

P-1 WATER EROSION APPRAISAL IN DIFFERENT AGRO-ECOLOGICAL REGIONS

1.1 INVENTORY AND DATABASE OF EROSION STATUS USING MODERN TOOLS AND PROCEDURES

1. Assessment of soil erosion fluxes of Uttarakhand.
2. An evaluation of the potential to use the Fallout Radionuclide (FRN) Caesium – 137 (^{137}Cs) in national scale soil erosion assessment in India.
3. Impact of land use land cover changes on soil erosion susceptibility in Bundelkhand region using Remote Sensing and GIS technique.
4. Regionalization of erosivity density and identification of hot-spot of erosion risk under different agro-ecological regions of India.

1.2 SOIL EROSION PROCESS MODELING AND CLIMATE CHANGE STUDIES

5. National Mission on Sustaining Himalayan Eco-system (NMSHE) - Task force on Himalayan agriculture for lower and middle Himalayan region.
6. Comprehensive assessment of climate change implication on watershed development component of PMKSY (WDC-PMKSY).
7. Assessment of potential soil erosion of India using spatial science tools.
8. Study of atmospheric and soil carbon dioxide fluxes in temperate mountainous ecosystem of western ghats with reference to climate change impact assessment.

1.3 SOIL CARBON DYNAMICS AND EROSION PRODUCTIVITY STUDIES

9. Erosion productivity relationships for evaluating vulnerability and resiliency of soils under different agro-climatic regions of India.
10. Assessment of soil organic carbon in transit under erosion processes: A source or sink for atmospheric CO_2 .
11. Environmental tracer based study on erosion induced loss of soil organic carbon and its impact on agronomic productivity and environmental quality.
12. Development and validation of a spatially explicit simulation framework to quantify runoff-erosion-carbon flux at watershed scale.
13. Assessing the vegetation and SOC recovery potentials of abandoned / fallowed shifting cultivated sites in Central Eastern Ghats.
14. Land use effect on soil carbon stock and soil quality in Mahi ravine ecosystem of semi-arid tropics.

P-2 CONSERVATION MEASURES FOR SUSTAINABLE PRODUCTION SYSTEM

2.1 RESOURCE CONSERVATION MEASURES FOR ARABLE LANDS

15. Development of conservation agriculture practices for rainfed production systems in North-western Himalayan region.
16. Evaluation of conservation tillage based *Arundo donax* mats for resource conservation and enhancing cropping intensity on sloping crop lands.

17. Determining resource conservation potential of bio-degradable waste and their on-farm utilization to increase crop productivity and profitability.
18. Utilization of different industrially derived waste along with *Arbuscular Mycorrhizal Fungi* (AMF) for sustainable soil management.
19. Effect of varying water regimes on Zn and N dynamics and rice productivity in saline vertisols.
20. Efficient utilization of fruit / vegetable waste (FVW) for improving soil health and productivity of organic agri-oleri system.
21. *In situ* moisture conservation practices under aonla based agro-forestry system for sustainable production in red soils of Bundelkhand.
22. Restoration of shifting cultivated lands for resource conservation and sustainable production in Eastern Ghats.
23. *Jhola kundi* based vegetable farming with soil moisture conservation practices for increasing profitability of tribal farmers of Eastern Ghats High Land region.
24. Evaluation of catchment-storage-command area relationship for improving rainwater productivity under integrated production systems.
25. Conservation tillage systems for enhancing productivity and resource use efficiency under rainfed area of South-eastern Rajasthan.
26. Resource conservation and productivity enhancement through organic and inorganic amendments in soyabean- mustard cropping systems.
27. Cover crops and reduced tillage for enhancing productivity and soil health in rainfed farming system in the hilly areas.

2.2 RESOURCE CONSERVATION MEASURES FOR NON-ARABLE LANDS

28. Improvisation of soil working techniques for enhancing tree establishment under rainfed conditions of North-Western Himalayas.
29. Evaluation of traditional minor millet based agro-forestry systems under recommended agri-silvicultural practices of North-Western Himalayas.
30. Development and characterization of quality planting material of important MPT's for degraded lands of North-West Himalayas.
31. Evaluation of *Bael* and Olive based agro-forestry system with soil amendments in Doon Valley.
32. Soil fertility restoration and carbon sequestration potential of multipurpose trees for agro-forestry system in Himalayan foothills.
33. Evaluation of rooting media and rootstocks of major sub-tropical fruits spp. for raising quality planting materials on degraded lands.
34. Promotion and expansion of Lemon grass (*Cymbopogon flexuosus*) cultivation as an alternative crop for livelihood security in SC and ST communities in Dehradun district.
35. Upscaling research assessment of productivity, hydrological behaviour, resource conservation and intangible benefits of selected commercial bamboo species in Uttarakhand.
36. Assessment and improvement of nutritional quality of horticultural crops on sloping lands in North-west Himalayas.
37. Improving out-planting success of various multipurpose tree species in Yamuna ravines using improved planting stock and bio-fertilizers.
38. Phyto-rehabilitation of saline - sodic vertisols through *Prosopis juliflora* based silvipastoral system.
39. Regulated deficit irrigation and canopy architecture management for fig (*Ficus carica L.*) in semi-arid vertisols.
40. Evaluation of promising fruit species with different moisture conservation practices in red soils of Bundelkhand region.
41. Evaluation of cover crops under cashew and mango plantation for improving soil health and productivity in Eastern Ghats High Land Region of Odisha.
42. Evaluation, characterization and development of elite genotypes of *Cassia auriculata* for cultivation in semi- arid regions.
43. Resource utilization and productivity of Dragon fruit based horti-silviculture system under rainfed agro eco- systems of Central Gujarat.

P-3 WATERSHED HYDROLOGY FOR CONSERVATION PLANNING

3.1 HYDROLOGICAL BEHAVIOUR OF LAND USES AND MANAGEMENT PRACTICES

44. Hydrologic systems analysis across multiple spatial scales and its implications on hydro-logic processes in sub-humid catchment of Eastern Ghat High Land Region of Odisha.

3.2 WATER HARVESTING, GROUNDWATER RECHARGE AND MANAGEMENT

45. Development and rejuvenation of natural springs through soil and water conservation measures.
46. Consortia Research Platform-Water Theme 1 Water Resources Augmentation/ Conservation.
47. Quantitative and qualitative assessment and management strategy for the sustainable development of the groundwater resources in Haridwar district.
48. Employing system approach on zero energy drip irrigation system in bench terrace farming for hill region.
49. Efficient groundwater management for enhancing adaptive capacity to climate change in sugarcane based farming systems in Muzaffarnagar district, U.P.
50. Water quality assessment and its impact on adjacent soil and vegetation in riparian areas of Hindon and Kali rivers.
51. Study on pollution status of Yamuna river and its impact on soil and crop health in Western U.P.
52. Evaluation of direct recharge filter for revival of defunct and low yielding borewell vis-a-vis augmentation of ground water table in semi-arid region of Karnataka.
53. Estimation of water budget components for predominant land uses of south-eastern Rajasthan for conservation planning.
54. Strategies for rainwater harvesting and its multiple uses in rainfed agriculture in Central Gujarat.
55. Field evaluation of ground water recharge filters developed by ICAR-IISWC, Vasad.
56. Design and evaluation of HDPE sheet embedded gabion check dams for water harvesting in North West Himalayas.

P-4 REHABILITATION OF AREAS AFFECTED BY MASS EROSION

4.1 DEVELOPMENT AND REFINEMENT OF TECHNOLOGIES FOR REHABILITATION OF RAVINES, LANDSLIDES, MINE SPOILS, RIVERBED MINING, STREAM BANKS, TORRENTS ETC.

57. Ecological restoration of stone mine spoil area in south-eastern Rajasthan.
58. Field evaluation of refinement of ravine reclamation technology in a model ravine area development project at Lohli-Bagli village in district Bundi (Rajasthan).
59. Field evaluation of design of trenches under different agro-climatic regions.
60. Enhancing productivity of ravine lands by plantation of *A. sapota* with intercropping systems.

P-5 INTEGRATED WATERSHED MANAGEMENT FOR SOCIO-ECONOMIC GROWTH AND POLICY ADVOCACY

5.1 PARTICIPATORY WATERSHED MANAGEMENT AND INTEGRATED FARMING SYSTEM (IFS)

61. Evaluation of criteria and techniques for classification of fisheries - sensitive watersheds for conservation and production management.
62. Socio-economic analysis of farming/livelihood systems of farmers across different land categories in Yamuna ravine area.
63. Refining methodologies for data validation, planning, monitoring and evaluation of watersheds.
64. Economic impact assessment of water harvesting structure-Farm Pond in the semi-arid regions of Karnataka.
65. Valuation of ecosystem services from natural resource conservation and management interventions in different agro-ecological regions in India.

P-6 HUMAN RESOURCE DEVELOPMENT AND TECHNOLOGY TRANSFER

6.1 CAPACITY DEVELOPMENT APPROACHES AND INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

66. Developing ICT based e- learning tools for conservation measures and watershed management.
67. Exploring the potential of mKRISHI to disseminate the knowledge about soil and water conservation technologies to the stakeholders: An innovative approach to reach the unreached.

6.2 PARTICIPATORY TECHNOLOGY DISSEMINATION AND ADOPTION

68. Assessing farmers knowledge, vulnerability and adapting capacity of soil and water conservation technologies under changing climatic scenario.
69. Assessment of sustainability factors for soil and water conservation projects.
70. Farmer participatory technology application for sustainable resource management and livelihood security in North-west Himalayas.
71. Role of women in conservation and management of natural water resources for domestic and irrigation uses.
72. Determination of heterogeneity in agro-forestry practices and acceptability alongwith altitude gradient in Western Himalayas.
73. Documentation and validation of ITKs in soil and water conservation practiced by tribal farmers of Tamil Nadu.