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IN THIS ISSUE

International Decade of Soils 2015-2024

FROM THE PRESIDENT'S DESK

With a global population that is projected to exceed 9 billion by 2050, compounded by competition for land and water resources and the impact of climate change, our current and future food security hinges on our ability to increase yields and food quality using the soils that are already under production today. Food availability relies on soils - nutritious and good quality food and animal fodder can only be produced if our soils are healthy living soils. Over the last 50 years, advances in agricultural technology and increased demand due to a growing population have put our soils under increasing pressure. In many countries, intensive crop production has depleted the soil, jeopardizing the soils productive capacity and ability to meet the needs of future generations. Holistic production management systems that promote and enhance agro-ecosystem health that are socially, ecologically and economically sustainable are necessary in order to protect our soils while maintaining high productive capacities. Farmers play a central role in this aspect. Numerous and diverse farming approaches promote the sustainable management of soils with the goal of improving productivity, for instance: agroecology, conservation agriculture, organic farming or low budget farming, zero tillage farming and agroforestry. Ultimately, a better understanding of the linkages between soil life and ecosystem function and the impact of human interventions will enable the reduction of negative impacts and allow to capture the benefits of soil biological activity more effectively for a more sustainable and productive agriculture. Soil nutrient loss is a major soil degradation processes threatening nutrition and is recognized as being among the most important problems at a global level for food security and sustainability all around the globe. World Soil Day 2022 and its campaign "**Soils: Where food begins**" aims to raise awareness of the importance of maintaining healthy ecosystems and human well-being by addressing the growing challenges in soil management, increasing soil awareness and encouraging societies to improve soil health. The FAO commemorates the observance by organizing several events to improve soil governance to guarantee productive soils towards food security, climate change adaptation and mitigation, and sustainable development for all.

Dr. Suraj Bhan
President SCSI

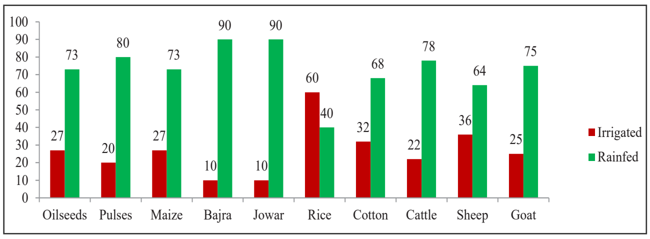
Sustainable Agriculture in Rainfed Eco-system

Bisweswar Rath

1. Importance of Rainfed Agriculture

Currently, rainfed agriculture accounts for about 52 per cent of the net sown area and about 60 per cent of India's farmer population. Rainfed agriculture is crucial to the country's economy and food security. Presently, it contributes towards 40 per cent of the total food grain production (85, 83, 70 and 65 per cent of nutri-cereals, pulses, oilseeds and cotton, respectively); and supports two-thirds of livestock. Further, this ecosystem provides the livelihoods of 80 per cent of small and marginal farmers. Crop diversity in rainfed regions is quite broad with almost 34 major crops grown compared to that of irrigated areas which caters to mainly 4 to 5 major crops. Rainfed farmers follow a diverse portfolio of economic activities including horticulture, agroforestry, spices, medicinal & aromatic plants, fishery, livestock and beekeeping etc,. The vast range of production system in rainfed areas has the potential to diversify the consumption plates necessary to address concerns of malnutrition. Rainfed agriculture is practiced under a wide range of soil types, agro-climates, topography and rainfall conditions ranging from 400 mm to more than 5000 mm per annum.

Fig 1. Contribution of Rainfed Agriculture in various agri-commodities



2. Issues & challenges of rainfed agriculture

The rainfed regions suffer from a number of biophysical and socio-economic constraints. Predominant among those are water-scarcity, fragile environments, low economic returns. These unfavorable conditions results in low productivity, low cropping intensity, high cost of cultivation, poor adoption of modern technology, uncertainty in output and high incidence of rural poverty. Some of the major factors that have aggravated these challenges are climate risks, lack of dedicated strategy, inadequate investment, lack of exclusive technologies, poor infrastructure including market linkages and non availability of reliable data in central database systems etc.

3. Dominance of Irrigated Agriculture over rainfed agriculture

Rainfed agriculture contributes around 60 per cent of the value of agriculture GDP of India, but still it witnesses a serious policy bias, when it comes to public investment and policy support. Considering some of the major direct and indirect investments inclined predominantly for irrigated agriculture compared to that of rainfed areas, it is observed that the later gets hardly one third of the support. This also is reflected in the productivity, which is about 1 MT/Ha in rainfed areas, where as it is more than 3 MT/ha in case of irrigated areas. Similarly average farm income for families in rainfed agriculture dominated districts is less than one fifth of their counterpart in irrigation predominant districts.

4. Need for game changing policy in Rainfed Agriculture

The biggest policy shift that is needed in favor of rainfed agriculture is moving away from the present agricultural paradigm of piecemeal interventions to comprehensive treatment for strengthening the agro-ecosystem holistically. Experience has shown that the current agricultural paradigm has only hastened the degradation of production systems in rainfed areas leading to diminished returns on investment and inadequate average incomes. Policies and programmes for rainfed agriculture should adopt a different paradigm, one that measures success in terms of inclusive and sustainable growth with regards to system-based alternative output in contrast to season-based productivity. The guiding elements needed are nutrition for the consumers, income for the farmers and health of the eco-system. It is important to promote resilience of the diverse production systems that define rainfed agro-ecosystems and not merely in terms of productivity. Some of the important policy re-orientation required in the rainfed production system are outlined below.

Prioritization of Rainfed districts: The "Everything Everywhere" approach of taking up all major interventions uniformly across all regions of the country is not favourable for rainfed areas. A dedicated and targeted approach is necessary to prioritised rainfed districts for potential and effective use of the available resources in a phased approach for adequate investment towards comprehensive development. The National Rainfed Area Authority (NRAA), through a comprehensive study ranked all the agriculture dominated 670 districts based on vulnerability under Natural Resource Index(NRI), Integrated Livelihood Index(ILI) and Composite Index(CI). 168 districts (comprising 25 per cent of districts under Study) based

Major sustainability issues in Rainfed agriculture			
Project design barriers	Technology barriers	Economic and financial barriers	Institutional barriers
• Inadequate information & database • Variability in norms among programmes • Rigidity in project design preventing flexibility in implementation	• Promotion of technologies designed primarily for irrigated production system • Lack of availability of exclusive tools, inputs & equipments • Lack of local capacity and experience	• Inadequate infrastructure, investment and financial support • Imbalanced policy environment, such as MSP & procurement	• Lack of coordination & collaboration • Procedural rigidness • Small land holdings & insecure land tenure arrangements • low awareness on climatic challenges & adaptation measures • Agriculture is a state subject • Primarily Rice & Wheat based PDS

on composite score have been identified as 'high priority' rainfed districts for interventions, that will enhance natural resources and livelihood outcomes. These 168 districts should be considered as priority districts by various Ministries & Departments, and agencies under them for intervening with programs & policies.

Drought Proofing Action Plans (DPAP): There is need for the adoption of comprehensive drought-proofing technologies that are in alignment with the agro-ecologies. Further, both central and state governments need to pool their resources and strategies in a comprehensive manner rather than a silo approach. The Drought Proofing Action Plans (DPAPs) are the proposed blue print for drought proofing of most vulnerable districts over a period of 5 years. The key objectives of DPAPs are to enhance the ability of the farming system to cope with expected climate-variations more effectively by adopting resilient technologies and practices. With support of State Agriculture Departments, NRAA is engaged in developing drought proofing strategies for the most vulnerable rainfed districts. These plans should be up-scaled to enhance the prosperity, development and inclusiveness of farmers in rainfed areas on sustainable basis.

New Generation Watershed Development – Shift in Approach: The fundamental shift in existing approaches of watershed development programmes needs to be re-oriented. In the new generation watershed development guidelines, a clear transition from the current predominant practice of mechanical / engineering treatments to more agriculture engineering measures is emphasized. This implies overwhelming focus on trees, cropping systems, soil moisture conservation & management and soil organic matter. More emphasis is also laid on effective use of rain water, crop diversification, risk management plans, economically vibrant institutions, Setting up and nurturing of community groups and rejuvenation of springsheds etc.

Differentiated rainfed water policy: The national water policy need to be reoriented from demand side management to addressing the inherent synergies and trade-offs that define the Nexus. A progressive movement towards equitable access to water, at least during droughts to meet contingencies for small and marginal farmers should be ensured. Gram Panchayat should be empowered in decision making and participatory governance of water resources. Further, adoption of a 'Water Stewardship' approach and practices can sensitise the communities and build a local 'water stewards'. The policy of ground water use in rainfed areas should clearly aim at equitable use and for enhancing the water productivity and supplementing rainfall deficits. The water markets and water sharing mechanism may be established for efficient use of water resources.

Incentivization: Rainfed farmers should get priority in accessing benefits of Govt. programmes, higher subsidy for agricultural inputs, interest free credit support, coverage under crop insurance at lowest premiums etc. Considering poor economic condition of rainfed farmers, the water centric interventions should be treated as basic amenities with higher subsidy. Creation of infrastructure for storage, market facility, value addition etc. for crops having higher water productivity should be promoted.

Knowledge & Information Support: A data repository on rainfall, production, soil health & moisture, crop water requirement, good agricultural practices, water bodies, market & price information, groundwater (both historical and in season) etc. should be established. This will enable local level decision making and participatory governance of water resources. A special task force should be established to examine the challenges of rainfed agriculture and bringing out a policy document for rainfed agriculture.

Policy Support: A policy of common planning and reporting support should include convergence & synergy among programmes, mandatory micro irrigation system for all irrigation tube wells, discouraging the farmers from growing water intensive crops, labelling of water foot print on agri-commodities, legislation of land leasing, contract farming, and land sharing etc.

Sustainable Land and Soil Management: It is important to adopt suitable soil conservation measures based on land capability classes, and landscape planning approach. Farming practices like conservation tillage, mulch farming, cover crop, mixed farming/cropping, agroforestry, ley farming, use of organic manures are ways to increase soil organic carbon and carbon sequestration.

Strengthen Extension Services: The extension functionaries should be re-oriented and trained to serve various agro-ecologies adequately in rainfed regions. The gap in the ratio between extension functionaries to farmers needs to be bridged. Extension workers/technical functionaries should be trained on the latest advances in rainfed agriculture technologies and on sustainable practices for adopting resilient cropping systems and improving productivity. Model/ Adarsh watersheds are key for scaling up successful watershed approaches. The model watersheds should be intended to demonstrate successful watershed management approaches and serve as 'Pilot Replicable Watersheds' at district scale.

Improve system productivity: Increasing demand for food and processed commodities with a faster demand for high-value commodities (such as horticulture, herbal & medicinal, dairy, livestock, and fish) will require a shift from season-centric productivity enhancement to system- production through a holistic research and development approach. Research needs to be undertaken for varieties with high yield potential, drought tolerance, high response to nutrient supply, high water use efficiency, and moderate resistance to pests and diseases. Establishment of crop zones by targeting revenue boundaries like blocks/sub-divisions for better alignment of crops and agricultural practices in synch with the available local resources, rainfall, soil resources, and other agro-ecological characteristics of the area, in turn will improve the resource efficiency and production potential. Low cost protected cultivation (greenhouses, shade-net house, tunnels and plant protection nets) that grow plants in protected environments to regulate climatic conditions deserve to be up-scaled in rainfed regions to protect crops and improve yields.

Establishing bio-economy through secondary agricultural activities: Secondary agriculture is a strategic intervention for rainfed area to process both primary and by-products of the agriculture sector into value added products and thereby create gainful employment and supplementary income for the farmers. It can also serve as a mitigation mechanism during periods of extreme weather events, crop losses, and price volatility of agricultural produce. The strategies can be adopted to boost secondary agricultural activities in rainfed regions are value addition of primary agricultural produce, promotion of alternative enterprises (beekeeping, sericulture, organic/indigenous seed production, biochar, bio pelletisation etc.), and income generation activities through agricultural residues/wastes (vermicomposting, organic manure, bio-pesticides, and fiber products etc.)

Cooperative/group movement: Poor market linkages and lack of rainfed farmers' ability to negotiate market prices call for enhancing their capacity to capture the value of the product through strategies that include aggregating farm and economic activities in clusters, setting up of dedicated FPOs in each cluster, setting up rural-based low-cost small-scale agro-industries, creation of multi-purpose low-cost rural-based agro-processing complexes/parks, establishment of decentralized aggregation and market platforms to facilitate marketing of surpluses in close proximity to farm gates etc.

Dynamic Data Portal and Decision Support Tools: Developing a dynamic data portal for rainfed regions to enable decision making and to improve transparency and accountability is crucial. This will enable better risk mitigation, customized solutions, and course corrections for region-specific climate and related risks. In this context, scaling up the 'Unified Farmer Service Platform (UFSP)' and development of a centralized database on rainfed agriculture - Rainfed Areas Data Repository (RADAR) can act as a central agency and repository in the agri-data ecosystem will bring a paradigm shift in data-based decision making.

Co-Benefits of a smart water saving practice in rice: Alternate wetting and drying irrigation system

Asheesh Chaurasiya, Garima Singh, S K Dutta, Sanjay Kumar, Anshuman Kohli, and Y K Singh

Rice cultivation has reached 167 million hectares (mha) and it occupies 30% of the world's irrigated cropland. It is usually grown under continuous flooding situation which is favorable for rice production and gives advantage over weed infestation. However, huge water requirement under prevailing water scarcity condition and methane emission from submerged paddy fields threatens the productivity of irrigated rice. Many literatures have affirmed that continuous flooding may not be necessary to achieve high yield for rice as after the seedling establishment stage plants can extract soil water from root zone. Therefore, aerobic cultivation of rice same as wheat and maize under irrigated condition can be followed by adopting Alternate Wetting and Drying (AWD) irrigation system. This innovative irrigation system allows the lowland rice growers to save water by intermittent irrigation by alternatively flooding and drying the field at certain days interval which may vary from 1-10 or more days depending on the soil type. AWD irrigation system requires 23–33% less water as compared to continuous flood irrigation thereby improving the water use efficiency (WUE), it reduces the anthropogenic GHGs emission by 45–90% while maintaining the grain yield. This system has shown to improve the grain quality by reducing total Arsenic (by 50%) and has been effective in decreasing insect pests (92%) and disease (100%) infestation. So, here we will describe about AWD Irrigation in brief;

Implementation of AWD irrigation system

1. **Making the field water tube or pani pipe**
   - Plastic (PVC) pipes or bamboo can be used
   - PVC pipes of 35cm and bamboo 30cm length and 10-15cm dia. for water level inside pipe to be visible.
   - Holes of 0.5cm size at 2cm spacing on all sides of the lower 15-20cm length of the pipe should be made with the help of drill machine as shown in figure 1.
2. **Establishment of field water tube**
   - The water tubes should be established at an easily approachable place, 1-1.5m away from bund for monitoring at a location representative of the average water depth in the field (no high or low spot).
   - Bury 20cm of the tube inside the soil and leave 10cm above soil surface; remove the soil from inside the tube so that the bottom of the tube is visible. Check whether level of water inside the tube and on the field is the same.
3. **Monitoring of alternate wetting and drying (AWD) irrigation system**
   - AWD can be started 2 weeks after transplanting. If the weeds are more in the field, AWD is delayed for 2-3 weeks until the weeds are suppressed by the ponded water.
   - Depth of water level in the water tube is monitored after surface water dries (**fig. 1**).
   - Presence of water inside water tube after soil surface drying indicates water availability in the root zone; therefore, no need for irrigation.
   - Drop in the water level of water tube by 15-20cm below the surface of soil indicates the need for irrigation; field re-flooded with 5cm ponded water. This is referred to as Safe AWD (**fig. 2**).
   - To avoid water stress and prevent yield loss at the flowering stage (critical stage for water stress) 5cm deep ponded water above soil surface should be kept from a week before to a week after floweing.
   - During grain filling and ripening stage 15cm drop in water level of the water tube is allowable before flooding (Safe AWD).
   - Safe AWD saves 15-25% water with no yield penalty. Allowable dop in water depth cn vary from 15 to

Figure 1. Perforated PVC pipe or water tube (A) and sketch of water tube (B)

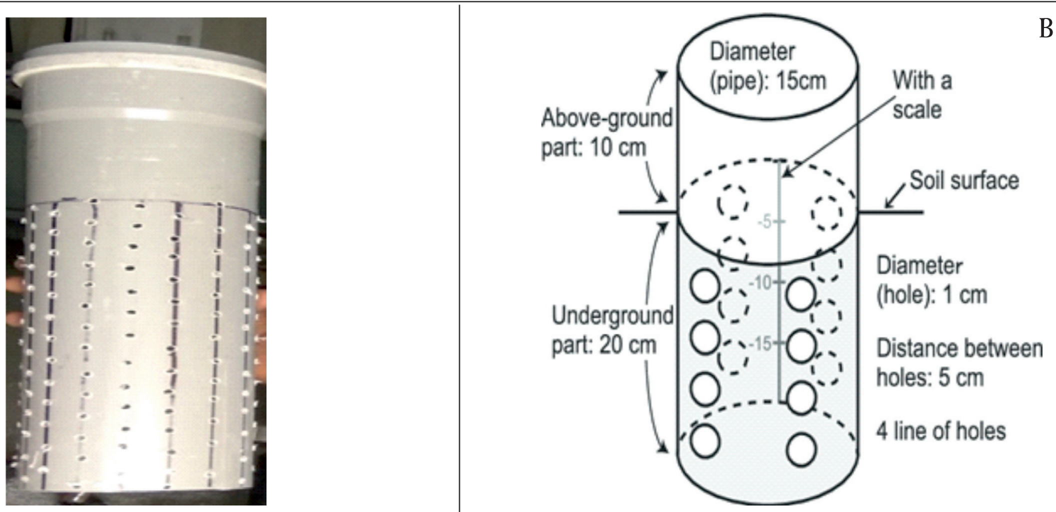


Figure 2. Establishing perforated water pipe (C) and implemented water pipe in field (D)

210cm or even 25cm below soil surface depending on soil type.

Benefits of AWD Irrigation system

- No yield loss when safe AWD system was followed (15-20cm drop in water level in filed water tube). If AWD is followed correctly it may increase the yield under certain conditions.
- Less disease and pest infestation in the rice crop grown under the AWD irrigation system as the crop becomes hardy and resistant to disease and pest incidence. Reduced humidity in the crop canopy also favours less pests and diseases.
- AWD irrigation system increases the rooting depth and density of rice plant which improves the nutrient and water uptake and drought and lodging resistance.
- Improvement in soil structure and oxygenation in the root zone with AWD positively affect effective tiller development, grain size, and quality resulting in increased yield.
- AWD system improves soil fertility status by enhancing the availability of nitrogen and zinc; exchange of air (oxygen) between atmosphere and soil under AWD practice mineralization of soil organic matter and inhibited soil N immobilization.
- Non-point pollution of nutrients by runoff and leaching losses is reduced under AWD irrigation system.
- AWD enables the recycling of organic nutrients for subsequent crops, which are frequently locked up in submerged soils.
- Decreased flood irrigation in AWD improves soil structure for upland crops following rice due to increased soil aggregation and macro porosity.
- It also saves money on pumping as less water is used (saves 1-2 irrigation) which may be one of the main reasons for increased farm profitability.
- AWD system allows farmers to adapt to the changing climate situation triggering water scarcity.
- Zinc deficiency in rice prevailing in the Southeast Asian countries is reduced under AWD irrigation system as it increases grain zinc content. Aerobic conditions reduce the availability of arsenic and mercury to plants which are heavy metal contaminants of soil.
- AWD also enhances the straw breakdown and the capacity to integrate residue without interfering with field preparation.

Conclusion

Alternate wetting and drying irrigation system is an efficient strategy for saving irrigation water as well as enhancing rice yields in the future. However, under growing water limitations, there still lies need to enhance land and water productivity through using different tools of efficient irrigation systems and crop rotation. AWD has various advantages over continuous flooding as it enhances the rice production as well as environmental and human health, in addition to the fundamental advantages (lower emissions, water consumption, and pump costs). Climate, soil type, pests, rotation type, and irrigation availability will all have to be considered while using AWD strategy for reaping its maximum benefits.

Extent of Hill Landslide, Slips, its Menace and Management

Prafulla Kumar Mandal and Dr. Dhabaleswar Konar

About 0.42 million km2 of hills covering nearly 12.6% of land area of India is vulnerable to Landslide and Landslips. Landslip is the slip of a large mass of rock material, gravel, pebble soil, etc, down the side slope of a mountain or cliff . Landslide involves the breakup and downhill flow of rock, mud, water and anything.

Number and frequency in Mountainous region of the North-Western Himalayas (NWH), the Sub-Himalayan Terrain (SHT) of the North-East (NE), Hill Ranges of Western and Eastern Ghats (W&EG) are mainly because of the geological, geo-morphological, hydrological, faulty land use, faulty quarry, climatic, anthropogenic factors. active tectonics, fragile geology, high relief, steep slopes, intense rainfall, earthquake. Out of this, in NEH including Darjeeling and Sikkim 0.18 million km2, NWH 0.14 million km2, in WG 0.09 million km2 and in EG 0.01 million km2. River system of Asia, namely Indus, Sutlej, Ganges and Brahmaputra and its many tributaries originate, average annually feed of these 3 river basins in Indian territory alone estimated to be 1009 billion m3 and flow through these ranges. Major drainage system of the WH are Indus, Ganges, Yamuna, Jhelum, Ravi, Sutlej, Chenab, and Sharada. EH major river systems includes Tista, Brahmaputra and Irravady. These are recognised as 'Water Towers' on the Earth. More than 9579 glaciers in the Indian Himalaya covers about 38,000 km2 area. Total volume of water flows from the Himalaya complex to the plains of the Indian subcontinent, is estimated to be about 8.6 x 106 m3 per year, of which snow in the EH is about 10% and more than 60% in the WH. 1.3 billions people living in their lower commands.

While the entire Himalayan hill area generates so many vast contributions to the people, flora and fauna , also disasters vast and extensive Natural Hazards both within area and outside of it, one of the important reasons is the faulty and guilty human interference. One of the seismically active regions of the world is the Himalayan Frontal Arc. 50 km wide zone between the Main Boundary Thrust (MBT) and the Main Central Thrust (MCT). This zone is also known as the Main Himalayan Seismic Belt (MHSB)in which massive earthquakes (M>8). Owing to the Global warming, occurrence of Glacial Lake Outburst Floods (GLOF), Avalanches in high mountains happen. World's average surface temperature has increased. With its' rise by 10C, the Alpine glaciers have shrunk by 40% in area and by more than 50% in volume since 1850. Trend is in the rise. Its adverse effect is the threat of glacial lake outburst flood (GLOF).

Preventing and managing the Landslides, Slips together with torrents and flush flood are the essential responsibility. Integrated Soil Conservation through Engineering, Vegetative and Farming (Bio-engineering) measures are the only ways to prevent and manage the Landslide, Slip, torrent and flush flood generated in and from the Hills. Site specific effective technologies, if properly applied, the prevention and management become easy and possible. Some of the measures are mentioned here. Gravity retention structures, Cantilever retention structures, Retaining structures, Flexible retention structures, Surface Drainage, Subsurface drainage, Horizontal drains, Deep trench drains, Drainage well, Drainage tunnel, Hill river erosion control structures, Stabilization of landslides by vegetation. All these should and must be strengthened with live vegetative support of trees and grasses.

Some suggestions are put placed for preventive and curative measures.

1. Peoples' awareness should be intensified, that no to undertake such works and activities that may aggravate erosion, landslides, slips. Soil Conservation subject should be included in the course curriculum of Secondary (Class X) and Higher Secondary (Class XII).
2. Official functionary for the soil conservation should be created and strengthened both in Centre and in States, Union Territories.
3. In the SAU and CAU, Soil and Water Conservation Department should be established and subject Soil Conservation should be included both in UG and PG Courses.
4. Observations and Recommendation of, FAO, IPCC and PCI (NITIYI) should be given priority in action.
5. In the Hills no more Pucca Constructional works, except public utilities, conservation works and for security purpose should be done.
6. New Conservation scheme should be augmented exclusively for the Hill area.
7. Existing or wherever essential new Pucca constructions, structures, should be encircled with protective vegetative measures with low height trees and grasses cover.

8. Cantilevers of the hills, should be either removed carefully or to be protected with strengthy structures, that, landslide, slip do not occur during monsoon rains.
9. Quarries should be undertaken, surveying and taking all cares , that do not favour landslide, slip.
10. Extensive Soil Conservation works should be done both on hills and foot hills.
11. No more urbanisation, less to speak of multi-storeyed buildings.
12. Thin forests should be reforested and vacant spaces should be afforested with appropriate tree species observing conservation principles on the hill flanks and top.
13. Old Terraces should be maintained, risers should compulsorily be enforced with eye brew of the hardy bushy erect grasses.
14. Global Warming, halt, rather retardation should be ensured.
15. Burning of solid and liquid fossil fuel should be limited.
16. No heavy Industry should be established within the Hill area and considerable distance from the foot hills.
17. Crops should be selected in the category of Erosion Resisting and farming method erosion resisting. Agro-forestry models as per Land Capability Class should be adopted. Cultivation of terraces in the hill flanks should be done observing the conservation farming principles.

In case of necessity of irrigation, the sprinkler, drip and pitcher irrigation methods should be followed.

SCSI Member conferred with Best Soil and Water Conservationist Award

Dr. Sanjay Swami, Professor, School of Natural Resource Management, College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University, Barapani, Meghalaya & Chairman of the Meghalaya State Chapter of Soil Conservation Society of India has been conferred with the prestigious **Best Soil and Water Conservationist Award - 2022** of the Agricultural & Environmental Technology Development Society (AETDS), U.S. Nagar, UK, India for his outstanding contribution in the field of natural resource conservation, especially soil and water conservation in the North Eastern Himalayan region. The award was presented in the valedictory ceremony of the 4th International Conference on *"Global Efforts on Agriculture, Forestry, Environment and Food Security"* at Institute of Forestry, Tribhuvan University, Pokhra Campus, Pokhra, Nepal on 18th September 2022. The Soil Conservation Society of India, New Delhi congratulates him for the achievement.

71st SCSI Foundation Day Observed by Meghalaya State Chapter

The Meghalaya Chapter observed 'Foundation Day' of the Soil Conservation Society of India on 24th September, 2022 at School of Natural Resource Management, College of Post Graduate Studies in Agricultural Sciences, CAU, Barapani.

Dr. N. Janaki Singh, Secretary of the SCSI-Meghalaya Chapter, while welcoming the students and faculty members apprised that the Soil Conservation Society of India was first established at Hazaribagh, Bihar (now in Jharkhand) in December 1951 and later on the HQ was shifted to New Delhi. He informed that this year, they are celebrating 71st foundation day of the society today. He added that the SCSI is mandated to the welfare of farmers and all the rural people whose livelihoods are associated with the management of natural resources. It works for the cause of conservation, development, management and sustainable use of the soil, land, water and associated resources of plants and animals. The SCSI extends its activities by establishing State Chapters in various parts of the country and at present, 23 State Chapters of the SCSI are functioning including the Meghalaya State Chapter at CPGS-AS, Barapani.

Dr. Lala I.P. Ray, Associate Professor (Soil and Water Conservation) and an active member of Meghalaya Chapter during his address to the house highlighted the importance of joining the SCSI and elaborated the benefits in academic career like participation in annual conference, publication of research papers, articles, keeping in touch with recent research trend and learning about innovative approaches for sustainable management of soil and water resources.

Dr. A.K. Singh and two student members of SCSI namely Mr. Shubham Singh and Sushree Panda, Ph.D. scholars also shared their views about how they are being benefitted from the SCSI activities such as getting exposure by attending conferences, online lectures, quiz and essay competitions, and winning various awards. Mr. Shubham Singh also shared with the fellow students that recently he applied for the post of guest faculty position, and got 2 marks for being a member of SCSI as there was a provision

of marks for professional society membership. He urged the fellow students to join the SCSI team and contribute for the farmers and rural people.

Dr. Sanjay Swami, Professor (Soils) & Chairman of the SCSI-Meghalaya Chapter extended greetings to all the SCSI team members on the occasion of 71st foundation day. In his presidential remarks, he highlighted the concentrated efforts of SCSI team at national and international level in conserving the natural resources since its inception. He said that the mandate of SCSI has more relevance in hilly regions like Meghalaya as the steep slopes of hills are highly susceptible to acute soil erosion due high intensity rainfall. The primitive cultivation practices like *jhum* and *bun* further enhances the degenerative trends. Rampant deforestation, wild fires, extensive grazing, unscientific mining and quarrying, etc., are adversely affecting the overall ecological condition of the region. Control efforts have not succeeded to desired scale. He emphasized that soil conservation in hilly areas requires a well-planned and rational land use programme combined with engineering and cultural measures. Steep slopes may essentially be brought under permanent forests and gentle slopes should be terraced and valley bottom should be put under suitable agricultural crops. To achieve maximum benefit, it is essential to treat various areas on a complete watershed basis for rational use of forestry and agriculture, including horticulture.

Dr. Swami also appraised the house about various activities taken up by the Meghalaya Chapter of SCSI for improving soil and environmental health in the hilly tract of Meghalaya and shared that their efforts in this direction has been recognized by the SCSI HQ as the Meghalaya Chapter was conferred with the prestigious Best Chapter Award - 2020 among 23 state chapters of SCSI in the country last year. He added that this is the result of hard and dedicated work of all its members and I congratulate the Meghalaya Chapter team.

Many members of SCSI-Meghalaya Chapter also participated in this event. The programme ended with vote of thanks proposed by Ms. Bullo Yami, a student member of the Meghalaya Chapter.

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