

**Practical Manual**  
**on**  
**Environmental Studies and**  
**Disaster Management**

**ABB 253 3(2+1)**  
**FNR 216 3(2+1)**

**Dr. Gunjan Guleria**  
**Dr. Pavan Kumar**  
**Dr. J. A. Bhat**  
**Dr. Vinod Kumar**

**2020**



**College of Agriculture**  
**Rani Lakshmi Bai Central Agricultural University**  
**Jhansi-284003**

**Syllabus ABB 253 3(2+1) and FNR 216 3(2+1):**

Pollution case studies. Case Studies- Field work: Visit to a local area to document environmental assets river/ forest/ grassland/ hill/ mountain, visit to a local polluted site-Urban/ Rural/ Industrial/ Agricultural, Study and documentation of common plants, insects, birds and study of simple ecosystems-pond, river, hill slopes, etc.

**Name of Student**.....

**Roll No.** .....

**Batch**.....

**Session**.....

**Semester**.....

**Course Name:** .....

**Course No. :** .....

**Credit**.....

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**CERTIFICATE**

This is to certify that Shri./Km. ....ID  
No.....has completed the practical of  
course.....course No. .... as per the  
syllabus of B.Sc. (Hons.) Forestry ..... semester in the year.....in the respective lab/field of  
College.

Date:

Course Teacher

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5	Visit to a local area to document environmental assets grassland	
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7	Visit to a local area to document environmental assets mountain	
8	Visit to a local polluted site-Urban	
9	Visit to a local polluted site-Rural	
10	Visit to a local polluted site-Agricultural.	
11	Study and documentation of common plants	
12	Study and documentation of local insects.	
13	Study and documentation of local birds	
14	Study of simple ecosystems-pond	
15	Study of rive	
16	Study of hill slopes	

**Practical No. 1**

**Objective: To learn case study of NO<sub>2</sub> pollution**

**Material required:**.....  
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**Data download (SPCB):**.....  
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Sample Location	2000 (NO <sub>2</sub> )	2010 (NO <sub>2</sub> )	2020 (NO <sub>2</sub> )

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**Modeller:**.....  
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**Objective: To learn case study of SO<sub>2</sub> pollution.**

**Material required:**.....  
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**Data download (SPCB):**.....  
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Sample Location	2000 (SO <sub>2</sub> )	2010 (SO <sub>2</sub> )	2020 (SO <sub>2</sub> )

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**Modeller:**.....  
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**Practical No. 3**

**Objective:** To visit a local area to document environmental assets river.

**Material required:**.....  
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**Sample collection:**.....  
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Sample Location	LAT	LONG

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**Observation:**.....  
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Location/WQI Parameter				
Sample Location 1				
Sample Location 2				
Sample Location 3				
Sample Location 4				
Sample Location 5				
Sample Location 6				
Sample Location 7				

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**Discussion:**.....  
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**Conclusion:**.....  
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Practical No. 4

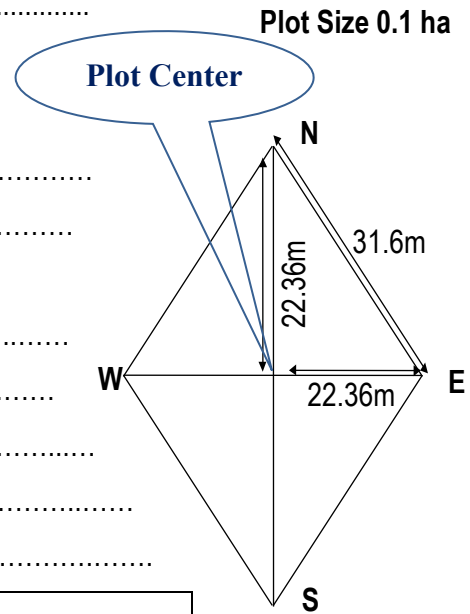
Objective: To visit a local area to document environmental assets forest.

Material required: .....  
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Procedure: .....  
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Layout plot design: .....

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S. No.	Plot No.	Species Name

Discussion: .....

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**Objective:** To visit a local area to document environmental assets hill.

**Material required:** .....

**Identify the type of hill:**.....

**Qualitative aspects observations:**.....

**Discussion:**.....

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**Conclusion:**.....

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**Practical No. 7**

**Objective: To visit a local area to document environmental assets mountain.**

**Material required:** .....  
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**Identify the type of hill:**.....  
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**Qualitative aspects observations:**.....  
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**Discussion:**.....  
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**Conclusion:**.....  
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**Objective: To visit a local polluted site-Rural.**

**Material required:** .....  
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**Type of pollution:**.....  
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**To find out the problems faced by people living near the polluted site:**.....

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**Summary, conclusion and suggestion:**.....

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**Objective:** To study and document common plants.

**Material required:** .....

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**Procedure:**.....

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**Observations:**.....

S. No.	Common Name	Botanical Name	Family	Habit	Major Identification Features
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**Used of medicinal plant:**.....

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Location of plant:.....  
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Species Name	LAT	LONG

Conclusion:.....  
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**Suggestions:**

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**Objective:** To study and document local insects.

**Material required:** .....  
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**Type of local insects:**.....  
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**Beneficial roles of insects for nature and humans:**.....  
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**Summary:**.....  
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**Conclusion:**.....  
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**Suggestions:**.....  
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**Objective: To study and document local birds.**

**Material required:** .....  
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**Type of birds:**.....  
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**Beneficial roles of birds for nature and humans:**.....  
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**Conclusion:**.....  
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**Conclusion:**.....

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**Suggestions:**.....

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**Objective:** To study hill slopes.

**Material required:** .....

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**Procedure:**.....

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## NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) INDEX

Pollutant	Time Weighted Average	Concentration in Ambient Air	
		Industrial, Residential, Rural, and Other Areas	Ecologically Sensitive Area (notified by Central Government)
Sulphur dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	Annual 24 hours	50	20
		80	80
Nitrogen dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	Annual 24 hours	40	30
		80	80
Particulate matter (< 10 µm) or PM <sub>10</sub> , µg/m <sup>3</sup>	Annual 24 hours	60	60
		100	100
Particulate matter (< 2.5 µm) or PM <sub>2.5</sub> , µg/m <sup>3</sup>	Annual 24 hours	40	40
		60	60
Ozone (O <sub>3</sub> ), µg/m <sup>3</sup>	8 hours 1 hour	100	100
		180	180
Lead (Pb), µg/m <sup>3</sup>	Annual 24 hours	0.50	0.50
		1.0	1.0
Carbon monoxide (CO), mg/m <sup>3</sup>	8 hours 1 hour	02	02
		04	04
Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	Annual 24 hours	100	100
		400	400
Benzene (C <sub>6</sub> H <sub>6</sub> ), µg/m <sup>3</sup>	Annual	05	05
Benzo(a)Pyrene (BaP) – particulate phase only, ng/m <sup>3</sup>	Annual	01	01
Arsenic (As), ng/m <sup>3</sup>	Annual	06	06
Nickel (Ni), ng/m <sup>3</sup>	Annual	20	20

## BIO-GEOGRAPHIC ZONES IN INDIA

Biogeographic Zone	Percentage of land mass of the country	Location and description
Trans-Himalayas	5.7	An extension of the Tibetan plateau, harboring high-altitude cold desert in Laddakh (J&K) and Lahaul Spiti (H.P).
Himalayas	7.2	The entire mountain chain running from north west to north eastern India, comprising a diverse range of biotic provinces and biomes.
Desert	6.9	The extremely arid area, west of the Aravalli hill range, comprising of both the salty desert of Gujarat and the sand desert of Rajasthan.
Semi-arid	15.6	The zone between the desert and the Deccan plateau, including the Aravalli hill range.
Western Ghats	5.8	The hill ranges and plains running along the western coastline, south of the Tapti river, covering an extremely diverse range of biotic provinces and biomes.
Deccan Peninsula	43	The largest of the zones, covering much of the southern and south-central plateau with predominantly deciduous vegetation.
Gangetic plain	11	Defined by the Ganges river system, these plains are relatively homogenous.
North-East India	5.2	The plains and non-Himalayan hill ranges of north eastern India, with a wide variation of vegetation.
Islands	0.03	The Andaman and Nicobar Islands in the Bay of Bengal and Lakshadweep islands with a highly diverse set of biomes.
Coasts	Negligible	A large coastline distributed both to the west and east, with distinct differences between the two.

## DISTRIBUTION OF NATURAL VEGETATION TYPES IN INDIA



### LEGEND

<input type="checkbox"/>	Alpine & Sub Alpine	<input type="checkbox"/>	Cold Desert	<input type="checkbox"/>	Desert Soil
<input type="checkbox"/>	Himalayan dry temperate	<input type="checkbox"/>	Himalayan moist temperate	<input type="checkbox"/>	Hot desert
<input type="checkbox"/>	Montane wet temperate	<input type="checkbox"/>	Sub tropical coniferous	<input type="checkbox"/>	Tropical dry deciduous
<input type="checkbox"/>	Tropical moist deciduous	<input type="checkbox"/>	Tropical semi evergreen	<input type="checkbox"/>	Tropical thorny vegetation
<input type="checkbox"/>	Tropical wet evergreen				

## Drinking Water Quality as Prescribed by BIS

Constituent	Unit	Drinking water quality standards
PH		6.5-8.5
Total Dissolved solid	mg/l (Max)	500
Electric Conductivity at 25°C	micromho/cm (Max)	-
Alkalinity as CaCO <sub>3</sub>	mg/l (Max)	200
Total hardness as CaCO <sub>3</sub>	mg/l (Max)	300
Calcium (Ca)	mg/l (Max)	75.00
Magnesium (Mg)	mg/l (Max)	30.00
Iron (Fe)	mg/l (Max)	0.30
Free Ammonia (NH <sub>4</sub> )	mg/l (Max)	-
Chloride (Cl)	mg/l (Max)	250.00
Fluoride (F)	mg/l (Max)	1.00
Sulphate (SO <sub>4</sub> )	mg/l (Max)	200.00
Nitrate (NO <sub>3</sub> )	mg/l (Max)	45.00
Dissolved Oxygen (DO)	mg/l (Max)	6.00
Biochemical Oxygen Demand (BOD)	mg/l (Max)	2.00
Arsenic (As)	mg/l (Max.)	0.01
Boron (B)	mg/l (Max.)	0.3
Cadmium (Cd)	mg/l (Max.)	0.003
Chromium (Cr)	mg/l (Max.)	0.05
Copper (Cu)	mg/l (Max.)	0.05
Cyanide (Cn)	mg/l (Max.)	0.05
Lead (Pb)	mg/l (Max.)	0.01
Manganese (Mn)	mg/l (Max.)	0.05
Mercury (Hg)	mg/l (Max.)	0.001
Zinc (Zn)	mg/l (Max.)	5.00
Phenolic Compounds (C <sub>6</sub> H <sub>5</sub> OH)	mg/l (Max.)	0.001
<b>Total Hardness (CaCO<sub>3</sub>)</b>	<b>mg/l (Max.)</b>	<b>300.00</b>
Sodium Percentage	(Max.)	-
Sodium Absorption Ratio (SAR)	(Max.)	-