuously increasing population (lower than A2) and intermediate economic development.

Climate models are producing results of various environmental parameters based on the above scenarios families. Fig. 1 has shown an example of future changes of global surface temperature of the world by GCM simulation using all the SRES scenarios-Fig.1. Predictions of the changes of global surface temperature $^{\circ}\text{C}$.

Scientific study has found that the global temperature has been increased $0.74 \pm 0.18 \text{ }^{\circ}\text{C}$ during the last 100 years (reference year 2005) and the increase of average warming predicted by the HadCM3 climate model is $3.0 \text{ }^{\circ}\text{C}$ for 2100. Using the results from climate change models, various applications models such as

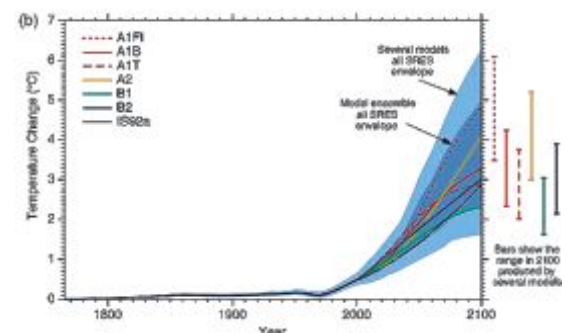


Fig.1. Predictions of the changes of global surface temperature $^{\circ}\text{C}$.

hydrologic models, crop production model, and integrated water resources planning and management model etc. can be simulated to find the future scenarios of natural resources and vulnerabilities. Such findings and predictions using results of climate change models could help us better prepared for upcoming disasters.

Role of ICT in Flood Risk Reduction Through Community Empowerment

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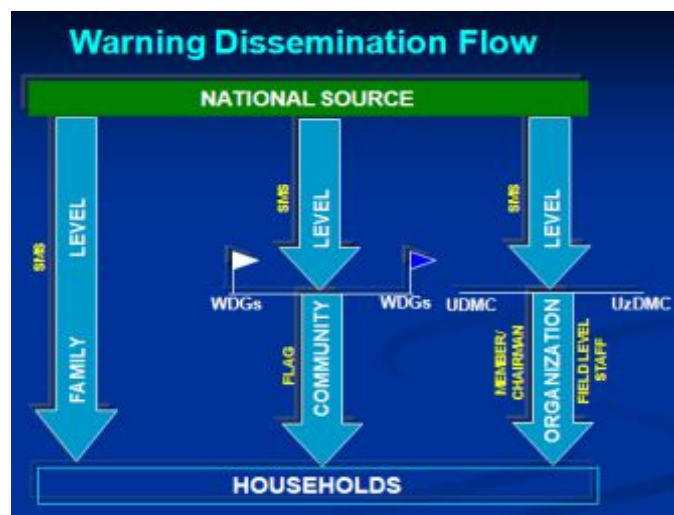
Geographically situated in the downstream, Bangladesh is prone to flood. According to the Water Development Board almost 95% of the water of the rivers of Bangladesh comes from outside of the country specially India, Nepal, Bhutan and some parts of China. In this reality flood control is quite impossible in Bangladesh. In some extent it is possible to reduce flood risk through structural development but due to



the lack of national capacity we can not do that. So the people of this country believe that there is no alternative other than flood forecasting and early warning to reduce flood risk. But during the monsoon flood forecasting and early warning does not reach to the grass-root level. The reason behind that the Flood Forecasting and Warning Center (FFWC) disseminate flood early warning through electronic media i.e. telephone, fax, e-mail, internet, television and newspapers. But due to poor socio-economic condition grass-root people don't have access to these mediums of communication.

With the assistance of USAID recently River Technology Institute (RTI) of -America, Center for Environmental and Gegographical Information Services (CEGIS) and Bangladesh Disaster Preparedness Centre (BDPC) jointly implemented an action research in Doulatpur Upazila of Manikganj and Nagorpur Upazila of Tangail. The main objective of the project was to reduce flood risk through a community-based flood warning system. As a part of Information Communication Technology cell phone was used as a medium of flood early warning dissemination. During the flood season all the individual subscriber, community-based flood early warning dissemination groups, Head of the upazila based GOB departments and representatives of NGOs and members of Upazila and Union Disaster Management Committees of the intervened areas were informed about flood warning through SMS. It is worth mentioning here that considering the understandability of the grass-root people symbolic signs were used for early

warning dissemination and aware community people regarding the interpretation of the symbolic SMS signs. It was proved from the action research that the role of mobile technology is a very effective to disseminate flood early warning at family and community level.



Bangladesh is experiencing a revolution in the field of communication by the use of mobile technology. In Bangladesh due to mobile phone people living in the high risk prone areas can easily exchange their views with others in a comparatively economic rate. The use of mobile phone is increasing in different sectors of development. So we believe that if government takes initiative to disseminate early warning through cell phone, it would play an effective role to community empowerment for disaster risk reduction.

Symbolic SMS	Interpretation
+	Water likely to be increased Half hand within 48 Hours
++	Water likely to be increased one hand within 48 Hours
-	Water likely to be reduced Half hand within 48 Hours
--	Water likely to be reduced one hand within 48 Hours
0	Water likely to be stabled within 48

SMS- Short Message Service
BDPC- Bangladesh Disaster Preparedness Center

CEGIS River bank erosion prediction tools

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River bank erosion is one of the major natural disasters of Bangladesh. The main rivers such as the Jamuna, the Ganges, the Padma and the Lower Meghna are very dynamic in nature. These rivers annually erode about six thousand hectares of

floodplain land damaging or destroying different types of infrastructures. Erosion has been considered as a social hazard since it makes thousands of people homeless and landless every year. So it is the concern issue of government as well as funding agencies to

protect floodplain. Early prediction is one kind of protective measure. Bangladesh Water Development Board (BWDB) is trying to protect the cities, towns and valuable lands from erosion with the limited resources. Considering the extent and intense of the riverbank erosion, the effort of BWDB seems to be negligible. In such a situation, to minimize the national losses and the sufferings of the erosion affected people and to ensure optimum resource utilization non-structural measures such as erosion prediction would be an effective option.

CEGIS has been making prediction of river bank erosion for the major rivers of Bangladesh since 2004. Every year it evaluates previous year's prediction. It has been found that CEGIS made erosion prediction has a good match with real scenario. CEGIS has been making awareness to some hot spots by rising different coloured flags indicating different altar zones. It prepared posters indicating detail of vulnerability of different infrastructures at those locations. Last year (2008), social awareness was made in four locations along the Jmauna and the Padma. Locations were: Kazipur and Kajjuri at Sirajganj district (along the Jamuna), Aliabad at Faridpur district (along the Padma) and Hasail Banari at Munshiganj district (along the Padma). At the starting year (2007), response to erosion prediction of local people was not so good. But in the second year (2008), they were responding promptly after observing a very well matching of prediction in previous year.



Strategic Use of ICTs for Poverty Reduction

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Project Description

Dwip Unnayan Songstha (DUS) being a potential network member of BNNRC (Bangladesh NGOs Network for Radio & Communication) having the support from One World South Asia (OWSA), India has launched a project titled as “Strategic Use of ICTs Poverty Reduction” with view to strengthening the grassroots voice through the appropriate application of ICTs as a tool for reducing extreme poverty of the coastal Island community of Bangladesh. The project has delivered its services at Hatiya Island Upazila of Noakhali district. Community participatory approach with cost sharing paradigm was followed to implement the project.

Output of the project

- Developed ICT (volunteers) Catalyst (EK Dunya Fellows) in Island Society. As a first track to access to ICT facilities for Islander, a cadre group for promoting ICTs use & utilization for life saving purpose on various good impacts of ICT equipments on people life.
- National Policy makers are sensitized on role of ICTs for Poverty Reduction. DUS has launched a nation level inception meeting of the project focusing the promotion of ICTs in order to raise voices of islanders including landless & marginalized community for enabling them to recover from poverty & natural hazards
- ICTs tools for Indigenous early warning dissemination on disaster are popularized. The Volunteers trained under the project undertook disaster warning tools addressing the indigenous knowledge and capacity in connection to Cyclone & Tsunami caution. Local Flags hoisting as an indigenous ICTs tools for early warning dissemination has been spread up and popularized among the target communities.

- Local Media advocacy & Rights canvas developed with local news clipping. The project staffs & volunteers have advocated with local media for promoting right of the landless & fishermen community especially to broaden the way for access to basic rights like khasland (State owned land), education, and health etc. such media coverage are incorporated and compiled in a canvas so as to call attention of the civil society to aware them on human rights.
- Exchange of Knowledge from ‘global to local/Local to global; vice-versa. As a regular practice under integrated development program, the knowledge gained from local people & global forum are mutually exchanged among the staff members, volunteers & community leaders under DUS program framework.
- DUS already has taken initiative for installing Community RadiM. As a multiplier effect of the ICT development program including for installing a COMMUNITY RADIO station to make sure the information service for the people of disaster prone area especially to provide the people with updated livelihood & life saving disaster messages.

Conclusion

Appropriate tools for communication towards transfer of knowledge are the key development phenomenon for undertaking any socio-economic paradigm aiming to empower & strengthen a community with optimum access to social dignity & safety. All the key stakeholders including local Govt authorities and civil society members was very supportive in implementing this project. DUS believes the project has put an important milestone in promotion of ICT in poverty reduction in the most vulnerable island community in Bangladesh.



ICT, Digital Divide, and Disaster Risk Management in Bangladesh

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Introduction

A major portion Bangladesh is extremely vulnerable to both seismic and hydro-meteorological hazards such as floods, typhoons, droughts, and derivative disasters such as forest fires and landslides. This vulnerability is compounded by socio-economic conditions, which exacerbate the impact of disasters. Looking at the events of the last few years it is evident that by no means natural or manmade disasters could be fully prevented. Only the loss caused by these events can be reduced. Information and Communication Technology (ICT) can be used to minimize the impact in many ways.

ICT can be used in almost all phases of the disaster management process. In the disaster mitigation and preparedness process, ICT is widely used to create early warning systems. An early warning system may use more than one ICT media in parallel and these can be either traditional (radio, television, telephone) or modern (SMS, cell broadcasting, Internet). In addition, geographical information systems (GIS) and remote sensing software are being effectively used in all phases of disaster management. However, the realization of development gains from ICT requires the rather widespread diffusion of the technology through a vertical, multi-level process that delivers access to the technology to disadvantaged communities and individuals. This growth in connectivity is expected to substantially increase interactive communication between distant centers, permit improved governance through the more efficient delivery of information and a range of social services in rural areas as well as expand access to the Internet and the benefits it can provide.

While the role of Information and Communication Technology is undeniable in Disaster Risk Reduction, majority people living in the disaster prone rural areas still has almost zero access/knowledge to ICT options. Lack of financial affordability and illiteracy are two major causes driving people away to have digital device and induced benefit from that. This gap known as Digital Divide is strongly felt. Many believe that choosing the Digital Device is not a top priority in DRR arguing instead that the poor need food and jobs before they need to access to information. However, what they do not realize is that access to digital technology greatly enhances the effectiveness and affordability of efforts to improve the capacity and coping mechanism in disaster situations.

Digital Divide- what is it?

Digital Divide refers to the gap between those who benefit from digital technology and those who do not. The term "Digital Divide" has become widely used to denote the inequity in the opportunities presented by ICT and the digital revolution. "Digital Divide" has been defined by OECD as "The gap between individuals, households, business and geographic areas at different socio-economic levels with regard both to their opportunities to access Information and Communication Technologies (ICTS) and to their use of the internet for a wide variety of activities". To the extent that lack of technology can be associated with deprivation, we can therefore appropriately talk about the "Digital Divide." But technology is not always a problem. It is clear that technology remains inert and useless without necessary human skills and competences. Technologies become real when they are combined with knowledge and capabilities to use them, and when they are embedded in social practices. In discussing digital divides, we therefore have to reject purely technological characterizations, and discuss appropriate combinations of technological and human capabilities. The real issue in using Information and Communication technology is not so much about access to digital technology but about the benefits derived from access. Examining the situation more closely, it turns out that upper-to-middle classes have high-quality access to digital technology. The poor are ignored because market forces assume that designing solutions for them will not be profitable. The result is that even where the poor are provided access to digital technology, it is low-quality and merely "localized" versions of products and services intended for the rich. Furthermore, the digital technologies they do have access to, such as those that lure innocent villagers into vapid pop culture, could be harmful rather than beneficial.

Why does Digital Divide concern in Disaster Risk Reduction

South Asia - often considered as an ICT powerhouse, is also the home of highest number of disaster prone people. We still do not adopt the culture of pre-disaster management (early warning, information sharing or preparedness training) rather we emphasize post disaster relief and rehabilitation. Some of the big invested program like CDMP is trying to make shift culture from relief to risk reduction but institutional constraints at the government level making the progress slow onset. Then what ICT can do? We refer ICT as a process that can help achieving certain objectives more effectively, quickly and without the need of any gate keeper. To our view, ICT doesn't replace the need of post disaster relief rather ICT can complement this process. ICT revolution has spearheaded the growth of knowledge

societies breaking all geographical boundaries and barriers and bringing even remote areas into the mainstream by connecting them to information super highways.

How to minimize "Digital Divide"

A study by ESCAP shows that both phone and internet use has increased over 10 times in Bangladesh. By contrast, the gap between rich and poor nations in internet access has widened over the same period of time. But this situation can be triumph over by capacity building and sharing of successful experiences. The integration of ICT in effective disaster risk reduction programs, for example, by providing technical solutions such as region-wide early warning systems, internet access and better communications systems to assist with disaster recovery. The following ways we can minimize the digital divide;

Disaster Resource Network is a nation-wide electronic inventory can be an organized information system for collection and transmission of information about specific equipments, human expertise and critical supplies database from village, district to national level for disaster response, so that disaster managers can mobilize the required resources within least response time.

GIS in Disaster Management by using Geographic Information System (GIS) provides the most versatile platform for decision support by furnishing multilayer geo-referenced information and quickly assesses the impact of the disaster/emergency on geographic platform and plan adequate resource mobilization in most efficient way.

Community Radio is widely believed that radio being cheap, accessible and rugged is the ideal medium for community communications, especially among the poor and

marginalized groups who are particularly vulnerable to natural and man-made disasters.

ICT deploying community multimedia in risk-prone areas could play a significant role in disaster preparedness, warning and mitigation. We can mobilize the young and children by providing valuable information and developing awareness. In the immediate aftermath of a disaster, special software packages can be built for the purposes like registering missing persons, administrating on-line request management databases and keeping track of relief organizations or camps of displaced persons.

Conclusion

With scarce resources available for very basic development needs, many people wonder why bother to provide these new technologies, and whether they are not unnecessary luxuries in many contexts. It is not an "either-or" scenario anymore, recent increased intensity of disaster signify that, these technologies are nothing more than advanced information tools to be used if/when it is beneficial to reduce the risk of disaster. Among all disaster prone and vulnerable people it may to be the first priority; perhaps ICTs can help him find ways to be well prepared and having up to date information concerning disaster. The issue of ICTs and reducing the digital divide is ultimately about greater choices achievement of an equitable global village, where all the people in the world are able to live a contented and fulfilling life is a dream. This can only happen when we are able to build a strong digital bridge and empower vulnerable societies to gather the benefits of technologies to reduce disaster risk using the tools now available from information and communication technology revolution.

Up Coming Training Programs of NIRAPAD

1. Community Based Disaster Risk Reduction Approach: Making Disaster Resilient Community, (18-20, May)
2. Disaster and Livelihood: The Forward-Thinking to Reduce Vulnerability,
3. Disaster Vulnerability: Key to Reduce Disaster Risk,
4. Minimizing Disaster Risk of Microfinance Operations; Offsetting Affects of Micro-finance on Disaster,
5. Emergency Response and Contingency Planning for Small Enterprise and Local NGOs
6. Climate Change Adaptation and Disaster Mitigation
7. Participatory Monitoring and Evaluation of Disaster Management Project
8. Implications of ICT in Disaster Risk Reduction

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