



**MANAV RACHNA
UNIVERSITY**

Declared as State Private University vide Haryana Act 26 of 2014



15 LIFE ON LAND



PROGRESS REPORT 2022-23

Manav Rachna University

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1. Preamble

Sustainable Development Goal 15 (SDG 15) aims to "protect, restore, and promote the sustainable use of terrestrial ecosystems, manage forests sustainably, combat desertification, halt and reverse land degradation, and halt biodiversity loss." This goal focuses on ensuring the health and preservation of land ecosystems, which are critical for maintaining biodiversity, securing livelihoods, and mitigating climate change. Life on land includes the preservation of forests, wetlands, grasslands, and deserts, which all provide essential resources for food, water, and shelter.

Current Scenario on Life on Land

The current state of life on land is concerning, as human activities have led to the depletion and degradation of terrestrial ecosystems. Deforestation, primarily driven by agriculture, logging, and urbanization, has reduced biodiversity and disrupted ecosystems across the globe. Nearly 10 million hectares of forest are lost annually, contributing to climate change by releasing stored carbon into the atmosphere. Similarly, land degradation and desertification are



escalating, with around 25% of the world's land area being affected. This is largely due to unsustainable agricultural practices, overgrazing, and deforestation, which have led to soil erosion, decreased fertility, and reduced food security.

Biodiversity is under severe threat, with around 1 million species at risk of extinction due to habitat loss, pollution, and climate change. Additionally, wetlands, which play a critical role in water purification and carbon storage, are being drained for agriculture and urban development. The decline in biodiversity and the degradation of ecosystems not only threaten wildlife but also impact human health, livelihoods, and economic stability, particularly in rural areas that depend on healthy ecosystems for resources.



2. Challenges in Achieving Life on Land

- A. **Deforestation and Habitat Loss:** The ongoing loss of forests due to logging, agriculture, and infrastructure development continues to be a major challenge. Forests are critical for biodiversity, carbon sequestration, and providing livelihoods for millions of people.
- B. **Land Degradation and Desertification:** Unsustainable agricultural practices, overgrazing, and urban expansion are major contributors to land degradation and desertification. This results in reduced soil fertility, loss of arable land, and reduced agricultural productivity.
- C. **Biodiversity Loss:** The rapid loss of species due to habitat destruction, poaching, climate change, and pollution is putting global biodiversity at risk. This loss disrupts ecosystems and threatens food security and human well-being.
- D. **Pollution and Overexploitation of Resources:** Pollution from plastics, chemicals, and waste is harming terrestrial ecosystems.



Overexploitation of resources, such as overfishing, mining, and excessive water use, leads to depletion of critical ecosystems and natural resources.

Strategies and Interventions

- **Sustainable Land Management:** Promoting sustainable agricultural practices such as agroforestry, crop rotation, and organic farming to preserve soil health and prevent land degradation.
- **Reforestation and Afforestation:** Large-scale tree planting initiatives and forest restoration programs to halt deforestation, rebuild ecosystems, and absorb carbon emissions.
- **Biodiversity Conservation:** Strengthening protected areas, wildlife corridors, and conservation programs to safeguard endangered species and restore habitats.
- **Ecosystem Restoration:** Implementing restoration projects that focus on repairing degraded ecosystems, such as wetlands, grasslands, and forests, to enhance biodiversity and ecosystem services.



3. Initiatives by MRCPS towards

SDG 15

On October 19, 2023, the Manav Rachna Centre for Peace and Sustainability organized a Scavenger Hunt on the Central Lawn, engaging 20 participants in an interactive exploration of biodiversity while promoting mental well-being. As part of 'Project Khushi,' aligned with the United Nations SDG 3 (Good Health and Well-being), the event aimed to foster mental health awareness through fun activities. By integrating games with discussions on mental health, MRCPS demonstrated its commitment to improving public health and creating a positive impact on the community's well-being.



4. Research Publications

Study of Magnetic Field Evolution by Weibel Instability in Counter-Streaming Electron-Positron Plasma Flows

This research delves into the formation of collisionless shocks in astrophysical systems, focusing on the role of Weibel instability in amplifying magnetic fields. The study employs particle-in-cell (PIC) simulations to compare the magnetic field amplification in both homogeneous and inhomogeneous counter-streaming electron-positron plasma flows.

In homogeneous flows, the magnetic field initially grows exponentially due to Weibel instability but subsequently decays after reaching saturation. However, in inhomogeneous flows, a unique behavior emerges. The magnetic field re-amplifies in the post-saturation region due to density fluctuations and temperature anisotropy in the upstream plasma. This research provides valuable insights into the formation and evolution of collisionless shocks in astrophysical environments like gamma-ray bursts, emphasizing the importance of considering inhomogeneities in plasma distribution.



5. Books /Book Chapters

Biology and Management of *Ustilagoidea virens* Causing False Smut Disease of Rice (*Oryza sativa* L.)

False smut disease, a significant threat to rice cultivation, is caused by the fungus *Ustilagoidea virens*. This fungus infects rice plants during the flowering stage, replacing the developing grains with dark, powdery spore masses.

To manage this disease, a combination of strategies is employed. These include cultural practices like using disease-free seeds, crop rotation, and deep plowing to reduce fungal inoculum. Biological control agents, such as *Trichoderma* species, can also be applied to suppress the fungus. Chemical control, involving the use of fungicides like Carbendazim and Tricyclazole, is another effective method. By implementing these integrated management practices, farmers can effectively control false smut disease and protect their rice crops.



6. Training/workshop

FDP on "Emotional Intelligence" conducted by ICT Academy at MRU

Manav Rachna University, Faridabad, actively participated in a 10-hour online Faculty Development Program on Emotional Intelligence, conducted by the ICT Academy from October 9th to 14th, 2023. This program aimed to equip faculty members with the essential skills to understand, manage, and utilize emotions effectively. By enhancing their emotional intelligence, faculty members can foster positive learning environments, improve communication, and build stronger relationships with students. This initiative aligns with the university's commitment to holistic faculty development and underscores the importance of emotional intelligence in contemporary education.

7. Other

I. SustainEd - Education for Sustainable Development Program



(ESDP)

The greatest threat to our planet is the belief that someone else will save it.” – Robert Swan. This quote underscores the purpose

behind SustainEd, the Education for Sustainable Development Program (ESDP) by Manav Rachna University, which seeks to empower youth as ambassadors of sustainability. The program aims to prepare university students to become sustainable citizens, instilling a lifelong commitment to environmental stewardship.

Through a curriculum aligned with the United Nations Sustainable Development Goals (SDGs), ESDP offers value-added courses that integrate sustainability across university departments. Notably,

the course "Essentials for Sustainability," powered by OER and UNESCO, is open to university students across India, encouraging a broad base of enrollment. Weekly awareness programs, including webinars, seminars, expert sessions, competitions, and conferences, enrich students' understanding of sustainable practices. In advanced stages, students take on ambassador roles, promoting community sustainability through activities like Nukkad Natak performances, rallies, cleanliness drives, and creative competitions. Through these diverse efforts, ESDP nurtures students into global stewards of sustainability, committed to making an impact starting within their communities.



II. Bringing Butterflies Home

The Manav Rachna campus, with its rich biodiversity and suitable environment, has been monitored for butterfly populations over the last three years by the Bombay Natural History Society.

Currently, the campus hosts around 10-11 butterfly species,



indicating a strong foundation for supporting even more species through dedicated habitat

enhancement. Establishing a Butterfly Garden on campus is expected to attract a greater diversity of butterflies, transforming the area into a small biodiversity hotspot.

Butterflies are highly sensitive organisms, making them natural indicators of air quality; the presence of various species can serve as a living monitor for the campus environment. Additionally, many butterfly larval host plants are medicinal, with some classified as endemic or endangered. This garden will not only

support butterflies but will also attract birds, honey bees, and other microfauna, fostering a thriving natural habitat. By situating the garden near Gate No. 3, adjacent to Block D, the campus takes a vital step toward becoming more eco-friendly and fostering a sustainable, educational experience for students and



III. Plantation drive at govt. schools

The Manav Rachna Green Warriors, in collaboration with Dr. OP Bhalla Foundation and Manav Rachna Centre for Peace and Sustainability, organized an Annual Mega Plantation Drive on August 27, 2022, at Government Schools in Nit 3 and Sirohi. The initiative aimed to increase green cover and raise awareness about environmental conservation.

The event involved the distribution of 3000 plants to various educational institutions and communities. Participants took a Green Oath, pledging their commitment to environmental protection. The drive successfully fostered a sense of environmental responsibility and inspired individuals to contribute to a greener future.



IV. Plantation drive at Mata Mandir

On August 16, 2024, a plantation drive was organized by Manav Rachna Centre for Peace and Sustainability (MRCPS) at Mata Mandir Chakreshwar Hari Parvat and Shiv Mandir Ankheer, Faridabad. The event aimed to improve the environment and

create a greener space for public relaxation. A team of four students, along with faculty members, planted a total of 25 trees at these locations. The initiative not only contributed to environmental conservation but also served as an opportunity for students to connect with nature and understand the importance of sustainable practices.



V. Plantation drive at MSC Public School, Faridabad

On August 8, 2024, Manav Rachna Centre for Peace and Sustainability (MRCPS) organized a plantation drive at MSC Public School, Faridabad. The event aimed to educate



young students about the importance of planting trees and environmental sustainability.



The initiative involved planting 10 trees and distributing 50 saplings among enthusiastic volunteers. The school

principal also participated in the event, further encouraging student involvement. This plantation drive not only contributed to a greener environment but also fostered a sense of environmental responsibility among the young generation. MRCPS continues to



organize such events to promote sustainable practices and create a better future.

