ENVIS Resource Partner (RP) on "Plants and Pollution"

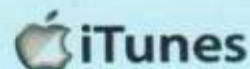## CSIR-National Botanical Research Institute, Lucknow

Sponsored by Ministry of Environment, Forest & Climate Change, Government of India

The Environmental Information System- Resource Partner (ENVIS-RP) at CSIR-National Botanical Research Institute is focused on the theme of **"Plants and Pollution".** The RP has started functioning as ENVIS Centre in January 2005. ENVIS-RP-NBRI sysmatically collects, compiles and disseminates data on diverse aspects of **"Plants and Pollution"** together, which is providing data of immense use to several research organizations, town planners, policy makers, teachers, students and other stakeholders. ENVIS- RP-NBRI covers national and international scientific data on all kinds of pollution with reference to plant kingdom. The data include effects of different pollutants on plant kingdom, and how plant resources can be used to mitigate specific pollutants. There are 35 Resource Partners (RPs) and 31 Hubs are working under the aegis of ENVIS across the country.

Website Home Page

ENVIS RP-NBRI GREEN PLANNER

Google Play   GREEN PLANNER   iTunes

PLANTS FOR AIR POLLUTION CONTROL

The **"Green Planner"** is a database to provide information on different plants mitigating air pollution. These plants can be planted on roadside, road-dividers, in the greenbelts, and in indoor premises. The plantation of such locally suitable and pollutant specific mitigant plants will help to ameliorate the deleterious effects of different air pollutants from industrial emissions, vehicular exhausts, and indoor premises. The plant list in the Green Planner App provides the botanical and common names of pollution tolerant and mitigant plants, their distribution in India and suitable planting sites, along with their economic and ecological benefits as well as other relevant information. The Android and iTunes mobile applications, namely, **"Green Planner"** have also been released for its wider use by different stakeholders. The user can download it from the "Google Play Store" and iTunes Store free of cost by login.

ENVIS RP-NBRI DATABASE

Database

Endosulfan

Endosulfan is a persistent, toxic broad-spectrum organochlorine insecticide and acaricide used on food and non-food crops. To overcome the problem of hydrophobicity of endosulfan, surfactants play a major role in soil remediation.

Remediation of Endosulfan

Remediation of endosulfan in water using different aquatic plants showed that Salvinia molesta is more efficient in endosulfan removal.

References and Numerical data

References

Numerical data

34 Database

> **Heavy Metals**
- Nickel
- Chromium
- Cadmium
- Copper
- Lead
- Mercury
- Arsenic
- Zinc
- Iron
- Metal/Metalloid

> **Pesticides**
- Endosulfan
- Lindane
- Neonicotinoids
- Organophosphate
- Carbofurans
- Nitrogen Fertilizer

> **Gases**
- Ozone
- Fluoride
- Biogas
- Green House Gases
- Sulphur dioxide
- Nitrogen Oxides
- Carbon Monoxide
- Hydrocarbon

> **Suspended Particulate Matter**

> **Bioremediation**

> **Indoor Air Pollutants**

> **Nanoparticle**

> **Acid Rain**

> **Smog**

> **Waste Land Management Through Plants**

> **Climate Change**

- Role of Plants in CO_2 Sequestration
- Climate Change - CO_2 Enrichment
- Climate Change-Methane

Indoor Air Pollutants

It refers to the physical, chemical, and biological characteristics of air in the indoor environment within a home, building, or an institution or commercial facility. Indoor air pollution is a concern in the developed countries, where energy efficiency improvements sometimes make houses relatively airtight, reducing ventilation and raising pollutant levels. Indoor air problems can be subtle and do not always produce easily recognized impacts on health. Different conditions are responsible for indoor air pollution in the rural areas and the urban areas. The levels of pollutants in the air inside homes, schools, and other buildings can be higher than the level of pollutants in the outdoor air. Indoor air pollution comprises a mixture of contaminants penetrating from outdoors and those generated indoors.

Indoor Plants

1. **Bamboo Palm:** According to NASA, it removes formaldahyde and is also said to act as a natural humidifier.
2. **Snake Plant:** Found by NASA to absorb nitrogen oxides and formaldahyde.
3. **Areca Palm:** One of the best air purifying plants for general air cleanliness.
4. **Spider Plant:** Great indoor plant for removing carbon monoxide and other toxins or impurities. Spider plant are one of three plants NASA deems best at removing formaldahyde from the air.
5. **Peace Lily:** Peace lilies could be called the "clean-all". They are often placed in bathrooms or laundry rooms because they are known for removing mold spores. Also known to remove formaldahyde and trichoroethylene.
6. **Gerbera Daisy:** These beautiful flowers remove benzene from the air as well as known to improve sleep by absorbing carbon dioxide and giving off more oxygen over night.

ENVIS RP-NBRI PUBLICATIONS & OUTREACH

Newsletters (Quarterly) | Case Study (Annual) | Bibliography (Annual)

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Green Skill Development Programme

Most vocational training programmes focus on mechanical/technical skills rather than 'soft' or 'green' skills. Green skills contribute to preserving or restoring environmental quality for sustainable future and include jobs that protect ecosystems and biodiversity, reduce energy and minimize waste and pollution. In line with the Skill India Mission of Hon'ble Prime Minister, Ministry of Environment, Forest & Climate Change (MoEF&CC) utilising the vast network and expertise of ENVIS Hubs/RPs, has taken up an initiative for skill development in the environment and forest sector to enable India's youth to get gainful employment and/or self-employment, called the Green Skill Development Programme (GSDP). The course has been approved as per NSQF guidelines and endorsed as a national NSQF Level 6 course.

GSDP Online Portal

http://www.gsdp-envis.gov.in/

GSDP Brochure

GSDP Programme on
Pollution Monitoring: Soil Pollution

The modules of the course includes the theoretical, practical hands-on training, and field visits at the sites. The need of such programme on Soil Pollution is for imparting skills on soil pollution monitoring, assessment and remediation. The programme is of 200 hrs. The programme aims to provide master trainers in the specific area of soil pollution monitoring. The faculty members are from CSIR-NBRI, CSIR-IITR, ICAR-IISR, and ICAR-CSSRI (RS), Lucknow.

Course Modules
"Pollution Monitoring: Soil Pollution"

➤ Introduction
➤ Soil Pollution
➤ Soil quality & its relation to human health
➤ Soil sampling & Procedures
➤ Soil Properties
  - Physical Properties
  - Chemical Properties
  - Biological Properties
➤ Analysis of soil data, Grid-based study and Geo-tagging
➤ Soil quality assessment
➤ Mitigation of soil pollution

GSDP Programme on
Greenbelt Development for Industries

Keeping in view of the regulatory requirement to establish Scientific Greenbelt, a Greenbelt Development for Industries course has been approved Greenbelt can absorb air pollutants from the ambient air and help in effective pollution control. Green belts are planned open spaces safeguard the developmental and industrial activities such as construction of buildings, industries, dams, etc.

Course Modules
"Greenbelt Development for Industries"

➤ Greenbelt and its significance
➤ Plants and mechanisms of air pollutant mitigation
➤ Selection of Air Pollution Mitigant Plants
➤ Nursery and Propagation
➤ Modelling of Greenbelt & Plantation design

About 1ˢᵗ Programme of GSDP "Pollution Monitoring: Soil Pollution"

In the first GSDP programme of CSIR-NBRI on the topic 'Pollution Monitoring: Soil Pollution", A total of 107 candidates have been applied for the course online and they were screened by the Advisory Committee of GSDP-NBRI. The members of the Advisory Committee are from NTPC, Hindalco, CPCB, UPPCB, UP Forest Department, Ganga River Conservation Authority, U.P. and CSIR-NBRI. After screening, 30 candidates were called for the course and 16 have been registered for the course. 13 candidates successfully completed the course and awarded with the certificates.

Media Coverage

Glimpses of the Course