Research Introduction

Introduction of Geoinformatics Researches at Stamford University Bangladesh

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1. Introduction

Stamford University Bangladesh (Fig. 1) is one of the best private universities in Bangladesh. It is located at the center of Dhaka, the Capital of Bangladesh. It was established in 2002 with the motto “We Bring out the Best in You”. It is under the direct supervision of the Ministry of Education and University Grants Commission of Bangladesh. The Chancellor of the university is his excellency the President of the People’s Republic of Bangladesh. The founder Vice Chancellor was Prof. Hannan Feroze. It is run by a board of trustees. Current president of the board of trustees is Mrs. Fatinaaz Feroz and Vice Chancellor is Prof. Mohammad Ali Naqi.

There are five faculties (Faculty of Business Studies, Faculty of Science, Faculty of Arts and Social Science, Faculty of Law and Faculty of Engineering) and fourteen departments (Departments of Business Administration, Computer Science and Engineering, Law, Pharmacy, English, Microbiology, Civil Engineering, Electrical and Electronic Engineering, Architecture, Environmental Science, Film and Media Studies, Economics, Journalism and Media Studies, Public Administration, Bangladesh Studies and Natural Sciences) in this university. There is also a Japanese Language Centre. Number of current students are more than 12,000 and faculty members are about 300. Its programs are run through trimester. One semester comprises four months. Students have to complete (137-140) credits and 40 credits to achieve Bachelor and Master degrees, respectively.

Stamford University Bangladesh is dedicated to establish an excellent academic environment through the continuous development of academic programs. The Department of Environmental Science at Stamford University Bangladesh was established with the vision to enhance the quality of teaching and research activities for sustainable development and environmental conservation. It also offers training ranging from EIA, Occupational Health and Safety (OHS), GIS, water quality monitoring, etc.

2. Geoinformatics Researches at SUB

Bangladesh Space Research and Remote Sensing Organization (SPARRSO) is the main space and remote sensing research and monitoring organization in the country. The public universities as well as some private universities have some remote sensing and GIS research centers. The Center for Environment and Geographic Information Services (CEGIS) and Bangladesh Centre for Advanced Studies (BCAS) are the main private research organizations for remote sensing and GIS research. In our country remote sensing is mainly applied for flood monitoring, river and coastal erosion-accretion, water resources management, environment, agricultural crop mapping, natural resources mapping, telecommunication, urban planning etc. The main GIS activities of SPARRSO are to facilitate remote sensing and other spatial data for various applications in environment and resource sectors. The department of Environmental Science at Stamford University Bangladesh has Physical Laboratory and GIS & Remote Sensing Laboratory. The financial support for the research is funded by the Ministry of Science and Technology, Ministry of Education, Government of the People’s Republic of Bangladesh and Stamford University Bangladesh. Undergraduate
and MS students should carry out a project work and a research respectively, as a partial fulfilment of the requirement of the Degrees. Our laboratory has collaborations with some research organizations and universities in home and abroad. Most of their researches are related to different environmental issues.

My doctoral research focused on geoinformatics study on characterizing spatio-temporal hydraulic behaviors of groundwater in Kumamoto Area. It was carried out at Prof. Katsuki Koike’s Lab at Kumamoto University, Japan. It focused on geostatistical modelling of the effects of precipitation and earthquake on groundwater level changes in the study area. Groundwater level changes both in shallow and deep level due to precipitation were done by ordinary kriging (OK) and co-kriging (CK) method (Fig. 2) in Kumamoto City, Japan (Parvin et al., 2011). It was found that the CK result was better than that of OK.

We also investigated the effects of four earthquakes namely, the Kumamoto Earthquake (KME), the Geiyo Earthquake (GYE), the Fukuoka West Offshore Earthquake (FOE), and the Sichuan Earthquake (SCE) occurred in 2000, 2001, 2005, and 2008, respectively on the groundwater levels at the wells in the Kumamoto City area. To examine the spatial distribution of the changes in shallow and deep groundwater levels in detail, the level changes were interpolated using a spline (Fig. 3). In addition, coseismic pressure change maps were prepared (Fig. 4) for the shallow and deep groundwater level due to those earthquakes (Parvin et al., 2014).

Our research group is also involved in environmental science and geoinformatics research. Recently, quality of life with respect to different aspects in Dhaka City was evaluated and represented geostatistically (Fig. 5; Parvin et al., 2017). Geoinformatics played also a key role in assessing noise level. Recently, our lab investigated the noise levels of different locations in Bangladesh and showed the comparison by means of GIS. Because noise pollution has been well recognized as one of the major trepidations that impact the quality of life in urban areas. Assessing and mapping of noise pollution levels in Dhaka City (Fig. 6; Parvin et al., 2016) and Mymensingh, another city in Bangladesh has been done at our laboratory (Fig. 7; Parvin, 2020).

It shows spatial distribution of noise level of the study area that may help the policymakers to plan to control noise pollution effects.

Figure 2. Spatial distribution of annual averages of the shallow and deep levels in 1993, 1994, and 1998 produced by co-kriging method (Parvin et al., 2011).

Figure 3. Coseismic level change maps for the shallow and deep groundwater due to earthquake produced by spine method (Parvin et al., 2014).

Figure 4. Spatial distribution of coseismic pressure change for the shallow and deep groundwater due to earthquakes in Kumamoto City, Japan (Parvin et al., 2014).
3. Future Projects

Our future projects of the Department of Environmental Science (Photo) aim at:

- Monitoring and mapping of microplastics in the rivers of Bangladesh as it has become a major concern for the environmentalist.
- Land cover changes detection of rural and urban areas of Bangladesh using GIS and remote sensing will be investigated to observe the effects of environmental changes on land cover.

References

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