

Training report on Monitoring and analysis of Non-Point Source of Pollution (NPS) – Agriculture in a Riverine System

Back ground:

As per the office order No.B-13011/NIH-Roorkee/ ETU/2011 dated September 09, 2014, the undersigned attended the 3 day training on “Monitoring and analysis of Non-Point Source of Pollution (NPS) – Agriculture in a Riverine System ” organised by National Institute of Hydrology Roorkee during October 13 -15, 2014.

Programmes Covered :

Following are the programmes covered during the training programme.

October 13, 2014 (Monday)		
1	Registration and Inaugural Session	
2	Technical Session 1 : Water Quality Monitoring Planning	By C.K. Jain
3	Technical Session 2 : Non Point Source Pollution	By C. K. Jain
4	Technical Session 3 : Assessment of Point and Non-point Source of Pollution using chemical Mass Balance approach – Case Study River Kali	By C. K. Jain
5	Technical Session4: Application of Chemical Mass Balance Approach to Determine Sediment and Nutrient Loadings : Case Study river Ganga	By C.K. Jain
6	Technical Session 5 : Soil Erosion and Sediment yield Modelling	By J.V. Tyagi
7	Technical Session 6 : Creation of Spatial Data Base using RS & GIS	
October 14, 2014 (Tuesday)		
8	Laboratory visit	
9	Technical Session 7 : SWAT – A Tool for Basin Hydrology and Non Point Source Pollution Modelling	By J. V. Tyagi
10	Site Seeing – visit to Haridwar	
October 15, 2014 (Wednesday)		
11	Technical Session 8: Status and Strategies for Management of Water Resources in India	Er. R.D. Singh
12	Technical Session 9 : Set up of SWAT Model (Procedure for set up))	By J. V. Tyagi
13	Technical Session 10 : Hands on Practice on SWAT Model	By J. V. Tyagi
14	Valedictory function : Participants expressed the experience gained in the training programme .	

Details of Technical sessions Held at NIH, Roorkee during October 13-15, 2014 :

1.0 Inaugural Session :

Dr. C. K. Jain, Scientist 'G' & Head, Environmental Hydrology Division, NIH, warmly welcomed the all participants at conference Hall of NIH, Roorkee and gave brief introduction about the training programme. Dr. S.K. Jain, Scientist 'F', Water Resources System Division gave the Inaugural address about the training programme. Dr. J. V. Tyagi, Scientist 'G', Surface Water Hydrology Division, gave Vote of thanks to CPCB, Resource personnel of the training programme and all participants.

2.0 Technical Session 1 : Water Quality Monitoring Planning

Dr. C. K. Jain, Scientist 'G' & Head, Environmental Hydrology Division, NIH gave power point presentation covering the following information's viz., Introduction, Water Quality Monitoring Planning, Objectives of the Monitoring Programme, Objectives of GEMS/Water, Selection of Sampling Locations, Quality Parameter of interest, Frequency and Time of Sampling, Major Water Quality issues, Water Scarcity, Oxygen Depletion, Pollution due to Urbanization, Non-point Source Pollution, Eutrophication, Salinity, Natural contaminants Pathogenic Pollution, Ecological Health, Ground Water Quality, common Ground Water Contaminants, Legal Consideration, Approach to water quality management and The Revised Approach.

3.0 Technical Session 2 : Non Point Source Pollution

Dr. C. K. Jain, Scientist 'G' & Head, Environmental Hydrology Division, NIH gave power point presentation covering the following information's, brief introduction about Non Point Source Pollution, Surface Water Problems, Pollution Control Measures, nutrient Control, Pesticides Control, Watershed Management Planning and concluded that Non point source pollution is world wide problem and it is responsible for contamination of both surface water as well as Ground water resources.

4.0 Technical Session 3 : Assessment of Point and Non-point Source of Pollution using chemical Mass Balance approach – Case Study River Kali

Dr. C. K. Jain, Scientist 'G' & Head, Environmental Hydrology Division, NIH gave power point presentation covering the following information's viz.,, brief introduction about Kali river basin, geographical features of study area, sources of point and non -point sources of pollutions in the basin, sampling stations, methodology adopted to estimate the pollution load, Indirect Measurement of Point Sources using Upstream/downstream river Water Quality Data, Mass balance to Upstream/Downstream River Water Quality Data and discussion on findings of the case study.

5.0 Technical Session 4 : Application of Chemical Mass Balance Approach to Determine Sediment and Nutrient Loadings : Case Study river Ganga

Dr. C. K. Jain, Scientist 'G' & Head, Environmental Hydrology Division, NIH gave power point presentation covering the following information's viz., brief introduction about Ganga river, stretch taken for study, geographical features of river stretch taken for study, selection of sampling stations, Methodology adopted for estimation of pollution load from non-point sources, information about land use pattern & fertiliser inputs, Flow Characteristics at selected point, Hydro-chemical characteristics at selected sampling points, estimation of sedimentation load, nutrient load, local and discussion on findings of the study.

6.0 Technical Session 5 : Soil Erosion and Sediment yield Modelling

Dr. J.V. Tyagi, Scientist 'G' , Surface Water Hydrology Division, NIH gave power point presentation covering the following information's viz., brief introduction about mechanics of soil erosion by water, different forms of soil erosion, Factors affecting erosion and sediment yield, Modelling Soil erosion and Sediment Yield, Remote Sensing & GIS for distributed Modelling, Estimation of spatial soil erosion using GIS - A USLE Approach, application of USLE, estimation of soil Loss per Land use type, Estimation of Temporal variations of Runoff and Sediment yield using GIS input with Answers model, Application of ANSWERS model for estimating the soil erosion and deposition in the Watershed Area.

7.0 Technical Session 6 : Creation of Spatial Data Base using RS & GIS

Dr. S.K. Jain, Scientist 'F' , Water Resources System Division, NIH gave power point presentation covering the following information's viz., information about Remote Sensing, Geographical Information System and Digital Elevation Model, Land use cover, Interpretation of remotely sensed Data for land use/ Land cover, Levels of classification using satellite data, comprehensive classification system Developed by NRSC, Ratio based approaches, NDVI approach, Accuracy Assessment and application of DEM, Land use and Land cover maps in Soil Water Analysis Tool model.

8.0 Laboratory visit : All participants were taken to CBRI water and air laboratory, Instrumentation section, R & D laboratory about recycling of wastes into building material.

9.0 Technical Session 7 : SWAT – A Tool for Basin Hydrology and Non Point Source Pollution Modelling

Dr. J.V. Tyagi, Scientist 'G' , Surface Water Hydrology Division, NIH gave power point presentation covering the following information's viz., Over view of SWAT, components of SWAT model like land phase of hydrologic cycle, weather, precipitation, solar radiation & air temperature, relative humidity, wind speed, snow

cover and snow melt, soil temperature, hydrology, Infiltration and surface runoff, percolation, Evapotranspiration, Lateral subsurface flow, Ground water flow, transmission loss, ponds, erosion and sediment yield, Nutrients & pesticides, crop Growth, agricultural management, Routing phase of hydrologic cycle and routing in the reservoir were discussed .

9.0 Technical Session 8 : Status and Strategies for Management of Water Resources in India

Er. R.D. Singh Singh, Director , NIH Roorkee gave power point presentation covering the following topics viz., Status of surface and Ground Water resources, surface water resources, ground water resources, Water requirement for domestic use, Irrigation, Hydroelectric power generation, Industrial use, Strategies for Management of surface and Ground water Resources, Flood Management, Drought Management, Inter - basin Water Transfer, Groundwater management, Conjunctive use of surface and groundwater, efficient irrigation management, Watershed management, Water conservation, water quality conservation and Environment restoration, recycle and reuse of water, effects due to climate change & adaptation of strategies, Legal restriction on water use, Desalination of water, Data monitoring and information system, application of decision support system in water resources, People participation & capacity building, Recent initiatives in water resources planning & management.

10.0 Technical Session 9 : Set up of SWAT Model (Procedure for set up)

Dr. J.V. Tyagi, Scientist 'G' , Surface Water Hydrology Division, NIH gave power point presentation on steps to be followed for running the SWAT model by using existing input data of NIH.

11.0 Technical Session 10 : Hands on Practice on SWAT Model

All participants were taken to their computer division and given opportunity to run SWAT model individually by using existing input data of NIH to estimate the total runoff, sediment yield, nutrition load etc.

Overall view about training programme on the topic :

- The experience of resource personnel of NIH was found excellent.
- The duration allotted to this training programme is found inadequate, because it includes theory and estimation by using model.
- In training programme all participants expressed that no SPCB's initiated to estimate the pollution load due to non -point sources due to non-awareness about the procedure to be adopted.
- The participants gained more on theoretical knowledge about different monitoring & estimation techniques of non-point source pollution.

- The time given for session on application of Chemical Mass Balance approach to determine sediment and nutrient, creation of data base, land use land cover & DEM and Hands on Practice on SWAT Model was found very less since it is new to all.
- Due to less time given for Hands on practice on SWAT model the training programme is partially full fill the objective of the programme. If training programme includes following programmes, it will be very use full to officers for better understanding;
 - ✓ The duration of the training programme may be increased from 3 days to 5 days.
 - ✓ The time given for visiting to laboratories and general theoretical class may be reduce, more time may be given to main topics viz components of non- point source pollution, input data collection, monitoring and analysis of data, techniques used to interpret the data or estimation of pollution load from non-point sources.
 - ✓ More time may be given to session on Remote sensing, GIS creation of data base, land use/land cover for better understanding of user friendly software involved.
 - ✓ Extending opportunity to visualise the creation of input files including data on precipitation, radiation, wind data, temperature data etc., down loading of different maps (DEM, Land use, Land cover) from different satellite sites and make it to use for run the model.
 - ✓ Organising at least one Hands on practise on SWAT model by creating input data file and using those data for run the model provides practical experience.

(H.D. Varalaxmi)
Sc. D/ SEE

Tech-61/Training/NIH/ZOB/2014-15/

October 22, 2014

To

The Member Secretary
Central Pollution Control Board
Parivesh Bhawan,
East Arjun Nagar,
Delhi-110 032

Kind Attention : Incharge ETU division

Sub: Training report on Monitoring and analysis of Non-Point Source of Pollution (NPS) – Agriculture in a Riverine System

Ref: H.O officer order No. No.B-13011/NIH-Roorkee/ ETU/2011 dated September 09, 2014

Sir,

As per H.O. office order dated September 09, 2014, Mrs H.D. Varalaxmi, Scientist 'D' attended the training programme on Monitoring and analysis of Non-Point Source of Pollution (NPS) – Agriculture in a Riverine System at NIH, Roorkee during October 13-15, 2014. The report on training programme is enclosed for kind perusal please.

Yours faithfully,

Encl : As above

(S. Suresh)
Zonal Officer

