Report of the Mymensingh Regional Workshop (Mymensingh and Sherpur District)

on preparing

'Draft Watershed Management Policy and Developing Implementation Framework'

Organized by: IUCN, International Union for Conservation of Nature and Natural Resources
Supported by: FAO, Food and Agriculture Organization of the United Nations

Date: 2 March (Monday), 2020; **Time:** 02:30 pm – 5:30 pm
3 March (Tuesday) 2020; **Time:** 10.00 am – 01.00 pm

Venue: Conference Room of Faculty of Agriculture, BAU, Mymensingh
Conference Room of DD Office, DAE, Sherpur

Submitted by:

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1. Background

Mymensingh division is located at 24°15'–25°12' N, 90°04'–90°49' E and covers four districts namely, Mymensingh, Sherpur, Jamalpur and Netrakona (Figure 1). It has an area of 10,485 square kilometres (4,048 sq mi) with a population of 11,370,000 as of the 2011 census. Mymensingh region lies in the north-central part of the country bordered by the Meghna River in the east, Gazipur district in the south, the Jamuna (Brahmaputra) River in the west, and Garo hills of Meghalaya of India on the north. Main occupations are; agriculture 57.67%, commerce 8.15%, transport 15.66%, construction 2.13%, service 1.21%, others 15.18%.

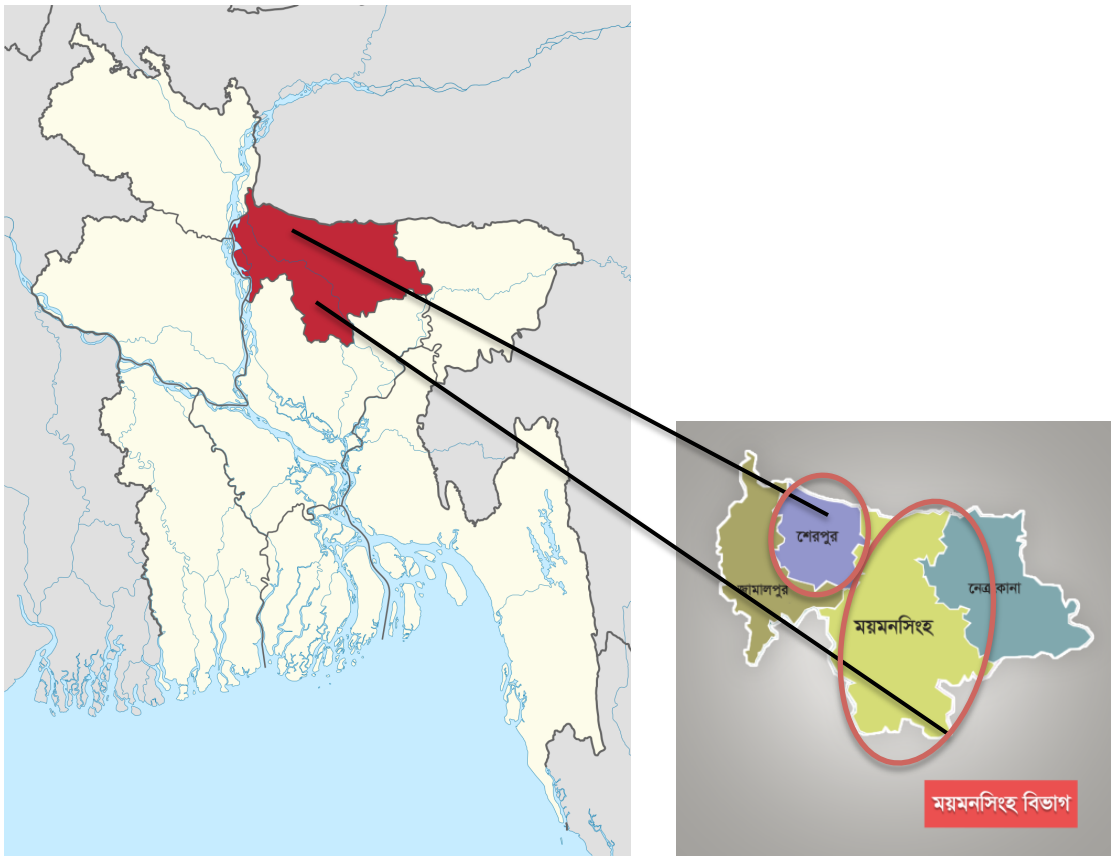

Figure 1: Workshop Location

Geography

The Old Brahmaputra River runs through the area flowing from the northwest and to the southeast. In the southern part of the area, the Modhupur Tract of Old Alluvium with an elevation of about 15 m appears in the lowland area of about 3m elevation. Other than Brahmaputra River, numerous channels drain this flood plain. Old Brahmaputra River and these channels have formed the drainage network of Mymensingh. Illegal grabbing of these rivers and canals have been going on for ten to fifty-five years with concrete, semi-concrete and makeshift structures mostly

used commercially. Apart from this, this area largely is comprising of agricultural fields, includes (i) Deciduous forests of Sal and other mixed species, which are moderately grown in Mymensingh, and (ii) Chars or small islands in the major river systems.

Climate

Both the summer and winter are relatively mild in this region. The maximum and minimum temperatures as observed in April and January range between 33.4°C and 12°C. Rainfall starts in May and continues upto September. Annual average rainfall at Mymensingh is 2,541 mm, 66% of it concentrated in monsoon season (June - September) and only 3% of the annual rainfall in dry season (December - March).

Water

Water resources are polluted by municipal waste and industrial effluents containing trace metals and pathogens. Trace metals like Cu, Zn, Mn, Fe, Ni, Cd, Cr, Co, Pb etc. are usually present in water at low concentration, but enhanced concentration of these metals have found as a result of human activities. Furthermore, excessive / inappropriate use of agricultural input (fertilizers, agrochemicals) may affect surface and ground water to some extent. At present, there are no clear indications of water pollution by this reason. However, Bhaluka is a newly industrial growing site of Mymensingh, Bangladesh, which is highly susceptible to environmental pollution over last decade. Almost all industrial units are discharging their untreated wastes in the surface drains and spread over agricultural fields.

Soil

The soils in the District, except for a minor area of hill soil in the northern border, are formed with recent and sub-recent alluvial sediments. Most of the soil has silty clay texture and low contents of organic matter. The Modhupur Tract upland soil associations in the form of deeply dissected terrace with brown clay loam are present in the western part of the District. The soil in the northern part contains mixed grey silty clay of the oldest piedmont alluvium plain, which has been changing southwards into the Brahmaputra floodplain ridges and basins. In the central and southern parts, the soil is therefore, dominated mostly by the old Brahmaputra floodplain complex in the form of grayish silty clay loam. Low moisture holding capacity, complex relief and soil pattern, erodibility of sloping soils and upland edges are main limitations for agricultural practices. In addition, brick kilns pose a great threat, which have hampered soil fertility status by cutting topsoils. Moreover, the same locations have been utilizing for years and the biomass energy used for firing bricks resulted serious environmental pollution and decreased soil nutrient status.

Natural disaster

Placed between the Brahmaputra and Meghna, and with the Old Brahmaputra flowing in the area, this region is most likely to be effected by flooding during the rainy season. The northern hillsides of this region are also influenced by flash floods, where intensive rainfalls on the mountains result in rapid rise of water level.

Compared to floods coming from increase of water levels in rivers, flash floods are difficult so far as it relates to taking precautionary measures. Agricultural production is largely effected when this occurs in pre-monsoon (season for Boro) and late summer (season for Aus).

2. Objective of the workshop

The overall objective of two workshops was to understand different stakeholder's perceptions of existing watershed and its management to provide information regarding draft national watershed policy and implementation framework.

The specific objective of the workshop was to obtain scientific and experience based inputs involving local experts, policy makers, academic and researchers and finally end users viz. community and farmers opinion and their perspective regarding delineation of water and soil degradation and conservation scenario of Mymensingh region and policy recommendations to support IUCN in preparing Draft National Watershed Policy and its implementation framework.

3. Brief description of the workshop

More than 50 participants from Mymensingh and 42 participants from Sherpur district participated in those two workshops. The participants involving government officials viz: UNO (Upazila Nirbahi Officer), DAE, DoE, SRDI, BADC, Department of Forest, Department of Fisheries, BWDB, City Corporation, UNO (Upazila Nirbahi Officer), and non-government officials (For example: Buro Bangladesh), academician (BAU), scientists, professionals, public representatives (Elected Councillor, Members), farmers, journalists (printing and electronic media) and civil society members. They individually raised their voice about soil and water management in context of their locality and put forward a set of recommendations on how to formulate an effective watershed management policy.

4. Policy perspective

Over the past three decades, the Government of Bangladesh (GoB) attempted to introduce policies to monitor and regulate water resources, though practical and sustainable solutions have proven elusive. In the year 1985, the GoB introduced an ordinance exclusively for the management of agricultural groundwater resources. In this ordinance, licensing was introduced to restrict installation of private tube wells in critical areas where groundwater was falling at rapid rates and/or where groundwater quality was deteriorating. Subsequent laws such as the National Environmental Policy (1992), National Policy for Safe Water and Sanitation (1998), and National Water Policy (1999) stressed the need for the protection of surface water and groundwater resources. The more recently introduced 'Water Act' of 2013 makes it mandatory for any individual to obtain a license/permit for large-scale withdrawal of groundwater by individuals and organizations beyond domestic use.

5. Outcomes of the workshop

During the workshop, scientific and experienced based opinions have been identified. It highlighted both the problems and solutions of watershed management in context of riverine floodplain, char, haor and hilly area of Mymensingh and Sherpur district. These are summarized below-

Changes of Land Use Pattern

Rapidly increasing population growth has resulted in high rates of deforestation and large tracts of forests transitioning into cultivated land. Apart from this, there is a trend observed in Mymensingh district that agricultural land is converting into other type of land use, especially applicable for the low lying rice field into fish farming and also infrastructural development for rapid growth of urbanization. The fish farming is 2-3 times more profitable than rice farming. Secondly, seasonal casual labour shortage in rice farming induced converting low lying inland into fish farming. For example, the area of agricultural land was decreased by 15.5%, 17.29%, and 27.82% and converted to fish farming by 13.35%, 8.93%, and 16.95% in the year of 2006, 2011 and 2016 for Muktagacha, Fulbaria and Trishal upazilas of Mymensingh district, accordingly. Without the prior concern of the legal entity, the land classification cannot be changed.

Irrigation

Groundwater is extensively used for irrigation as well as domestic purposes in this area. Due the withdraw of excessive water from the ground level, it causes depletion in many areas of Mymensingh and Sherpur district. Therefore, judicial withdrawal of groundwater is mandatory. The spacing of shallow and deep tube well should be maintained.

On the other hand, rice, particularly, boro rice needs more water (To produce 1 kg of rice, it requires 2500-4000 litre of water), therefore, less water-consuming crop should be practiced. Moreover, fruits and vegetable should be cultivated in high land whereas boro/aman should be practiced in medium or low land.

Establishment of database for groundwater recharge and withdrawal considering each aquifer capacity, boundary and how much water to be recharged and harvested:

Aquifer management is considered as the most effective away of establishing a balance between discharge and recharge components. Hydro geological characteristics and properties of an aquifer, fluctuation of static groundwater level, recharge and depletion characteristics of the aquifer is to be known to determine the yield potentiality of the aquifer. In Mymensingh region, there is a lack of database for both groundwater withdrawal and recharge information. Database is crucial for optimization of groundwater use efficiency. The database can also be strengthening through computer simulation and modelling. This will also helpful to take initiatives of recharge options specially rainwater through borehole system.

Water reservoirs

A number of rivers, beels and canals flow over in Mymensingh region. Some of these are drying in the dry season and in some cases, this water is not suitable for domestic, irrigation and livestock consumption. For instance, the water quality is too bad in bhaluka upazila that contains heavy metals. During the monsoon, it is imperative to conserve water in surface sources by

- Rainwater harvesting
- Reexcavation of ponds, canals

Besides, dredging of rivers, haors and beels should be done to increase water capacity.

Land degradation

Loss of topsoil layers due to removal of vegetation (mainly forests) and change in hydrological conditions, siltation due to floods, changes in chemical and physical soil properties due to inappropriate cropping pattern and use of agrochemicals are the main effects related to land degradation. Also, construction of embankments and other water related infrastructure is causing erosion and siltation. The Modhupur forest area, partly lies in Mymensingh district is under heavy deforestation, and is deemed vulnerable to land degradation.

Using topsoil in brickfield

In Mymensingh district, some 400 out of 500 brickfields have no clearance from the Department of Environment, on the other hand, some 142 illegal brick kilns are running defying ban. 284 cores of cubic feet of soil, mainly topsoil is using in brickfield. As **topsoil** has the highest concentration of organic matter and microorganisms where most of the earth's biological soil activity occurs, therefore, losing of topsoil not only causes land degradation through decreasing soil quality, fertility, productivity but also reducing crop land and crop yield. These lands cannot be used further for cultivation until many years and or land productivity decline in many ways.

Although the government has decided to use 10 percent alternative bricks, however, alternative of bricks is unavailable and clay brick ban was not possible as brick is essential in all development activities. The government plans to use environment-friendly bricks in construction instead of traditional bricks manufactured by burning the topsoil of the agricultural lands, in the next five years to curb air pollution. The government has decided to use 10 percent alternative bricks in all public projects during 2019-20. The figure will go up to 20 percent the following year, 30 percent in 2021-22, 60 percent in 2022-23, 80 percent in 2023-24 and 100 percent in 2025.

Box 1

Voice form the field

"With the hope of getting expected production of crop from land without topsoil, I applied overdose of fertiliser and pesticide, but the result is not as expected," said Sudhir Chandra Roy, 48, a farmer of Purbo Nawdabansh village in Hatibandha upazila. "I am very disappointed with the productivity on four bighas of land after selling the topsoil," he said. "I used to harvest three crops per year, but now I get one crop in a year," he said,

Soil health quality:

Soil quality deterioration is a major concern through use of agricultural inputs especially excessive use of chemical fertilizers, and other agro-chemicals. On the other hand, microbial population in soil also decreased with the elapsed of time and it is an important indictor for soil health determination. Hence, there is an urgent need of soil quality assessment and based on that "Soil Protection Act" can be formulated.

In addition, "Soil Health Policy" is another concern in modern agriculture. Soil condition can be improved or restored by the following ways:

i. Soil Test based fertilization (Site specific fertilizer recommendation)
ii. Reduced use of chemical fertilizers in combination with organic fertilizer considering IPNS (Integrated Plant Nutrient System: 70% inorganic source and 30% organic source)
iii. Use of organic fertilizer: Vermi-compost, *Tricho* compost, enriched municipal solid waste compost, Poultry manure, cow dung etc.

1.

ETP (Effluent Treatment Plant) and Zero liquid discharge from Industries:

Discharge of industrial effluent is a prime source of surface water pollution (especially rivers) in Bhaluka, Mymensingh. This ETPs should operate properly and discharge should be dump in the open water sources before proper treatment. Zero liquid discharge from industries especially dying industries should give more attention to save our soil and water resources.

Box 2

In Bhaluka upazilla, Mymensingh District, although there are 55 ETPs out of 56 industries, but most of the ETPs are not running properly due to huge cost involvement issues. In most cases, industries directly discharge their effluent into the open water bodies, which carries toxic heavy mental cause water pollution and destroy aquatic ecology and biodiversity. With this contrast, it is mandatory to function all ETPs and thereafter discharge treated water to the open water bodies having year round monitoring by legal authority.

Another important consideration of zero liquid discharge from industries following reuse, recycle and reduced use of water resources.

Application of Biofloc fish culture:

Biofloc technology is a technique of enhancing water quality and water use efficiency in aquaculture through balancing carbon and nitrogen in the system. Popularization of this technique will reduce the pressure on soil through excavation of new ponds.

Crop diversification

Crop diversification is considered as a strategy of reducing the reported problems. It

is also considered as an effective approach to utilize scarce land and valuable water resources, which makes agriculture sustainable and environment friendly (Kumari *et al.*, 2010).

Crop zoning

Crop zoning should be customized based on i) agroclimate, ii) soil condition, iii) farmer's attitude and willingness, iv) crop suitability considering high value crop.

Integrated farming:

Multi-layered cropping can be practiced to diminish extra burden of agricultural lands. At the same time, mixed wetland rice and fish culture is another alternative options for profitable agriculture. Pond dyke vegetable cultivation can also be popularised for extra income generating activities with fish and meet the household demand.

Adoption of water saving technology:

Improving water use efficiencies through the adoption of resource conserving crop management practices such as alternate wetting and drying (AWD), direct-seeded rice, drip irrigation for fruit and vegetable crops and bed planting could help in reducing groundwater demand for agriculture. Furthermore, sub-surface and piped irrigation to diminish water loss through surface runoff and evapo-transpiration. Water pricing for both homestead use and agricultural purposes and also prepaid water use should be practiced. Furthermore, charging water on a volumetric basis or crop specific pricing, fixing quotas for groundwater extraction for different users.

Application of Conservation agriculture practice to conserve soil and water:

i. Minimum tillage (minimum tillage save 33% water than conventional tillage during land preparation)
ii. Crop residue retention (This will help to preserve soil moisture and increase soil fertility after decomposition)
iii. Crop rotation with cover crops (This will help to reduce soil erosion and biological nitrogen fixation)

Strengthening Upazila Irrigation Committee:

Groundwater Management Rules for agriculture 2019 enacted by ministry of agriculture. According to this rules, upazila irrigation committee will supervise and recommend installing shallow or deep tube well for irrigation purposes in any places of upazila without a licence granted by the *Upazila* Parishad. It has 9 members where UNO is the president and assistant engineer of BADC/BMDA is the member secretary. It is often found that the upazila irrigation committee's activity is poor. To ensure the licensing of tube wells and the effective irrigation facility, this committee should be strengthened with the active participation of all members.

Forest restoration:

Distribution of forest helps to control microclimate of the locality and helps to restore soil and water resources through precipitation and surface cover

establishment. Illegal timber collection and over grazing by cattle may cause forest destruction and soil erosion. Hence, forest restoration by providing manpower as well as taking afforestation initiates.

Box 3
Good practice
Sal forest restoration as a weapon to conserve soil and water: Sal forest is a unique characteristic in *Garo Hill* of Sherpur District. This *Sal* forest loose its potentially through over grazing and illegal cut down of trees by the muscle men. Recently, forest department took an initiative to restore *Sal* forest under *SUFOL* (Sustainable Forest and Livelihood) project by planting 2.5 million plants of different species. The authority also plans to conserve *Sal* forest and used for eco-tourism, which helps to maintain microclimate and reduce soil erosion and conserve water resources.

Construction submerged road in Haor:
Due to the geographical settings, Mymensingh region has Haor basin. For conserving water in Haor, submerged road construction is essential. Planned submerged road construction is critical to maintained natural water flow and ecological diversity.

Political willingness:
Political willingness (harmonization between commitment and execution) is one of the key determinants for proper implementation of any policy. Hence, political ecological environment should be addressed appropriately when policy formulation is done.

Budget for Research and innovation:
Research based scientific knowledge and innovations is utmost important for conserving soil and water resources. Therefore, in the proposed policy, there is a provision of sufficient budget for innovative problem solving action-oriented research considering the citizen science approach.

Inter-ministerial coordination:
Soil and water resources belong to Ministry of Land, Ministry of Agriculture, Ministry of water resources, Ministry of LGRD, Ministry of industry, Ministry of textiles and Jute and Ministry of DMR, Minitry of Environment, Forest and climate change. So, inter-ministerial coordination is very important to formulate watershed policy.

Embracing hard engineering and soft socio-economic measure:
i. Construction of rubber dams to conserve water
ii. Establishment of switch gate to control water flow and maintain water demand and supply
iii. Creation of concrete irrigation channel
iv. Individual and community participation

v. Practice N-help: Co-funding, co-ownership, co-management, co-creating, co-learning and co-sharing

Good water governance

Top down and bottom up governance structure and process is essential for good water governance. Active participation of local stakeholders having gender balance at all levels of policy formulations, planning, implementation and execution, monitoring, evaluation process is mandatory. Apart from these, accountability, transparency, rules of law should be maintained strictly to manage watershed considering local context. The natural flow of the watershed areas never be impeded by the power of the musclemen and influential people.

Ethical development:

Moral principles that govern a person's behaviour in developing countries is a critical aspect of conducting of an activity very efficiently and effectively. Ethical development of a person can lead an event very smoothly with highest level of devotion and honesty. With this contrast, ethics should consider as an integral part of human to conduct his or her duties without any interference.

Key messages:

1. Water demand (especially groundwater) for irrigation can also be reduced by rationalizing cropping patterns. Decreasing water availability both in terms of quantity and quality suggest that the unchecked expansion of dry season rice cultivation is probably not a long-term option.
2. For sustainable groundwater resource management, involvement of water users, investments in improved water and agricultural technologies, charging water on a volumetric basis or crop specific pricing, fixing quotas for groundwater extraction, facilitate markets for non-rice crops, promotion of alternative cropping patterns, and extra support for farmers making transition to less water demanding crops is needed.
3. Political willingness (harmonization between commitment and execution) is one of the key determinants for proper implementation of any policy. Hence, political ecological environment should be addressed appropriately when policy formulation is done.
4. There is a need to work on awareness raising through educational program for all stakeholders. Aside from this, mass awareness program should also be adopted. programs for all stakeholders. Aside from this, mass awareness program should also be adopted.

6. Implementation framework should consider the following issues:

i. Link to SDGs
ii. Employment generation opportunity
iii. Long term policy
iv. Good governance through professionalism

News on printing media

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৬ | ময়মন

সংক্ষেপে

শেরপুর

প্রস্তুতকরণ কর্মশালা

শেরপুরে খসড়া পানি বিভাজিকা ব্যবস্থাপনা নীতি ও বাস্তবায়ন কাঠামো প্রস্তুতকরণ শীর্ষক কর্মশালা অনুষ্ঠিত হয়েছে। গতকাল দুপুরে শহরের চকপাঠক এলাকার খামারবাড়ি মিলনায়তনে অনুষ্ঠিত এ কর্মশালায় সভাপতিত্ব করেন বাংলাদেশ কৃষি বিশ্ববিদ্যালয়ের মৃত্তিকাবিজ্ঞান বিভাগের অধ্যাপক মো. আনোয়ারুল আবেদীন। স্বাগত বক্তব্য দেন আইইউসিএন বাংলাদেশের সিনিয়র প্রোগ্রাম অফিসার এ বি এম সারওয়ার আলম। এফএও সহযোগিতায় আইইউসিএন বাংলাদেশ এ কর্মশালার আয়োজক। বক্তারা বলেন, অতিমাত্রায় বা অনিয়ন্ত্রিতভাবে ভূগর্ভস্থ পানি ব্যবহারের ফলে মাটিতে পানির স্তর নিচে নেমে যাচ্ছে। ফলে শুষ্ক মৌসুমে সেচসংকট দেখা দিচ্ছে। এ থেকে রক্ষা পাওয়ার জন্য প্রাকৃতিক উৎস থেকে প্রাপ্ত পানির ব্যবহার বাড়াতে হবে। বিশেষ করে বর্ষা মৌসুমে আসা অতিরিক্ত পানি সংরক্ষণের জন্য জলাধার নির্মাণ করা প্রয়োজন।

প্রতিনিধি, *শেরপুর*

Daily star

DHAKA **TUESDAY MARCH 3, 2020,**

Conserve water, soil to ensure dev: speakers

OUR CORRESPONDENT, *M'singh*

Speakers at a workshop yesterday said soil and water are essential for development, so these natural resources should be conserved.

To feed the ever-growing population and work toward development, extensive pressure is being put on soil and water resources, they said at the workshop at Faculty of Agriculture of Bangladesh Agricultural University.

The discussion titled "Draft Watershed Management Policy and Developing Implementation Framework" was organised by International Union for Conservation of Nature (IUCN) and funded by Food and Agriculture Organization.

সোমবার, ৯ মার্চ ২০২০ ॥ ২৬ ফাল্গুন ১৪২৬

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বাকৃবিতে আইইউসিএনের কর্মশালা অনুষ্ঠিত

০৩/০৩/২০২০ শিক্ষাঙ্গন

বাকৃবি প্রতিনিধি:

বাংলাদেশ কৃষি বিশ্ববিদ্যালয়ে (বাকৃবি) 'পানি ব্যবস্থাপনার নীতি এবং বাস্তবায়নের কাঠামো তৈরি' শীর্ষক একটি কর্মশালা অনুষ্ঠিত হয়েছে। ইন্টারন্যাশনাল ইউনিয়ন ফর কনজারভেশন অব নেচারের (আইইউসিএন) আয়োজনে সোমবার বিকেল ৪ টার দিকে কৃষি অনুষদের সম্মেলন কক্ষে ওই কর্মশালার আয়োজন করা হয়। কর্মশালায় সহযোগিতা করে জাতিসংঘের খাদ্য ও কৃষি সংস্থা (এফএও)।

কর্মশালায় মাটির ক্ষয়রোধ নিয়ন্ত্রণ, উর্বরতা বৃদ্ধি, মাটির স্বাস্থ্যরক্ষা, পানির স্তর নিয়ন্ত্রণ, মাটি ও পানির যথাযথ ব্যবহার নিশ্চিতকরণ, ইটের ভাটার দূষণ রোধ, পরিবেশ সংরক্ষণ আইন নিশ্চিতকরণে ওই কর্মশালায় দেশের বিভিন্ন সরকারি ও বেসরকারি প্রতিষ্ঠানের প্রায় অর্ধশত কর্মকর্তা অংশগ্রহণ করেন।

কর্মশালায় স্বাগত বক্তব্য ও প্রবন্ধ উপস্থাপন করেন ইন্টারন্যাশনাল ইউনিয়ন ফর কনজারভেশন অব নেচারের (আইইউসিএন) সিনিয়র প্রোগাম অফিসার এ বি এম সারোয়ার আলম। এরপর উপস্থিত অতিথিরা একটি দলগত আলোচনায় অংশ নেন। দলগত আলোচনায় সঞ্চালনার দায়িত্ব পালন ও সমাপনী বক্তব্য রাখেন বাংলাদেশ কৃষি বিশ্ববিদ্যালয়ের মৃত্তিকা বিজ্ঞান বিভাগের অধ্যাপক ড. মো. আনোয়ারুল আবেদীন।