Dr. A.P.J. Abdul Kalam Young Research Fellowship By TERRE Policy Centre Vol.-8

"All of us do not have equal talent. But, all of us have an equal opportunity to develop our talents."

.... Dr. APJ Abdul Kalam

Dr. A.P.J. Abdul Kalam Young Research Fellowship

TERRE Policy Centre

Technology, Education, Research and Rehabilitation for the Environment

Leading platform for development through Alternate Path

APJ Abdul Kalam
Avul Pakir Jainulabdeen Abdul Kalam

A.P.J Abdul Kalam (15 October 1931 – 27 July 2015) was an Indian aerospace scientist and politician who served as the 11th President of India from 2002 to 2007. He was born and raised in Rameswaram, Tamil Nadu and studied physics and aerospace engineering. He spent the next four decades as a scientist and science administrator, mainly at the Defense Research and Development Organization (DRDO) and Indian Space Research Organization (ISRO) and was intimately involved in India's civilian space programme and military missile development efforts. He thus came to be known as the Missile Man of India for his work on the development of ballistic missile and launch vehicle technology. He also played a pivotal organizational, technical, and political role in India's Pokhran-II nuclear tests in 1998, the first since the original nuclear test by India in 1974.

Kalam was elected as the 11th President of India in 2002 with the support of both the ruling Bharatiya Janata Party and the then-opposition Indian National Congress. Widely referred to as the "People's President", he returned to his civilian life of education, writing and public service after a single term. He was a recipient of several prestigious awards, including the Bharat Ratna, India's highest civilian honour.

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About A.P.J Abdul Kalam Fellowship

TERRE has declared a national-level 'Young Research Fellowship' in the reverential memory of Dr. A.P.J. Abdul Kalam. Dr. Kalam had high expectations from the youth of India and keeping this in context, TERRE has announced this noble award on the occasion of Late Dr. Kalam's birth anniversary - 15 October 2024.

Academic qualification: Under-graduates, post-graduates, Ph.D. of any stream.

Age eligibility: Minimum 19 years and maximum 25 years of age (as on 01.01.2024)

Research themes: Plastic, Clean Air, Agriculture and Environment Friendly Technology & Innovation. .

Fellowship details: Young researchers who have worked or are working in the themes (as mentioned above) will be considered and up to 50 participants will be shortlisted for the fellowship. Innovative & unique idea will be awarded INR 25,000
Fellowship will be awarded on the remembrance day of Dr. Kalam i.e. 27th July 2026.

TERRE Policy Centre

TERRE Policy Centre is a not for profit, independent organisation based in Pune, Maharashtra, India. Established in the year 2010, TERRE is dedicated to sustainable solutions to our developmental imperatives. TERRE stands for Technology, Education, Research, and Rehabilitation for the Environment. Based on these unique aspects, we strive to reach all the strata of the society, particularly the young generation and the people at the bottom of the pyramid. Our organisation believes on practicing our preaches and to promote the changes that we want to see for our sustainable future.

Our Mission: "To provide credible information, straight answers, and innovative solutions in the efforts to address global environmental issues."

Our Motto: "To think is Good, but to act is Better".

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Dr. Vinita Apte
Founder Director
TERRE Policy Centre

Dr. Vinitaa a multifacets personality & founder of TERRE started this NGO with a motto "To think is good but to act is better". Dr. Apte has an out of the box thinking process and due to which she has started many different and innovative initiatives. She has developed more than 10 forestries on high mountain ranges through the PPP(Public Private Partnership)model. TERRE Policy Centre implemented a number of projects of Environmental Education, Solar Energy, Awards for innovation at the grassroots level under her able leadership. She implemented the projects on women & energy in rural India and empowered thousands of women. She has started the first-ever online Environmental olympiad to make digital India stronger and make aware the students at the early age. Women and youth empowerment are on the focus of TERRE.

Dr. Vinitaa Apte was consultant in United Nations Environment Programme, Paris as a communication expert and senior official and international expert on Sustainable Development and Green Economy. She successfully led a global team of Interns & consultants with diverse cultural background in UNEP's Paris office & in TERRE's office. Possesses hands on experience in forging innovative and award-winning partnerships with governments, NGOs and international organizations on critical issues of strengthening synergies and led a Programme on Sustainable livelihood in the World natural heritages. Strong facilitator and best communicator in consensus building at national and international platforms in difficult environmental negotiations. Renowned for creative concepts and practical programmatic approaches in developing, implementing, reporting and monitoring national strategies for ecosystem nurturing. Innovation led visionary at global as well as enterprise level in strengthening corporate social responsibility, community led nature conservation and restoration Status.

Activities Performed

- Developed 30 forestry on High Mountain ranges with the help of Public Private Partnership with the Survival rate of around 97%, More than 5,00,0000 trees are planted.
- Created Awareness among the more than 30,00,000 students through TERRE Olympiad, and encages them for environment protection
- Solve water problem of more than 5000 peoples in drought area.
- Lighted the more than 2000 households under the renewable energy programs
- Adopted 10 Villages for Community development, conducted different activities for their economic growth and good health
- Implemented may projected for waste management

Dr. A.P.J. Abdul Kalam Young Research Fellowship

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Ankit Singh

PG Diploma in Built Environment and Sustainability,
Anant National University, Ahmedabad

Project Title

Project Samman: Circular Economy Research for Dignified Access to Pre-Loved Goods in Urban Informal Settlements

Objective

To investigate why circular economy solutions fail to reach marginalised urban communities despite surplus availability, and to develop a dignity-centred distribution model that bridges the last mile between pre-loved goods and those who need them most.

Method

50-day mixed-methods field study across five Ahmedabad informal settlements: Ganeshnagar, Gyaspur, Malav Talav, Narmada Awas, and Gyatrinagar-Sarkhej. Data collected through 50+ semi-structured interviews, 46 household surveys, and 50+ hours of participant observation. Inductive thematic coding, qualitative-quantitative triangulation, and member-checks per site ensured research rigour. Field partner: India Recycles. Mentor: Prof. Risha Roy, Anant National University.

Outcome

Original research finding — the Dignity Variable: Purchase Likelihood = Affordability x Dignity. 83% of respondents ranked price first, but price alone never closed the sale. 72% required physical inspection before purchase. Goods displayed on the ground were labelled "daan ka saman" — charity — and caused dignity erosion; rack display doubled browse time. Daytime sale timing excluded 50% of working women. Environmental outcomes: 5,000+ kg waste diverted from landfill, 18 tonnes CO2 equivalent prevented, 3,000+ people empowered.

Conclusion

Circular economy solutions fail at the last mile not because of supply gaps but because of dignity gaps. When affordability and dignity are both present simultaneously, purchase likelihood increases measurably. When either is absent, the transaction collapses entirely. Dignity-centred circular models with fixed schedules, trust tags, dignified display, and women-led enterprise components are operationally viable and replicable across Indian urban informal settlements.

Implementation

- Community circular sales in informal settlements at flat rates of Rs 10 to Rs 120 with Amazon and Dmart as EPR surplus partners.
- Unsold goods converted into Revibe upcycled products and Godadi quilts made by women workers in settlements, with revenue distributed equally among them.

- Campus cause-loyalty sales converting college students from brand loyalty to cause loyalty.
- Piloting Sabka Bazzar — a 150 sq ft permanent community microsite model for scale.




Mohamed Abbas Mydeen **Lakshminarayanan L**

M. Tech. Leather and Footwear Technology (2nd year)
Alagappa College of Technology, Anna University, Chennai.

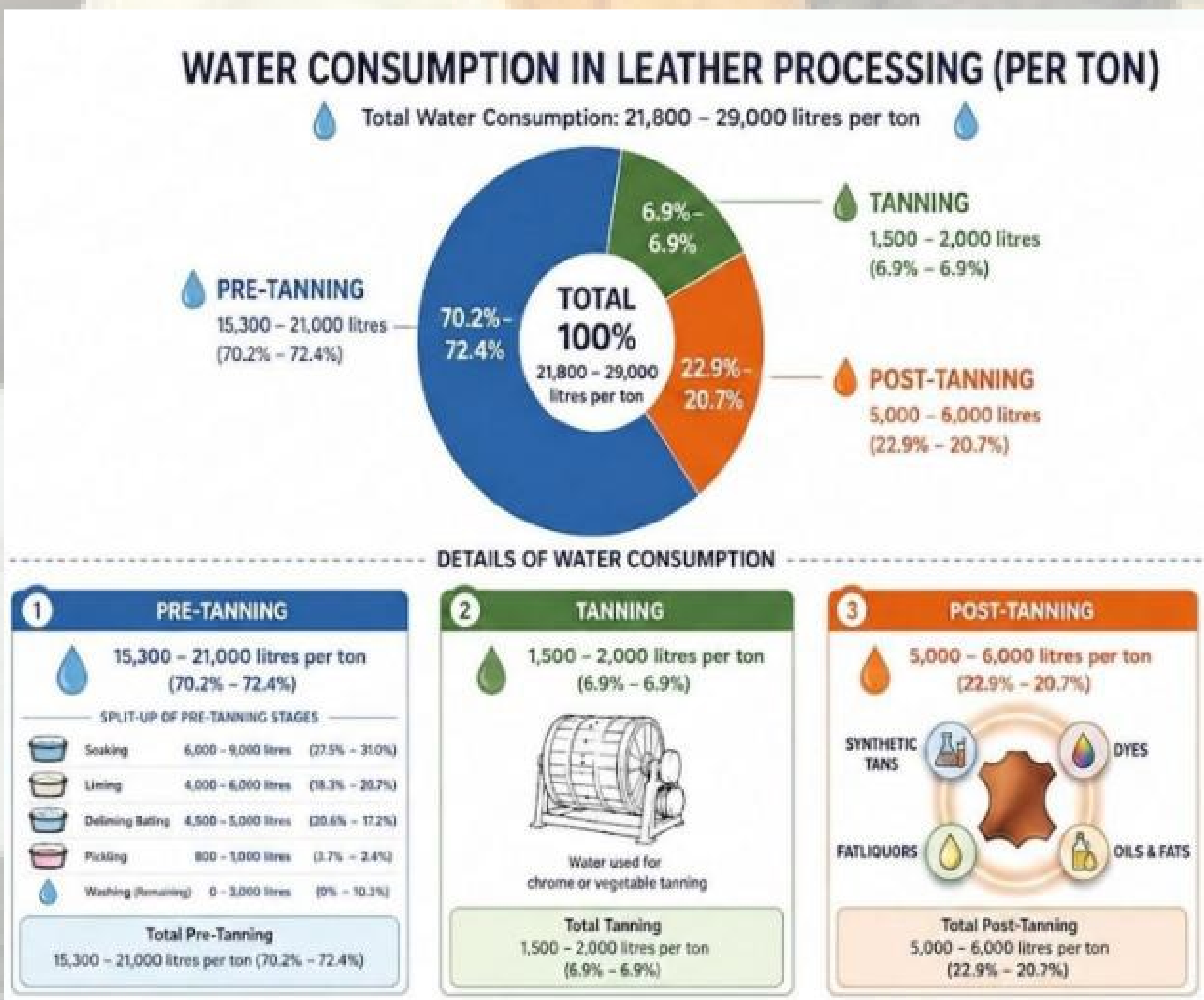
Project Title

Water-Smart Beamhouse Innovation: An Integrated Soaking–Liming Process for Sustainable Leather Manufacturing in Tamil Nadu

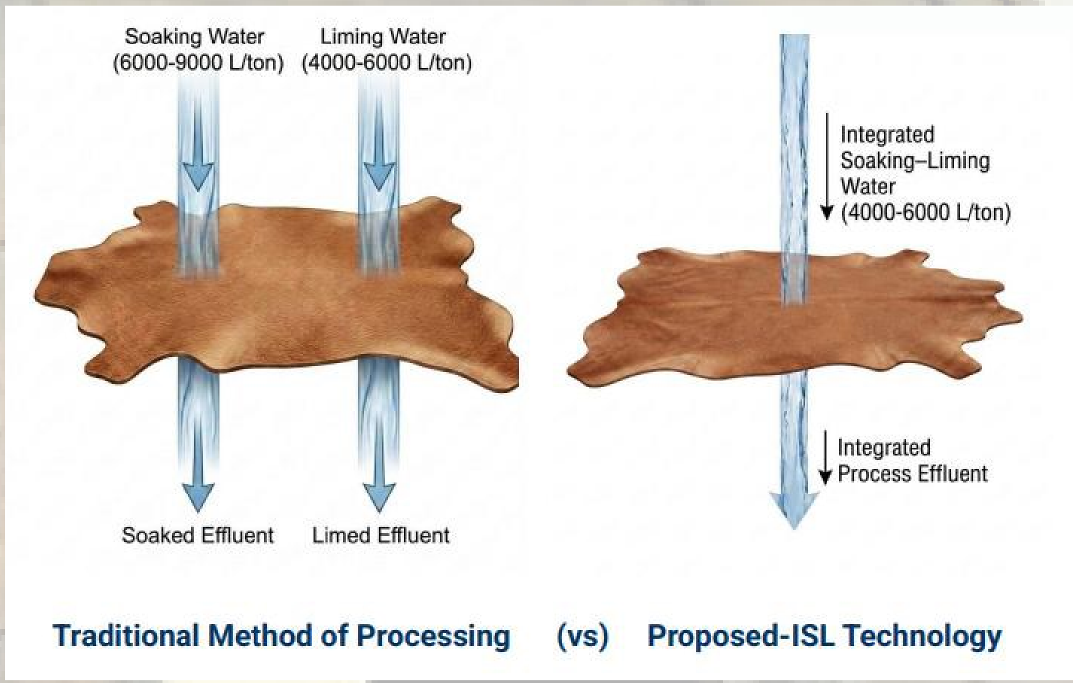
Objective

Development of integrated soaking-liming beamhouse process to minimize water, energy, and processing time without compromising leather quality for sustainable leather manufacturing in Tamil Nadu.

Overview

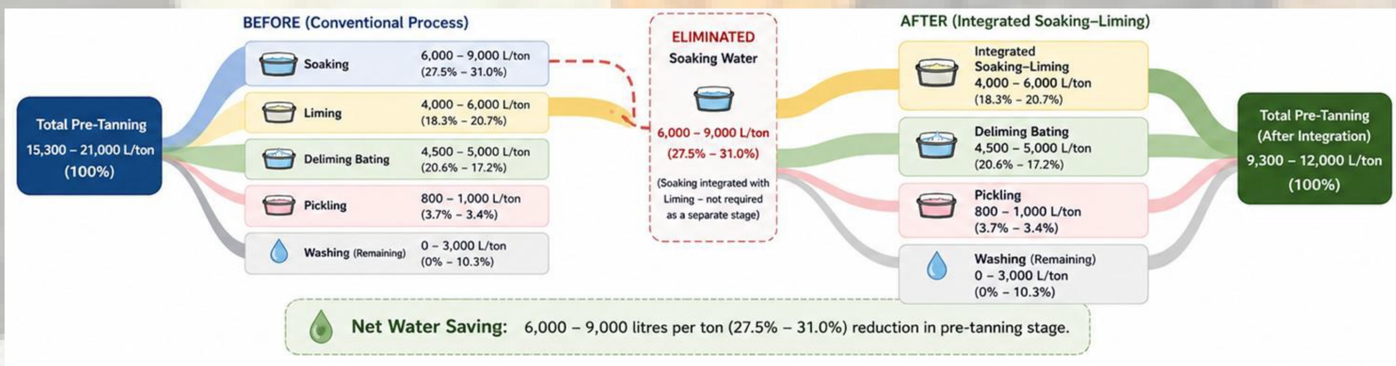


Methodology



Outcome

- Reduction in water consumption in beamhouse operations
- Improved control over fibre opening during liming
- Reduced cost of water and energy
- Shorter processing duration
- Reduced effluent generation
- Improved environmental compliance



Water Conservation: Sankey Diagram

Conclusion

The proposed integrated soaking–liming technology provides a practical, scalable solution to reduce the environmental footprint of beamhouse operations. The technology supports cleaner production, conserves freshwater resources, minimises wastewater generation, and contributes to sustainable leather manufacturing in line with SDGs 6, 9, 12 and Vision Tamil Nadu 2030.

Implementation

- Beamhouse units of leather manufacturing.
- Footwear manufacturing units



Raghav T S **Arvind Balaji M J** **Yabes P**

Student, Sathyabama Institute of Science and Technology

Project Title

Reuse of Treated Bathroom and Reverse Osmosis Membrane Waste Water Using Economical Water Filter

Objective

To reclaim domestic wastewater from bathroom and reverse osmosis sources using an economical physico-chemical treatment process, producing water suitable for safe non-potable reuse while conserving freshwater resources.

Method

Soap wastewater (SWW), toilet cleaner wastewater (TCWW), and reverse osmosis wastewater (ROWW) were collected separately. SWW–TCWW (3:1) and SWW–ROWW (1:1) mixtures underwent physicochemical treatment involving neutralization, demulsification, surfactant precipitation, and salting-out. The treated water was passed through primary screening using waste glass and ceramic materials, followed by a 20–50 µm industrial bag filter. The reclaimed water quality and quantity were monitored using a mobile-based prototype application displaying TDS and water level.

Outcome

- Produced clear, turbidity-free, odorless reclaimed water without suspended solids, surfactants, and hardness-causing contaminants.
- SWW–ROWW treatment achieved better water quality with lower TDS (731 ppm).
- Generated water suitable for non-potable applications.
- Created a working prototype Mobile application to monitor every processes.

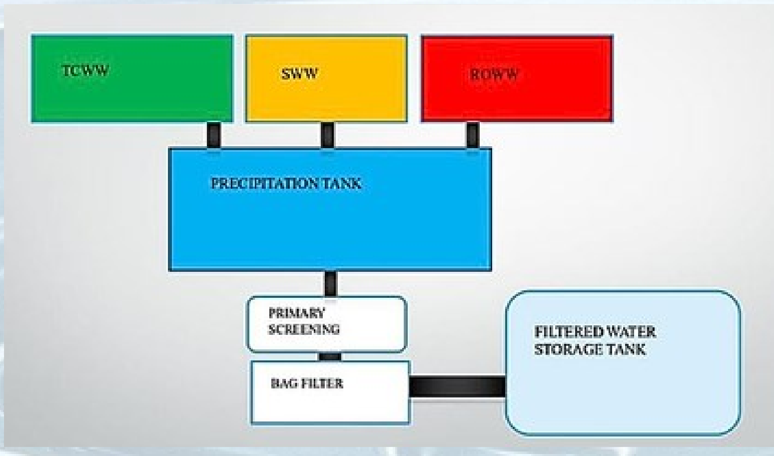
Conclusion

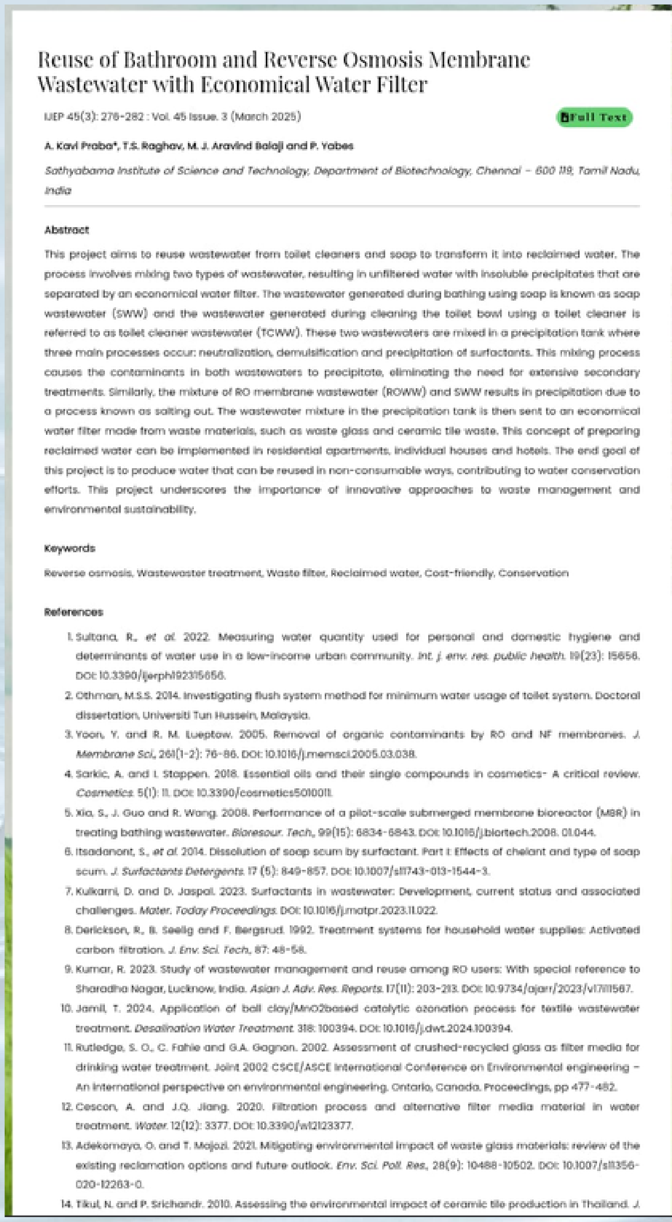
- Developed an efficient, low-cost, and simple processing sustainable wastewater reclamation system in automated format using integration of sensors
- Reduced dependence on energy-intensive and expensive biological treatment methods.
- Promoted water conservation and sustainable urban and rural water management.

- The project has been peer-reviewed and published in the Indian Journal of Environmental Protection.

Implementation

This project can be implemented for activities such as toilet flushing, floor cleaning, vehicle washing. Used for Garden and landscape irrigation. Situated at Residential apartments, individual households, and small commercial establishments. Mobile-based monitoring system for real-time water quality and storage management.





Reuse of Bathroom and Reverse Osmosis Membrane Wastewater with Economical Water Filter

IJEP 45(3): 276-282 : Vol. 45 Issue. 3 (March 2025)

Full Text

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Abstract

This project aims to reuse wastewater from toilet cleaners and soap to transform it into reclaimed water. The process involves mixing two types of wastewater, resulting in unfiltered water with insoluble precipitates that are separated by an economical water filter. The wastewater generated during bathing using soap is known as soap wastewater (SWW) and the wastewater generated during cleaning the toilet bowl using a toilet cleaner is referred to as toilet cleaner wastewater (TCWW). These two wastewaters are mixed in a precipitation tank where three main processes occur: neutralization, demulsification and precipitation of surfactants. This mixing process causes the contaminants in both wastewaters to precipitate, eliminating the need for extensive secondary treatments. Similarly, the mixture of RO membrane wastewater (ROWW) and SWW results in precipitation due to a process known as salting out. The wastewater mixture in the precipitation tank is then sent to an economical water filter made from waste materials, such as waste glass and ceramic tile waste. This concept of preparing reclaimed water can be implemented in residential apartments, individual houses and hotels. The end goal of this project is to produce water that can be reused in non-consumable ways, contributing to water conservation efforts. This project underscores the importance of innovative approaches to waste management and environmental sustainability.

Keywords

Reverse osmosis, Wastewaster treatment, Waste filter, Reclaimed water, Cost-friendly, Conservation

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Kayalvizhi.G
Student, Ph.D. (Agri.) Agronomy
Annamalai University

Project Title

Sustainable Vertical Farming for high efficiency crop production in Cauvery delta zone

Objectives

To develop a sustainable vertical farming system for the Cauvery Delta region that improves water and nutrient use efficiency, enhances crop productivity, promotes crop diversification and ensures year-round production of high-value crops under controlled environmental conditions

Methodology

A multi-layer vertical farming system will be established using hydroponic cultivation under a controlled environment. Crops will be grown in stacked cultivation units with automated irrigation and nutrient delivery. LED grow lights will supplement natural light whenever required. Temperature, humidity, pH, and electrical conductivity (EC) of the nutrient solution will be continuously monitored and maintained at optimum levels using smart sensors. Rainwater harvesting and solar energy integration may also be incorporated to improve overall sustainability.

Outcome

- Increased crop yield per unit area through vertical space utilization.
- Water savings of up to 90–95% compared with conventional farming.
- Higher nutrient use efficiency with minimal fertilizer wastage.
- Year-round production of fresh vegetables irrespective of seasonal variations.
- Reduced pesticide usage due to controlled cultivation conditions.
- Enhanced food security and sustainable production in the Cauvery Delta Zone.

IMPLEMENTATION PLAN

- Urban and peri-urban vegetable production.
- Commercial production of leafy vegetables, herbs and high-value crops.
- Educational and research institutions.
- Rooftop and indoor farming systems.
- Smart agriculture and climate-resilient farming initiatives.

CONCLUSION

The proposed vertical farming system provides a sustainable solution to the challenges of land scarcity, water shortage, climate variability and declining agricultural productivity in the Cauvery Delta Zone. Integration of precision nutrient management with controlled environment agriculture improves crop productivity while conserving natural resources and reducing environmental impacts

Divyanshu Singh

M.Tech (Soil and Water Conservation Engineering)

ICAR – Indian Agricultural Research Institute ,

New Delhi

Project Title

Geospatial Assessment and Management of Flash Floods in Chamba District of Himachal Pradesh

Objective

Development of Flash Flood Susceptibility and Zonation Maps and recommendation of Soil and Water Conservation Measures

Method

Multi-source geospatial datasets, including DEM, Landsat imagery, soil moisture, rainfall, and boundary data, will be collected from USGS, NASA, IMD, and FAO. Thematic layers such as elevation, slope, aspect, curvature, drainage, rainfall, relative relief, and NDVI will be generated using ArcGIS. Each thematic layer will be assigned risk values and weighted using the Analytical Hierarchy Process (AHP). Finally, GIS-based weighted overlay analysis will be performed to prepare the flash flood susceptibility and zonation maps of the Chamba district.

The study region will be divided into high, moderate, and low risk zones according to the flash flood susceptibility analysis. To lower surface runoff, promote groundwater recharge, and stabilize slopes, zone-specific structural and non-structural soil and water conservation techniques such as check dams, contour bunds, afforestation, and better drainage planning will be advised (based on Slope, Rainfall). Integrated GIS-based planning will increase community resilience to flash flood dangers and promote sustainable watershed management.

Outcome

The AHP-based flash flood susceptibility map classified the study area into five susceptibility zones. The Low Risk class occupied the largest area (31.39%), followed by the Moderate Risk class (29.75%). High and Very High Risk zones together covered 21.97% of the study area, indicating that nearly one-fourth of the district is highly susceptible to flash floods and requires priority soil and water conservation measures.

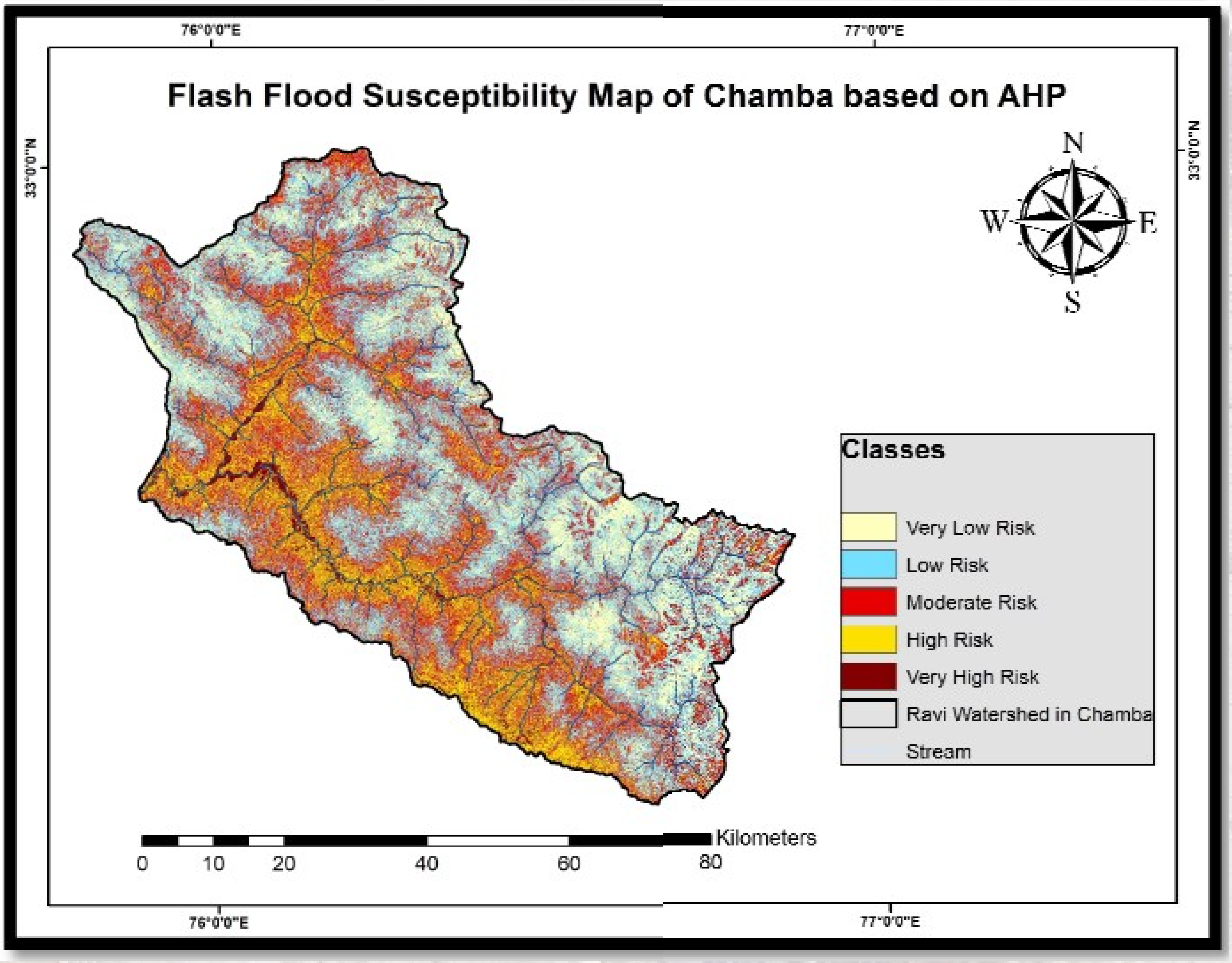
Based on the flash flood susceptibility zonation, suitable structural measures such as check dams, gabion walls, retaining walls, contour bunds, contour trenches, drainage channels, embankments, and slope stabilization structures, along with non-structural measures including afforestation, land-use planning and watershed management, will be recommended for different risk zones. These measures will help reduce flash flood risk, control soil erosion, improve watershed management, and enhance the resilience of the Ravi River catchment.

Conclusion

The current study uses integrated geospatial methodologies to evaluate the Chamba district's vulnerability to flash floods. The study will produce flash flood susceptibility and zonation maps that categorize the region into several risk groups by examining topographical, hydrological, meteorological, and land use characteristics. These findings will offer a scientific foundation for locating susceptible areas and suggesting appropriate water and soil conservation strategies. In order to increase flash flood mitigation and community resilience in the Himalayan region, the project will assist disaster risk reduction, sustainable watershed management, and climate-resilient planning.

Implementation

The flash flood susceptibility maps generated in this study will help disaster management authorities identify vulnerable areas and prioritize mitigation measures. The results can be used for watershed management, land-use planning, infrastructure development, and implementation of suitable soil and water conservation practices. The study will also support flood preparedness, early warning, and climate-resilient planning in the Chamba district.



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